



FEATURED ARTICLES

Cancer du sein pris en charge dans l'unité d'oncologie gynécologique du Centre Hospitalier Universitaire Sylvanus Olympio de 2019 à 2023

Ketevi et al

Factors associated with infertility in women less than 25 years

Nsahlai et al

Clinical, biological, morphological and histological profile of prostate cancer at the Central Hospital in Yaoundé

Fouda et al

Aspects cliniques, thérapeutiques et évolutifs de l'infertilité du couple : étude quantitative dans une zone semi-urbaine du Cameroun

Alima et al

La torsion du cordon spermatique à l'Hôpital Central de Yaoundé

Fouda et al

Facteurs de risque cardiovasculaire en milieu hospitalier du Nord-Cameroun : Etude transversale à l'Hôpital Général de Garoua

Hadja Inna et al

Determinant related to amputation and mortality among patients with diabetic foot at Yaoundé central Hospital

Ekani Boukar et al

Radical retropubic prostatectomy by laparoscopic approach versus open surgery for localized prostate cancer. Techniques and results in two Cameroonian university teaching hospitals

Mekeme et al

A rare postpartum presentation of appendiceal rupture concealed by uterine myoma : a case report

Nsahlai et al

Avoidable death from complicated epigastric hernia in a resource limited setting

Ewole Ella et al

Difficultés dans le diagnostic étiologique de la glomérulonéphrite aiguë post streptococcique chez l'enfant : à propos de 2 cas au service de pédiatrie du CHU Libreville

Minto'o et al

Surgical Management of Sciatica due to Lumbar Disc Herniation: Epidemiology, Quality of Life and Postoperative Outcome at Yaoundé Military Hospital: A Retrospective Study

Djoubairou et al

Aspects épidémiologiques, diagnostiques et thérapeutiques des cellulites cervico-faciales dans le service de Stomatologie et Chirurgie maxillo-faciale du centre hospitalier universitaire Yalgado Ouédraogo

Bazame et al

High prevalence of multidrug-resistant bacteria in diabetic foot infections: a 59 series from a district hospital in Cameroon

Ngono et al

Factors associated with academic performance in children living with epilepsy followed in a pediatric referral hospital in Cameroon

Enyama et al

Itinerary and determinants of loss to follow-up of pregnant women at the Yaoundé Gynaeco-Obstetrics and Paediatric Hospital

Nyada et al

Indications and Findings of Pediatric Chest X-Rays in a Secondary Referral Hospital in Cameroon

Dongmo Fomeong et al

Maternal Mortality Audits at the Yaoundé Teaching Hospital Center in Cameroon between 2017 and 2023: Findings and Quality Improvement Perspectives

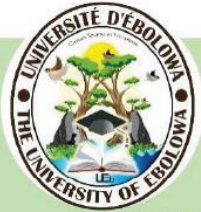
Mboua Batoum et al

Barrières à l'implémentation de la Méthode Mère Kangourou dans trois formations sanitaires de la région du centre Cameroun

Ehouzou et al

Informed consent: myth or reality in the surgical units of Yaoundé Central Hospital?

Meva'a Biouele et al



Présentation

- School of the University of Ebolowa
- Creation : Decree n°2022/009 of January 06, 2022
- Missions : Teaching, research, support for development
- Initial training in medicine and pharmacy
- Post-Graduate school

Localisation

Five actual sites :

- **Bitom, Reference Hospital of Sangmélima (RHS)** : Dean's office, Administrative offices, Classrooms
- **Bitom, behind RHS** : Departments
- **Bissono** : Administrative offices, Library, Classrooms, Laboratories
- **Nkolnguét, Inter-States University** : 1 office, 1 classroom
- **Mbeli'l, ENIEG of Sangmélima** : 4 classrooms

Ours Fields

Initial training GENERAL MEDICINE

- Acceptance profile : GCE Advanced level in chemistry and biology / Baccalauréat d'enseignement général C ou D
- Training Duration : 7 years
- Obtained degree : Doctorate in general medicine
- Job opportunities : Medical doctor, Basic de courses (specialization, research...), Teaching

Initial training PHARMACY

- Acceptance profile : GCE Advanced level in chemistry and biology/ Baccalauréat d'enseignement général C ou D
- Training duration : 7 years
- Obtained degree : Doctorate in pharmacy
- Job opportunities : Pharmacist, Basic degree for various training courses (specialization, research...), Teaching

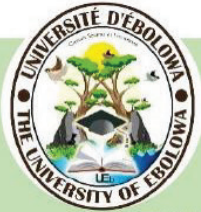
Post-Graduate school RESEARCH MASTER

- Available options : Immunology,
Microbiology,
Public health,
Drug Science and alternative medicine
- Required degree : Doctorate in Dentistry/ General medicine/ Pharmacy and / or Bachelor (options)
- Training duration : 2 years
- Obtained degree : Master 2
- Job opportunities : Research team member, Teaching



B.P 599 Sangmélima

[www . fmshp.unv-ebolowa.cm](http://www.fmshp.unv-ebolowa.cm)



Présentation

- Grande école de l'Université d'Ebolowa
- Création : Décret n°2022/009 du 06 janvier 2022
- Missions : Enseignement, recherche, appui au développement
- Formation initiale en médecine et pharmacie
- Unité de recherche et formation doctorale

Localisation

Cinq sites actuels :

- **Bitom, Hôpital de Référence de Sangmélima (HRS)** : Décanat, Services administratifs, Salles de cours
- **Bitom, derrière HRS** : Départements
- **Bissono** : Services administratifs, Bibliothèque, Salles de cours, Laboratoires
- **Nkolnguét, Université Inter-Etats** : 1 bureau, 1 salle de cours
- **Mbeli'i, ENIEG de Sangmélima** : 4 salles de cours

Nos filières

Formation initiale MEDECINE GENERALE

- Profil d'admission : Baccalauréat d'enseignement général C ou D / GCE Advanced level in Chemistry and Biology
- Durée de formation : 7 ans
- Diplôme obtenu : Doctorat en médecine générale
- Débouchés : Médecin, Diplôme de base pour formations diverses (spécialisation, recherche...), Enseignement

Formation initiale PHARMACIE

- Profil d'admission : Baccalauréat d'enseignement général C ou D / CE Advanced level in Chemistry and Biology
- Durée de formation : 7 ans
- Diplôme obtenu : Doctorat en pharmacie
- Débouchés : Pharmacien, Diplôme de base pour formations diverses (spécialisation, recherche...), Enseignement

Ecole doctorale MASTER DE RECHERCHE

- Options disponibles : Immunologie, Microbiologie, Santé publique, Science du médicament et médecine traditionnelle
- Diplômes d'admission : Doctorat en Médecine bucco-dentaire / Médecine générale / Pharmacie et / ou Licence (selon les options)
- Durée de formation : 2 ans
- Diplôme obtenu : Master 2
- Débouchés : Membres des équipes de recherche, Enseignement



B.P 599 Sangmélima

[www . fmssp.unv-ebolowa.cm](http://www.fmssp.unv-ebolowa.cm)



About Journal of Science and Diseases

JOURNAL SCOPE

Journal of Science and Disease (JSD) is a generalist and multidisciplinary journal, published by the Faculty of Medicine and Pharmaceutical Sciences of the University of Ebolowa (FMSP-UEb). Journal of Science and Diseases is a quarterly journal. It is addressed to all health actors in a multidisciplinary perspective (Internal Medicine and Specialties, Surgery and Specialties, Gynecology-Obstetrics and Human Reproduction, Pediatrics, Odontostomatology, Nursing and Health Sciences, Morphological Sciences and Medical Imaging, Pharmaceutical Sciences and Practices, Public Health and Social Sciences, Biological Sciences). Its purpose is to support research in the health sciences, to promote the sharing of knowledge between researchers and field workers, and to facilitate the exchange of practices between professionals. It is a peer-reviewed, open access, paper and digital journal that publishes original articles, general reviews, educational articles, letters to the editor and others in French or English. Articles submitted must not have been previously published or submitted simultaneously to another journal.

JOURNAL FACTS

Publisher: Faculty of Medicine and Pharmaceutical Sciences. The University of Ebolowa

Managing editor: FOUMANE Pascal

Editor in chief: BENGONO BENGONO Roddy Stéphan

Editorial secretariat:

- NDOUMBA MINTYA Annick
- ASSENE EDOU Marie Chanceline Raïssa

Designer :

- NGO'O MBANG Servais
- LOWE NANTCHOUANG Jacqueline Michèle épouse ABISSEGUE

Editorial committee :

- ATANGANA Paul Jean Adrien
- ESSOMBA MANY Antoine Achille
- NOAH NOAH Dominique
- NGO UM KINJEL épouse SAP Suzanne
- NDOUMBA MINTYA Annick épouse MINTYA
- MAKEMGUE Louise Stéphanie
- ABESOLO ABESOLO Hermine
- LOWE NANTCHOUANG Jacqueline Michèle épouse ABISSEGUE
- NGANDO Laure épouse MOUDOUTE
- NYANGONO NDONGO Martin
- EYEBE EYEBE Serges

Technical Editor :

- MATAKON NGAROUA Modeste

Scientific committee:

1. **Internal Medicine and specialties:** NTONE ENYIME Félicien, KOUOTOU Emmanuel Armand, HAMADOU BA, MENANGA Alain Patrick, ANKOUANE ANDOULO Firmin, KAZE François, PEFURA YONE Eric Walter, SINGWE Madeleine épouse NGANDEU, SOBNOWI Eugène, ASHUNTANTANG Gloria, NDOM Paul, NOAH NOAH Dominique, NJOYA OUDOU, KINGUE Samuel, NJAMNSHI KONGNYU Alfred, NGOUADJEU Evelyne, CHOUKEM Siméon Pierre
2. **Surgery and specialties:** NGATCHOU DJOMO William, MINDJA EKO David, HANDY EONE Daniel, GUIFO Marc Leroy, MOUAFU TAMBO Faustin, DJIENTCHEU Vincent de Paul, ESSOMBA Arthur, NGOWE NGOWE Marcelin, OWONO ETOUNDI Paul, BEYIHA Gérard, ESIENE Agnès, ZE MINKANDE Jacqueline, EBANA MVOGO Côme, NDJOLO Alexis, OMGBWA EBALE André, DJOMOU François, ESSOMBA MANY Antoine Achille, NZOGHE NGUEMA Pierre (Gabon), OTIOBANDA Gilbert (Congo), ZOUMENOU Eugène (Benin), BROUH YAPO (Ivory Coast), SIMA ZUE Adrien (Gabon)
3. **Pediatrics:** KOKI Paul, MONEBENIMP Francesca, CHIABI Andreas, CHELO David, NGUEFACK Séraphin, NGUEFACK Félicité épouse DONGMO, MAH Evelyn, NGO UM Suzanne épouse SAP, KALLA Ginette épouse MBOPI-KEOU
4. **Obstetrics - Gynecology and Human reproduction:** FOMULU Nelson, MBU ENOW Robinson, KASIA Jean Marie, MBOUDOU Emile Télesphore, TEBEU Pierre Marie, FOUMANE Pascal, MVE KOH Valère, DOHBIT SAMA Julius, NKWABONG Elie, HALLE-EKANE Gregory, ITOUA Clotaire (Congo), FOUMSOU LHAGADANG (Chad), BANG NTAMACK Jacques Albert (Gabon), ADJOBI Roland (Ivory Coast), DOUMBIA Yacouba (Ivory Coast), TONATO BAGNAN Angeline Josiane (Benin), SOULEYMANE ALBERT (Burkina-Faso), ADJOBY CASSOU Roland (Ivory Coast)
5. **Morphological Sciences and Medical Imaging:** MOIFO Boniface, ZEH Odile Fernande, ONGOLO ZOGO Pierre, NKO'O AMVENE Samuel, SANDO Zacharie, ESSAME OYONO Jean Louis, MENDIMI NKODO Joseph, ATANGANA Paul Jean Adrien, KABEYENE Angèle, ENOW OROCK Georges
6. **Biological Sciences:** AMA MOOR Vicky, MBOPI-KEOU François Xavier, NDONGO Judith épouse TORIMIRO, PIEME Anatole, ADIOGO Dieudonné, KAMGA Hortense épouse GONSU, Mbanya Dora, OKOMO ASSOUMOU Marie Claire, TOUKAM Michel, ETOUNDI NGOA Laurent, ASSOMO NDEMBA Peguy, MEZUI Christophe, TCHUEM TCHUENTE Louis Albert, KEKENOU Sevilor, ZEBAZE TOGOUET, POKAM Benjamin, ASSOBY Jules Clément, DZEUFUET Zephirin, EDIMA Hélène Carole, YAP BOUM II, AYISSI MBOMO Rigobert
7. **Odontostomatology:** BENGONDO MESSANGA Charles, ESSAMA ENO BELINGA Lawrence épouse BELL, AGBOR Michael Ashu

8. **Pharmaceutical Sciences and Practices:** FOKUNANG Charles, MPONDOMPONDO Emmanuel, NTSAMA ESSOMBA Claudine, NGOUPAYO Joseph, GUEDJE Marie, NGONO MBALLA Rose épouse ABONDO, NNANGA NGA Emmanuel, NDOM Jean Claude
9. **Public Health and Social Sciences:** KAMGNO Joseph, NGUEFACK TSAGUE Georges, ESSI Marie Josée, TAKOUGANG Innocent, BEDIANG Georges Wylfred, EBALE Raymond

Review committee:

1. **Internal Medicine and specialties:** NTSAMA ESSOMBA Marie Josiane épouse EBODE, MAIMOUNA MAHAMAT, NDAM NJITOYAP Antonin, BALEPNA Jean Yves, GOBINA Ronald, BASSEGUIN ATCHOU Jonas, ABESSOLO ABESSOLO Hermine, NDONGO AMOUGOU Sylvie épouse ZAME, EPOTE Annie, FOPA Diderot, NGUEKENG Elvige, NDOM EBONGUE Marie Solange, MFEUKEU KUATE Liliane, ATENGUENA OKOBALEMBBA Etienne, FOUA Hermine épouse EBANA, BOOMBHI Jérôme, NGANOU Chris Nadège épouse GNINDJIO
2. **Surgery and specialties:** BIWOLE BIWOLE Daniel Claude, SAVOM Eric, MBOUCHE Landry, MEKEME MEKEME Junior, ASTADJAM DAIROU Iyale, EKANI BOUKAR Yannick Mahamat, DJOUBAIROU Ben Ousman, MBELE Richard II, AMENGLE Ludovic, NGO YAMBEN Marie Ange, NGO NYEKI Adèle Rose, épouse MOUAHABELL, ANDJOCK NKOOU Yves, MEVA'A BIOUELE Roger Christian, MOSSUS Yannick, BOLA Antoine, AKONO ZOUA Marie, NOMO Arlette Francine, MVILONGO Caroline épouse BENGONO, BWELE Georges, NDOM NTOCK Ferdinand, KONA NGONDO François Stéphane, IROUME Cristella épouse NTYO'O NKOUMOU, NGOUATNA DJEMAKOU Serge Rawlings, NDIKONTAR KWINJI Raymond, BANG Guy, METOGO MBENGONO Junette épouse NJOKI, JEMEA Bonaventure, BENGONO BENGONO Roddy Stéphan, KOKI Godefroy, DOHVOMA Andin Viola, BILONG Yannick, EBANA MVOGO Steve Robert, ELOMBILA Marie (Congo), NGOMAS Jean Félix (Gabon), MAWANDZA Peggy Dahlia Gallou épouse LEYONO (Congo), Hamza Sama (Togo)
3. **Pediatrics:** MEKONE NKWELE Isabelle, MEGUIEZE Claude-Audrey, TONY NENGOM Jocelyn, DJIKE Yolande épouse FOKAM
4. **Obstetrics – Gynecology and Human reproduction:** TOMPEEN Isidore, NYADA Serge Robert, METOGO NTSAMA Junie, ESSIBEN Felix, BELINGA Etienne, NOA NDOUA Claude, NGO UM Esther épouse MEKA,
5. **Morphological Sciences and Medical Imaging:** SEME ENGOUMOU Ambroise, HAOUA TEBERE, MOULIOM TAPOUH Jean Roger, TAMBE Joshua, MBALLA AMOUGOU Jean Claude, MBEDE Maggy épouse ENDEGUE MANGA, NKEGOUUM Blaise, NGO PAMBE Christiane
6. **Biological Sciences:** VOUNDI VOUNDI Esther, NDOUMBA NKENGUE Annick épouse MINTYA, AZABJI KENFACK Marcel, IKOMEY Georges, CHETCHA CHEMEGNI Bernard, NGO SACK Françoise, ESSOMBA René Ghislain, MAKEMGUE Louise Stéphanie, FOKAM Joseph, MABIAMA Gustave
7. **Odontostomatology:** EDOUMA BOHIMBO Jacques Gérard, NDJOH Jules Julien, MBEDE NGA MVONDO Rose, LOWE NANTCHOUANG Jacqueline épouse ABISSEGUE, MENGONG Hortense épouse MONEBOULOU, NOKAM Marie Elvire épouse ABENA
8. **Pharmaceutical Sciences and Practices:** ZINGUE

Stéphane, NYANGONO NDONGO Martin, SOPPO LOBE Charlotte Vanessa, MBOLE Jeanne Mauricette épouse MVONDO, NGO NYOBE Caroline Judith

9. **Public Health and Social Sciences:** EYEBE EYEBE Serges, ABBA-KABIR HAAMIT, ETOUNOU Tatiana épouse MOSSUS, AMANI ADIDJA
10. **Nursing and Health Sciences:** NGANDO Laure épouse MOUDOUTE, KOUAM FOUBI Brice, LELE BOMGNI Samuel

INDEXING

Journal of Sciences and Disease home page:

Contact information

Journal of Science and Diseases
Faculty of Medicine and Pharmaceutical Sciences
PO Box 599, Sangmelima, Cameroon.

MANUSCRIPT SUBMISSIONS

Whilst anticipating an online submission system and the creation of a submission template, submission can be done by email to the following address: rodbeng@yahoo.fr or editor@jsd-fmisp-ueb.cm.

EDITORIAL POLICIES

JSD's Publications Policy Committee follows the recommendations of the International Committee of Medical Journal Editors (ICMJE), the World Association of Medical Editors (WAME), and the Committee on Publication Ethics (COPE) for guidance on policies and procedures related to publication ethics. The policies for JSD have been adapted from those three advisory bodies and, where necessary, modified and tailored to meet the specific content, audiences, and aims of JSD.

A. Plagiarism, scientific Misconduct

Manuscripts proven of plagiarism will be returned to the authors without peer review. The editors reserve the right to request that the authors provide additional data collected during their investigations. The editors also reserve the right to send a copy of the manuscript and data in question to the author's dean, university, or supervisor or, in the case of an investigation being funded by an agency, to that funding agency for appreciation.

B. Conflict of Interest

At the time of submission, authors are asked to disclose whether they have any relationship(s) that may influence directly or indirectly the work submitted for consideration.

C. Human and Animal Studies

Manuscripts reporting results of prospective or retrospective studies involving human subjects must document that appropriate institutional review board (IRB) approval and informed consent were obtained (or waived by the IRB) after the nature of the procedure(s) had been fully explained.

D. Authorship

To be listed as an author, an individual must have made substantial contributions to all three categories established by the ICMJE (<http://www.icmje.org>): (a) "conception and design, or acquisition of data, or analysis and interpretation of data," (b) "drafting the article or revising it critically for important intellectual content," and (c) "final approval of the version to be published." Individuals who have not made substantial contributions in all three categories but who have made substantial contributions either to some of them or in other areas should be listed in acknowledgments.

E. Language

JSD is bilingual and accepts publications in French and English. All the publications should have title and abstract in both languages. Whenever possible picture captions and table titles should be in both languages.

TYPES OF ARTICLES

A. Original articles

Original Articles are expected to present a significant advance in health sciences. Maximum length for a standard research article is 4,000 words of text - not counting the abstract, tables, figure legends, and references. Abstracts must not exceed 250 words and should be structured with no references. Submissions are limited to a total of 7 figures and tables, and a maximum of 4 tables. Digital images are required. References should be limited to 35. The sections of a standard research article should be ordered Abstract, Introduction, Materials and Methods, Results, Discussion, Acknowledgements, Authorship Contributions and Disclosure of Conflicts of Interest, References, Tables, Figure Legends, Figures and Appendix. Supplemental data - to be published online only - may include additional information regarding methodology, supplemental figures or tables, or primary data sets; it must be submitted with the original manuscript submission so it can be peer reviewed. Manuscripts should adhere to the Uniform requirements submitted to biomedical journals developed by the ICMJE and contain the following sections:

Abstract

A clearly written abstract is crucial for the purpose of peer and editorial review of the manuscript as well as maximizing visibility from electronic databases once the manuscript is published. The abstract should contain the following sections: Background or Purpose (the rationale for the study), Methods (how the study was done), Results (the principal findings), Interpretation (a discussion of the results).

Summary Statement

The author is encouraged to include a summary statement. The summary statement is a single sentence, taken directly from the text, that best summarizes the manuscript and explains the advances in knowledge of the study. It should be displayed in the abbreviated title page. Summary statements may not exceed 255 characters.

Introduction

This section should inform the reader of the topic being studied and provide the context for the research question. Do not review the literature extensively. Give only strictly pertinent background information and references that inform the reader as to why the study was performed. The final paragraph should clearly state the hypothesis and purpose of the study in a fashion similar to the Purpose statement in the abstract. Brevity and focus are important. Generally, the introduction should not exceed 400 words.

Materials and methods

Describe clearly the number and selection of the subjects studied and any instruments or drugs (including contrast agents) used. Procedures should be described in sufficient detail to allow others to reproduce the study. It is essential that the manner in which studies were evaluated is explained (e.g., blinded vs unblinded and independent vs consensus readings). State the number of years of experience of those who performed readings or evaluations. State clearly if this is a retrospective or prospective study. Give references to established methods, including statistical methods that have been published but are not well known; describe new or substantially modified

methods and give reasons for using these techniques. For studies using human subjects, one paragraph should address ethical concerns. The last paragraph should state the statistical methods used. Authors are encouraged to seek statistical consultation before planning a study to ensure appropriate enrollment and collection of data and the use of statistical tools. Make sure that the Materials and Methods section includes all items presented in the Results section. Generally, Materials and Methods should not exceed 800 words.

Results

Present the results in logical sequence in the text, along with tables and illustrations. Wherever possible, results should be summarized in tabular format. Authors should avoid any redundant presentation of data in tables and in the text of the manuscript. Make sure to give results for all items evaluated as mentioned in Materials and Methods. State the statistical significance of the findings. Numerators and denominators must be provided either in the text or the tables for all percentages given. Generally, Results should not exceed 1000 words, especially if tables have been included.

Discussion

This section should include 4 parts: a) brief summary of the main results of the study (1 paragraph); b) explanation for the findings; comparison and contrast of findings with other related studies emphasizing the advances in knowledge in your study (1 or 2 paragraphs); c) limitations of the study (1 paragraph); d) conclusions, practical applications and future directions in the field of study (1 paragraph). Generally, the discussion should not exceed 800 words.

Acknowledgment(s)

You may acknowledge those who have contributed substantially to the work reported in the manuscript but who have not fulfilled the ICMJE requirements for authorship. Those acknowledged must submit written permission to be cited.

Authorship Contributions and Disclosure of Conflicts of Interest

Any involvement of medical writers/researchers, particularly those employed or supported by the pharmaceutical industry, in the writing of an article must be clearly defined and disclosed in the Authorship and/or the Acknowledgements section(s) as appropriate. This type of involvement must also be disclosed to the Editor-in-Chief in the Cover Letter.

References

Number references consecutively in the order in which they are first mentioned in the manuscript. The abbreviations used for periodicals cited in the references should follow the style of the National Library of Medicine.

Abstracts, editorials, and letters to the editor should be noted as such. Articles that appear in online journals should follow the same citation format as print articles, with the addition of the URL and the date the article was accessed. In the case of books, the authors of a chapter, title of the chapter, editor(s), title of the book, edition, city and state, publisher, year, and specific pages must be provided.

For Web content, the following items should be listed: author(s) (if any); title of the page or content; name or owner of the Web site; URL; and publication, update, and access dates. It is the responsibility of the author(s) to verify the accuracy of all references to ensure linking of referenced articles in the online journal.

The authors are strongly encouraged to use Zotero free software as their references manager.

Tables

Tables should be and should have a title. All abbreviations used in the table should be explained in a footnote. Tables should be presented in the style used in recent issues of the journal. Tables should be prepared in Word or Excel and embedded in the text document, each on a separate page. The number of tables should not exceed four.

Figure legends

Figures should appear sequentially in the text. A caption must be supplied for each illustration, including drawings and graphs, and should not duplicate text material. It is essential that the caption describe all labels placed on an illustration. The caption should include the type of image and the features to be observed by the reader. For photomicrographs, include the stain and original magnification.

Images and illustrations

Digital images must be 300 dpi (dots per inch; 1200 dpi for line art) and no larger than 15 × 15 cm or smaller than 5 × 5 cm.

Appendix

When essential for the understanding of the study, detailed background information, mathematical derivations, statistical analyses, and the like should be presented in one or more appendices. Include in the appropriate section of the text (e.g., Materials and Methods, Results) a brief summary of the information contained in the Appendix, and make reference to the Appendix.

Supplemental Material

Online-only publication of supplemental material is designed to take full advantage of the Internet medium and allows publication of material that cannot be accommodated in print. This material can include (a) multimedia (e.g., animation, dynamic image sets [movies], audio), (b) large numbers of relevant images whose number would exceed the limits of print publication, (c) relevant data in the form of tables or text that could not be accommodated in the print version, and (d) interactive materials such as Java applets and other programs for expanding browser capabilities and interactivity in areas such as image display and computer-assisted instruction.

Check lists

1. For studies dealing with diagnostic accuracy, use the Standards for Reporting of Diagnostic Accuracy (STARD) <http://www.equator-network.org/reportingguidelines/stard/>
2. For randomized controlled trials, use the CONSORT (Consolidated Standards of Reporting Trials) statement (BMJ 2010; 340).
3. For systemic reviews and meta-analyses of diagnostic test accuracy studies, follow the PRISMA-DTA (Preferred Reporting Items for Systematic Reviews-Diagnostic Test Accuracy guidelines) <http://www.prisma-statement.org/Extensions/DTA>.
4. For observational studies, such as cohort, case-control, or cross-sectional studies, use the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. <https://www.strobement.org/index.php?id=strobe-home>

Use of checklists allows authors to describe their work more effectively, aiding the detailed scientific review of their work and its implications for patient care or future biomedical research. This critical evaluation also aids authors in the discussion of the limitations and biases inherent in their study.

B. Clinical Cases

This section presents clinical cases with practical lessons for the developing countries. Preference is given to common presentations of important rare conditions, and important unusual presentations of common problems. Clinical cases should be formatted in the following manner:

An **abstract** (100 words) outlining the case and its relevance to a general audience.

The **word limit** for the main text is 2,000 words. (The total word count **excludes** the title page, abstract, acknowledgments, references, tables and figures, and table/figure legends.)

The report should contain no more than **25 references** and the reference section should be single spaced with justified margins.

The article should contain no more than a combination of **four tables and/or figures**.

Supporting documents/data can be uploaded for review purposes and will not be published. (When uploading, be sure each file is clearly labeled "supporting document/data.") When patients are potentially identifiable, written consent for publication of the report and for the use of patient photographs, radiographs, etc., must be obtained from patients or their surrogates.

C. Brief reports

This section can be used for any original paper pertinent to the journal. The aim is to publish important data or opinions that can be concisely presented. The section can take any of the following:

Articles written by experts and providing up to date information or personal point of view regarding diagnosis and treatment of important clinical situations. Here, clear distinctions should be made between evidence-based versus experience-based recommendations.

Articles that present key statements on topics of interest to caregivers. The article should address important, missed, controversial or new information and can take the form of a sentence supported by a few sentences with references. Tables and images are permitted.

Clinical images that are original, relevant to the African context and particularly informative. The high resolution images should be labeled and accompanied with a caption, and when necessary, the patient's written consent for publication.

The author should also provide a short commentary emphasizing the lessons to be learned and some references. This section may not exceed 1,200 words of text not counting the abstract, figure legends, and references; abstracts must not exceed 150 words and should be a single paragraph with no subheadings.

Only 2 figures/tables and 15 references may be included.

D. Review Articles

These papers are an overview of a major topic or an update of knowledge, that can be disease-orientated, or address problems related to health systems or health policy. Review articles are usually solicited by the Editor-in-Chief.

Authors wishing to submit an unsolicited Review Article are invited to contact the Editor-in-Chief prior to submission, in order to screen the proposed topic for relevance and priority given other review articles that may already be in preparation.

Review articles should focus on recent scientific or clinical advances in an area of broad interest to African population. They should be comprehensive and critical, going beyond a simple summary of the data. All Review Articles are rigorously peer reviewed before a final publication decision is made.

Review articles should not exceed 4,000 words in length, must include an abstract of 250 words or fewer, and may not have more than 100 references. The use of tables and color figures to summarize critical points is encouraged.

E. Letters to the Editor

JSD considers for publications the letters to the editor that relate to articles published in JSD. The letter should also contain significant new primary data and require the inclusion of a figure or tables. A letter may not exceed 1,200 words. Only 2 figures/tables and 5 references may be included.

F. Medicine and society

This section gives readers room for expression through anecdotes, poetry, and more generally contributions that put together African culture and health in the widest context possible. Potential topics can cover a range of social aspects of medicine and health care, including environmental concerns, medical sociology, anthropology, history, and ethics, among other areas. Original, opinion-based essays are welcomed. The text is limited to 2000 words.

G. Book Reviews

Reviews of selected books in health sciences, including books that describe state-of-the-art diagnostic and therapeutic methods or important advances, and textbooks with a significant educational content relevant to Africa, will be reviewed in this section.

H. Obituaries

JSD publishes obituaries for doctors within the first year of their death. The material should be brief, but exhaustive, including one picture, biographical details: the last position held, date of birth, place and year of qualification, postgraduate qualifications if applicable, and date and cause of death.

FORMATTING THE PUBLICATION

A. Overview

Authors are advised to review several recently published articles in JSD to familiarize themselves with JSD format and requirements. Complete instructions for preparing a manuscript for electronic submission to can be found online at <http://jsd-fmsp-ueb.com>

B. Formatting Text

Manuscripts should be submitted as Microsoft Word format (.doc, version 2003 or docx version 2007 only). Manuscripts must be single spaced, left justified only, and in a basic font (e.g., Courier New, Arial, Helvetica, Times New Roman, and Calibri) no smaller than 12 points. To ensure anonymity in the peer review process, authors' names should appear on only the full title page; names of authors, their initials, and their institution(s) should not be given in the text or on the illustrations. The anonymity of patients and subjects must be preserved.

C. Units and Abbreviations

Radiation measurements and laboratory values should be given in the International System of Units (SI). Abbreviations should be spelled out when first used in the text—for example, cerebrospinal fluid (CSF)—and the use of abbreviations should be kept to a minimum. In general, only standard abbreviations will be used.

D. Order of Submission

Submit the full title page separately from the text of the document. The text of the manuscript should be submitted as a single document in the following order: abbreviated title page, abstract, text, acknowledgements (if any), references, tables (embedded, one per page), figure legends. Images must be uploaded individually. An appendix (if a text document) should be uploaded as part of the main body of the manuscript. However, if the appendix is a multimedia file, it must be uploaded separately.

Full title page.—This page should be uploaded separately and include the title of the manuscript; the first and last names, middle initials, academic degrees, and institutions (including department) of all authors; the name and address of the institution from which the work originated; the telephone number, the fax or telex number, and the e-mail address of the corresponding author; and any funding information. The address for correspondence should include the complete name, street address, and e-mail. Indicate the type of manuscript being submitted (e.g., original research, clinical cases, review, brief report, Editorial, Letter to the Editor, etc.). Provide the word count for the text

Abbreviated title page.—include only the following items, in this order: (a) manuscript title, (b) manuscript type.

Abstract.—Original research manuscripts must include a structured abstract of 250 words or fewer. The abstract must be divided into four sections: (a) Background or Purpose, a brief statement of the study's purpose; (b) Materials and Methods, numbers of patients or subjects, imaging studies and tests performed, analysis methods; (c) Results, major findings; and (d) Conclusion, a one- or two-sentence statement of conclusions derived from the results.

For State of the Art, Review, or other similar submissions, an unstructured one-paragraph abstract of 100–250 words should summarize the content of the submission, but specific headings should not be included.

E. Text

The text of original research manuscripts should be arranged in sections under the following headings: Introduction, Materials and Methods, Results, and Discussion. There is a 4000-word limit for these sections of the text. Subheadings in the Materials and Methods and Results sections are encouraged. Avoid idiosyncratic word usage, nonstandard terms or abbreviations, and self-evaluation of your work (e.g., “novel,” “unique”). Please spell out in full any acronym or abbreviation when first used both in the Abstract and in the text.

F. Confirmation of submission

Manuscript receipt will be acknowledged when the submission is complete. If you do not receive an acknowledgement, please contact us.

CORRECTIONS

Once a manuscript is accepted for publication, we accept corrections for grammatical and orthographic errors as well as corrections in the spelling of author names or affiliation; but, we do not accept to change the order of authors, add new authors or remove authors. Moreover, significant changes anywhere in the text are not accepted after publication.

COPYRIGHT NOTICE

Authors who publish with this journal agree to the following terms:

- Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a Creative Commons Attribution License that allows others to share the work with an acknowledgement of the work's authorship and initial publication in this journal.
- Authors are able to enter into separate, additional contractual arrangements for the non-exclusive distribution of the journal's published version of the work (e.g., post it to an institutional repository or publish it in a book), with an acknowledgement of its initial publication in this journal.
- Authors are permitted and encouraged to post their work online (e.g., in institutional repositories or on their website) prior to and during the submission process, as it can lead to productive exchanges, as well as earlier and greater citation of published work





Contents

* In this Issue	1
* About Journal of Science and Diseases	4
* Avant – Propos	11
* Editorial	12

RESEARCH ARTICLES

(1) Cancer du sein pris en charge dans l'unité d'oncologie gynécologique du Centre Hospitalier Universitaire Sylvanus Olympio de 2019 à 2023 <i>Ketevi et al</i>	14
(2) Factors associated with infertility in women less than 25 years <i>Nsahlai et al</i>	18
(3) Clinical, biological, morphological and histological profile of prostate cancer at the Central Hospital in Yaoundé <i>Fouda et al</i>	25
(4) Aspects cliniques, thérapeutiques et évolutifs de l'infertilité du couple : étude quantitative dans une zone semi-urbaine du Cameroun <i>Alima et al</i>	32
(5) La torsion du cordon spermatique à l'Hôpital Central de Yaoundé <i>Fouda et al</i>	38
(6) Facteurs de risque cardiovasculaire en milieu hospitalier du Nord-Cameroun : Etude transversale à l'Hôpital Général de Garoua <i>Hadja Inna et al</i>	44
(7) Determinant related to amputation and mortality among patients with diabetic foot at Yaoundé central Hospital <i>Ekani Boukar et al</i>	49
(8) Radical retropubic prostatectomy by laparoscopic approach versus open surgery for localized prostate cancer. Techniques and results in two Cameroonian university teaching hospitals <i>Mekeme et al</i>	53
(9) Surgical Management of Sciatica due to Lumbar Disc Herniation: Epidemiology, Quality of Life and Postoperative Outcome at Yaoundé Military Hospital: A Retrospective Study <i>Djoubairou et al</i>	58
(10) Aspects épidémiologiques, diagnostiques et thérapeutiques des cellulites cervico-faciales dans le service de Stomatologie et Chirurgie maxillo-faciale du centre hospitalier universitaire Yalgado Ouédraogo <i>Bazame et al</i>	64
(11) High prevalence of multidrug-resistant bacteria in diabetic foot infections: a 59 series from a district hospital in Cameroon <i>Ngono et al</i>	70
(12) Factors associated with academic performance in children living with epilepsy followed in a pediatric referral hospital in Cameroon <i>Enyama et al</i>	74
(13) Itinerary and determinants of loss to follow-up of pregnant women at the Yaoundé Gynaeco-Obstetrics and Paediatric Hospital <i>Nyada et al</i>	80
(14) Indications and Findings of Pediatric Chest X-Rays in a Secondary Referral Hospital in Cameroon <i>Dongmo Fomekong et al</i>	87
(15) Maternal Mortality Audits at the Yaoundé Teaching Hospital Center in Cameroon between 2017 and 2023: Findings and Quality Improvement Perspectives <i>Mboua Batoum et al</i>	92
(16) Barrières à l'implémentation de la Méthode Mère Kangourou dans trois formations sanitaires de la région du centre Cameroun <i>Ehouzou et al</i>	97
(17) Informed consent: myth or reality in the surgical units of Yaoundé Central Hospital? <i>Meva'a Biouele et al</i>	104

CLINICAL CASES

(18) A rare postpartum presentation of appendiceal rupture concealed by uterine myoma : a case report <i>Nsahlai et al</i>	110
(19) Avoidable death from complicated epigastric hernia in a resource limited setting <i>Ewole Ella et al</i>	114
(20) Difficultés dans le diagnostic étiologique de la glomérulonéphrite aiguë post streptococcique chez l'enfant : à propos de 2 cas au service de pédiatrie du CHU Libreville <i>Minto'o et al</i>	118



Avant - Propos

L'Université d'Ebolowa a l'ambition d'être à la pointe de l'entrepreneuriat, de l'innovation scientifique et technologique, utiles au développement de notre pays. Cette noble ambition devrait s'appuyer sur des travaux de recherche de haute qualité réalisés dans les laboratoires de notre institution universitaire.

Le journal scientifique de la Faculté de Médecine et des Sciences Pharmaceutiques de l'Université d'Ebolowa à Sangmélima, offre une tribune permettant la dissémination des résultats de nos recherches auprès des scientifiques du monde entier, et assure une implémentation visible de notre vision stratégique en matière de recherche.

J'invite les enseignants, les chercheurs et les spécialistes des sciences de la santé à soumettre leurs travaux et à faire de cette revue une référence dans son domaine.



Pr. Etoa Jean Bosco

Recteur de l'Université d'Ebolowa

Editorial



Chères lectrices, chers lecteurs, L'équipe de rédaction et de publication du **Journal of Science and Diseases (JSD)** est heureuse de mettre à votre disposition sa quatrième parution de l'année 2025.

Ce numéro, disponible sur le site web www.jsd-fmsp-ueb.com, apporte des données intéressantes aux scientifiques dans le domaine des sciences de la santé :

- Au Centre Hospitalier Universitaire Sylvanus Olympio de Lomé (Togo), plus du tiers des cancers observés chez la femme concernent le sein. Un antécédent familial est retrouvé chez près de 30% des sujets malades. Une femme atteinte sur trois est âgée de moins de 45 ans. L'immense majorité des femmes consultent à stade avancé de la maladie.
- D'après une équipe de chercheurs de l'Université de Yaoundé 1, les infections génitales, les adhérences tubaires et le syndrome des ovaires polykystiques sont les principales étiologies de l'infertilité chez les femmes de moins de 25 ans. Les facteurs statistiquement associés à cette situation incluent la vie en couple, le chômage, la ménarche précoce, les infections sexuellement transmises, l'obésité et l'alcool.
- L'écrasante majorité (92%) des cancers de la prostate suivis à l'Hôpital Central de Yaoundé présentent des métastases. La mise en œuvre urgente d'une politique nationale de dépistage et d'un registre national est recommandée.
- A l'Hôpital Régional de Bafoussam, l'infertilité concerne une femme sur cinq venant en consultation de gynécologie. Près de 20% des couples parviennent à une grossesse après prise en charge dans cette formation hospitalière.
- A l'Hôpital Central de Yaoundé, la torsion du cordon spermatique se manifeste principalement par la douleur aiguë au niveau d'un testicule. L'équipe chirurgicale se trouve dans l'obligation de procéder à l'ablation du testicule concerné dans la majorité des cas.
- Les facteurs de risque cardiovasculaires modifiables chez les patients hospitalisés à l'Hôpital Général de Garoua sont : l'hypertension artérielle, la sédentarité, le diabète sucré, la valeur de LDL-cholestérol au-delà des objectifs, le débit de filtration glomérulaire <60ml/mn, l'hyperuricémie asymptomatique ou la goutte, la valeur du HDL-cholestérol en-dessous des objectifs, l'obésité, la consommation de tabac et d'alcool. Des mesures de prévention adaptées sont proposées à chaque sujet.
- En analysant 329 cas de pied diabétique, une équipe conjointe des Universités de Buéa, Garoua et Yaoundé 1, rapporte 23% d'amputation et 23% de décès. La dyslipidémie et une classification de Wagner ≥ 4 seraient des facteurs prédictifs indépendants de décès dans cette pathologie.
- Pour les équipes d'urologie de l'Hôpital Laquintinie de Douala et de l'Hôpital Central de Yaoundé, la prostatectomie radicale rétro-pubienne à ciel ouvert, en comparaison avec la prostatectomie radicale rétro-pubienne par voie laparoscopique, présenterait plus de complications peropératoires dans la prise en charge du cancer de la prostate. Cependant, à moyen terme, il n'y aurait aucune différence significative entre les deux voies d'abord.
- D'après une équipe de l'Université de Douala, la prise en charge chirurgicale de la douleur sciatique liée à la hernie discale lombaire à l'Hôpital Militaire de Yaoundé connaît une évolution favorable dans la majorité des cas, avec 92% de reprise des activités professionnelles au bout de trois mois, en cohérence avec les données de la littérature mondiale.
- D'après des chercheurs du Centre Hospitalier Universitaire Yalgado Ouedraogo de Ouagadougou (Burkina-Faso), les cellulites cervico-faciales sont fréquentes (7%) et proviendraient majoritairement de la dent et de ses tissus de soutien. Six décès (5% des sujets) sont rapportés.
- Des chercheurs des universités d'Ebolowa et de Douala observent, à l'Hôpital de District de la Cité Verte à Yaoundé (centre de référence de prise en charge du diabète), que le pied diabétique est majoritairement infecté par des bacilles Gram négatifs (*Klebsiella pneumoniae*, *Proteus mirabilis*, *Escherichia coli*) et des cocci Gram positifs (*Staphylococcus saprophyticus*), avec un taux de résistance élevé aux bêta-lactamines et à la vancomycine.
- En étudiant les performances scolaires de 106 enfants vivant avec l'épilepsie, une équipe conjointe de chercheurs des universités de Dschang, Douala et Yaoundé 1 rapportent que l'épilepsie idiopathique, un âge supérieur à 5 ans au moment du diagnostic, le soutien scolaire après l'école et une faible fréquence des crises sont associés à de bons résultats scolaires.
- Près de la moitié des femmes enceintes suivies à l'Hôpital Gynéco-Obstétrique et Pédiatrique de Yaoundé sont perdues de vue et accouchent préférentiellement dans des formations sanitaires privées. Les raisons évoquées incluent la distance éloignée, la barrière financière, le déménagement et les frustrations en rapport avec le comportement du personnel.
- Les radiographies thoraciques de l'enfant réalisées à l'Hôpital Régional de Buea retrouvent majoritairement des bronchiolites et des pneumonies.
- En parcourant les rapports d'audit des décès maternels au Centre Hospitalier et Universitaire de Yaoundé, des chercheurs de l'Université de Yaoundé 1 trouvent que ces décès surviennent après l'accouchement (75 %) et sont évitables (75%). Près de 90% de ces décès sont liés au retard de mise en œuvre des soins hospitaliers.
- Une équipe de chercheurs issus des universités de Dschang, Ebolowa et Garoua rapporte les résultats d'une étude qualitative sur l'implémentation de la méthode mère kangourou dans trois formations sanitaires de la Région du Centre. Les résultats identifient comme barrières principales : implication administrative faible, difficultés de recrutement du personnel qualifié, non-respect des normes infrastructurelles de la méthode mère kangourou, communication difficile avec les mères due aux barrières linguistiques et culturelles, obstacles liés aux mères (absentéisme, instabilité médicale),

réticence familiale notamment des seconds porteurs, faible implication du personnel post-projet, difficultés d'accès au suivi ambulatoire et absence d'incitations financières après le projet.

- Des chercheurs de l'Université de Yaoundé 1 rapportent que l'obtention du consentement éclairé était une réalité chez la quasi-totalité (98%) des sujets devant être opérés à l'Hôpital Central de Yaoundé en 2024.
- Un cas clinique inhabituel est rapporté. Il s'agit d'une rupture appendiculaire sur un myome nécrotique, se présentant comme un abdomen aigu, survenant 12 heures après un accouchement normal par voie basse, chez une primipare de 31 ans.
- Le cas d'un décès par sepsis survenant sur une hernie ombilicale étranglée, compliquée par une fasciite nécrosante et une nécrose intestinale, est rapporté à l'Hôpital de Référence de Sangmelima, chez une jeune femme de 20 ans, ayant consulté après cinq jours de médicaments indigènes.
- Une équipe du Centre Hospitalier Universitaire de Libreville (Gabon) met en lumière les difficultés rencontrées pour faire le diagnostic étiologique de la glomérulonéphrite aiguë post-streptococcique chez l'enfant, à travers deux cas rapportés dans cette formation sanitaire

En vous remerciant pour vos apports multiples en vue du succès de cette aventure scientifique, l'équipe de publication du **Journal of Science and Diseases** vous souhaite une heureuse année 2026, ainsi qu'une utilisation rigoureuse et utile des données, et vous encourage à soumettre vos manuscrits sur le site www.jsd-fmsp-ueb.com.

Pr. Foumane Pascal
Directeur de Publication



Cancer du sein pris en charge dans l'unité d'oncologie gynécologique du Centre Hospitalier Universitaire Sylvanus Olympio de 2019 à 2023

Breast cancer treated in the gynaecological oncology unit at Sylvanus Olympio University Teaching Hospital from 2019 to 2023

Keteve AA^{1*}, Musengelwa Basubi F¹, Kossi Logbo-Akey E², Komlan Andele A¹, Baguilane Douaguibe¹, Akila Bassowa¹, Dédé Rd Ajavon², Abdoul Aboubakari S², Akpadza K¹

Article Original

1. Faculté des Sciences de la Santé ; Université de Lomé, Togo

2. Faculté des Sciences de la Santé ; Université de Kara, Togo.

Auteur Correspondant : Keteve Améyo Ayoko, Faculté des Sciences de la Santé ; Université de Lomé, Centre Hospitalier Universitaire Sylvanus Olympio 08 BP 8004 Lomé-Togo ; Téléphone : (00228) 91 88 80 88. E-mail : tketeve@yahoo.fr

Mots clés : cancer, sein, traitement, Togo.

Keywords: cancer, breast, treatment, Togo.

Date de soumission: 19/08/2025

Date d'acceptation: 27/11/2025

RESUME

Introduction : Au Togo, on reste confronté à la découverte tardive des cancers du sein (75%). Le but de l'étude était d'étudier la prise en charge du cancer du sein dans l'Unité d'Oncologie Gynécologique du CHU Sylvanus Olympio (SO) de 2019 à 2023.

Matériel et méthodes: Il s'est agi d'une étude transversale à visée descriptive, allant du 1er Janvier 2019 au 31 Décembre 2023, chez 282 patientes, prises en charge pour cancer du sein dans l'Unité d'Oncologie Gynécologique du CHU SO. Les variables étudiées ont été comparées grâce aux tests Chi carré ou Fisher avec comme seuil de significativité une valeur de $p < 0,05$.

Résultats : La fréquence hospitalière était de 36,2%. L'âge moyen des patientes était de $54,4 \pm 12,9$ ans avec des extrêmes de 30 et 87 ans. Les patientes n'avaient jamais allaité dans 30,9 % des cas et 28,7 % avaient un antécédent familial de cancer du sein. Le délai moyen de consultation des patientes était de 6,1 mois $\pm$ 2,1 mois et l'aspect échomammographique BIRADS 5 était retrouvé dans 53,2 % des cas. Elle ont toutes bénéficié d'un traitement symptomatique et d'une psychothérapie, tandis que 42,5% ont bénéficié d'une chimiothérapie et 12,4% d'une mastectomie. Il existait un lien significatif entre le traitement reçu et l'évolution clinique.

Conclusion : Les patientes ont consulté au stade avancé de la maladie. La chimiothérapie, la mastectomie, l'hormonothérapie et la radiothérapie étaient réalisées. Il existait un lien statistiquement significatif entre le traitement reçu et l'évolution clinique.

ABSTRACT

Introduction: In Togo, breast cancer is still often diagnosed at a late stage (75%). The overall objective is to study the management of breast cancer in the Gynecological Oncology Unit of the CHU SO from 2019 to 2023.

Materials and methods: This was a descriptive cross-sectional study conducted between January 1, 2019, and December 31, 2023, involving 282 patients treated for breast cancer in the Gynecological Oncology Unit of the CHU SO. The variables studied were compared using Chi-square or Fisher's exact tests with a significance threshold of $p < 0.05$.

Results: The hospital prevalence was 36.2%. The average age of the patients was 54.4 ± 12.9 years, with extremes of 30 and 87 years. In 30.9% of cases, the patients had never breastfed, and 28.7% had a family history of breast cancer. The average time between diagnosis and consultation was 6.1 months $\pm$ 2.1 months, and BIRADS 5 echomammography findings were found in 53.2% of cases. All patients received symptomatic treatment and psychotherapy, 42.5% received chemotherapy, and 12.4% underwent mastectomy. There is a significant link between the treatment received and clinical progression.

Conclusion: Patients consulted at an advanced stage of the disease. Chemotherapy, mastectomy, hormone therapy, and radiation therapy were performed. There was a statistically significant link between the treatment received and clinical progression.

DOI : <https://doi.org/10.64294/jsd.v3i4.183>

Introduction

L'incidence du cancer du sein varie selon de nombreux critères dont la région géographique, l'origine ethnique, le mode de vie et les catégories socio-économiques. Actuellement, on peut estimer son incidence à plus d'un million de cas par an à l'échelle mondiale [1]. Le cancer du sein fait partie des cancers les plus graves avec une mortalité non négligeable. Sur 100 femmes qui meurent d'un cancer, 25 sont atteintes du cancer du sein [1]. Au Togo, selon une étude menée en 2020, le cancer du sein est le premier cancer chez la femme et constitue actuellement un enjeu de santé publique [2]. A l'heure où les thérapeutiques innovantes se multiplient pour le cancer du sein, des pays moins nantis accusent encore un retard considérable dans sa prise en charge globale. Dans ces pays et particulièrement au Togo, on reste confronté à la découverte tardive des cancers du sein (75%). Cette situation expose la patiente à un traitement plus mutilant, plus long, plus coûteux, moins supportable avec des chances de guérison plus faibles. En plus de la chirurgie, il faudra souvent recourir à la chimiothérapie, radiothérapie, hormonothérapie, immunothérapie, aux traitements palliatifs, à la psychothérapie et aux contraintes de la surveillance. Tel est le parcours habituel des patientes atteintes de cancer du sein dans les pays pauvres ou à revenus intermédiaires [1,2]. Le but du travail était d'étudier la prise en charge du cancer du sein dans l'Unité d'Oncologie Gynécologique du CHU SO de 2019 à 2023.

Matériel et méthodes

Il s'est agi d'une étude transversale à visée descriptive, allant du 1er Janvier 2019 au 31 Décembre 2023 soit une période de 5 ans. L'étude a concerné les patientes ayant fait un cancer du sein confirmé par un examen anatomopathologique et qui ont été prise en charge dans l'Unité d'Oncologie Gynécologique du CHU SO, pendant la période d'étude. N'ont pas été incluses, les patientes dont les dossiers étaient incomplets et celles qui ont consulté pour des lésions fortement suspectes de malignité du sein sans preuve histologique. Les variables étudiées étaient les données sociodémographiques, les antécédents, les données cliniques, les données sur l'examen anatomopathologique et l'imagerie, et les données de la prise en charge. Une autorisation N° 0696/2024MSHP/CHU-SO/DIR/DRH/SERV/PERS a été obtenue avant le début de la collecte. Les données ont été recueillies à l'aide d'une fiche d'enquête individuelle préétablie sous anonymat avec attribution d'un numéro et prétesté. Les données ont été collectées dans les dossiers individuels des patientes et ont été traité à l'aide du logiciel Microsoft Excel 2010. La saisie des données avait été faite à l'aide du logiciel Microsoft Word 2010. Les variables ont été comparées grâce aux tests Chi carré ou

Fisher avec comme seuil de significativité une valeur de p inférieure à 0,05.

Résultats

Nous avons enregistré au total 779 consultations pour cancers dont 282 pour cancer du sein. Ce qui fait une fréquence hospitalière de 36,2%. L'âge moyen des patientes était de $54,4 \pm 12,9$ ans avec des extrêmes de 30 et 87 ans. Elles étaient mariées dans 35,1 % et 31,9% des revendeuses. Les patientes n'avaient jamais allaité dans 30,9 % des cas et 28,7 % avaient un antécédent familial de cancer du sein (Tableau I).

Tableau I : caractéristiques de la population

Variables	Effectif	%
Age (années)		
[30-45[	87	30,9
[45-55[	48	17,0
[55-65[	78	27,7
>= 65	69	24,5
Statut matrimonial		
Mariée	99	35,1
Veuve	81	28,7
Concubinage	78	27,7
Célibataire	24	8,5
Occupation		
Revendeuse	90	31,9
Sans profession	66	23,4
Femme au foyer	57	20,2
Coiffeuse	33	11,7
Couturière	24	8,5
Fonctionnaire	12	4,3
Facteurs de risque		
Absence d'allaitement maternel	87	30,9
Nullipare	83	29,4
Antécédents familiaux de cancer du sein	81	28,7
Age de ménopause après 50	36	12,8
Obésité (obésité modérée classe 1)	30	10,6
Age de ménarche avant 12 ans	63	22,3
Contraceptifs hormonaux > 1an	60	21,3
Alcool	46	16,3
Antécédents personnels de pathologies mammaires bénignes	33	11,7
Age de la première grossesse après 35 ans	36	12,8

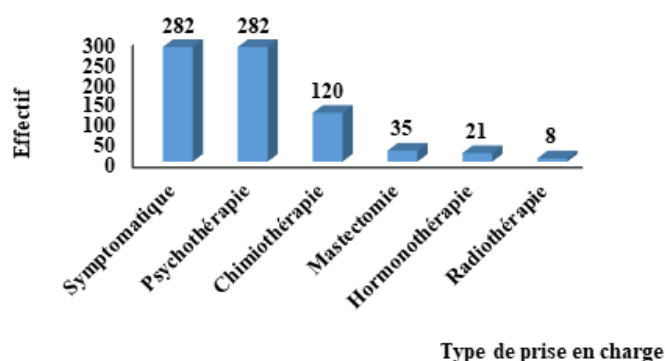
Le délai moyen de consultation des patientes était de $6,1 \text{ mois} \pm 2,1 \text{ mois}$ avec des extrêmes de 2 mois et 2 ans ; 34 % ont évoqué le traitement traditionnel comme motif de retard de consultation. Les anomalies cutanées étaient retrouvées chez 71,3% des patientes (Tableau II). L'aspect échomammographique BIRADS 5 était représenté dans 53,2 % des cas et dans 46,8 % des cas pour le BIRADS 4. Le carcinome canalaire invasif de type

non spécifique était retrouvé dans 94,6% des cas, avec un grade histopronostique SBR III dans 55,3%. Le carcinome lobulaire invasif dans 5,05% des cas, et dans 0,35% la maladie de Paget.

Tableau II : aspects cliniques

Variables	Effectif	%
Délai de consultation (mois)		
[0-6[	63	22,3
[6-12[	96	34,0
>=12	123	43,6
Motif de retard de consultation		
Aucun motif	174	61,7
Traitement traditionnel	96	34,0
Automédication	36	12,8
Prière	66	23,4
Signes physiques		
Masse mammaire	282	100,0
Adénopathie axillaire	276	97,9
Peau d'orange	231	81,9
Ecoulement mamelonnaire	228	80,9
Manœuvre de Tillaux positive	211	74,8
Anomalies cutanées	201	71,3
Ulcération	87	30,9
Nodules de perméation	45	16,0
Rétraction du mamelon	36	12,8
Taille de la masse		
T2	9	3,2
T3	21	7,4
T4	252	89,4
Ganglions lymphatiques		
N0	3	1,1
N1	165	58,5
N2	114	40,4

Les patientes avaient réalisé l'immunohistochimie dans 58,5 % des cas. Le profil immunohistochimique sous type triple négatif était retrouvé chez 37,9% des patientes. Les patientes avaient développé des métastases multiples dans 48,9 % des cas. Toutes les patientes avaient bénéficié d'un traitement symptomatique et d'une psychothérapie (Figure 1).

**Figure 1 : répartition des patientes selon le type de prise en charge**

Il existe un lien significatif entre le traitement reçu et l'évolution clinique (Tableau III).

Tableau III: répartition des patientes selon l'état d'évolution et le type de prise en charge

	Etat d'évolution			p
	Vivante	Perdue de vue	Décédée	
	n(%)	n(%)	n(%)	
Symptomatique	156(55,3)	72(25,5)	54(19,1)	-
Psychothérapie	156(55,3)	72(25,5)	54(19,1)	-
Chimiothérapie	108(90)	9(7,5)	3(2,5)	<0,001
Mastectomie	36(92,3)	0(0)	3(7,7)	<0,001
Hormonothérapie	21(100)	0(0)	0(0)	<0,001
Radiothérapie	15(100)	0(0)	0(0)	0,002

p statistiquement significatif si $p < 0,005$ le p valu, était en comparaison entre les patientes qui avaient reçu soit la chimiothérapie, la mastectomie, l'hormonothérapie et ou la radiothérapie avec leur état d'évolution (vivante, perdue de vue, décédée).

Discussion

La prévalence hospitalière était de 35,2%. Ce taux est similaire à celui relevé dans la littérature où le cancer du sein, est le cancer le plus fréquent chez la femme [3]. Ce résultat est supérieur à celui de Darre et al. en 2013 qui était de 12,4% [4]. Ce taux élevé de cancer du sein pourrait être expliqué par le fait que les femmes togolaises sont de plus en plus sensibilisées sur la pathologie, surtout avec « le programme d'octobre Rose ».

L'âge moyen des patientes était de 54,4 ans avec des extrêmes de 30 et 87 ans. Ces résultats sont proches de ceux de Fouhi et al. au Maroc en 2020, qui avaient rapporté l'âge moyen de 51,6 ans [5]. Nos résultats sont supérieurs à ceux rapportés par Zongo et al. (43,84 ans) au Burkina-Faso [6].

Le délai moyen de consultation des patientes étaient de 6,1 mois $\pm$ 2,1 mois avec des extrêmes de 2 mois et 2 ans. Nos résultats sont similaires à ceux de Liman et al. en 2016 en Tunisie qui avaient rapporté un délai de 240 jours [7], mais ces résultats sont supérieurs à ceux de Essiben et al. [8] en 2020 au Cameroun, qui rapportaient un délai de 60 jours. En effet, les croyances socioculturelles, le manque de moyens financiers et l'ignorance de la maladie font que les patientes consultent tardivement après un long parcours chez les tradipraticiens, maisons de prière, et parfois une automédication.

Le carcinome canalaire invasif de type non spécifique, était retrouvé dans 94,6 % avec un grade histopronostique SBR III retrouvé dans 55,3%. Nos résultats sont similaires à ceux de Adani-ifè et al. [3], qui rapportaient comme sous-type histologique prédominant du cancer du sein, le carcinome canalaire invasif de type non spécifique (95,7 %) avec un grade histopronostique SBR II dans 51,3 %. Ces résultats sont rapportés dans la littérature, où, le carcinome canalaire de type non spécifique

du sein est la forme la plus fréquente des cancers du sein 70 % [9]. Les patientes avaient réalisé l'immunohistochimie dans 58,5 % des cas. Le sous type triple négatif était retrouvé chez 37,9 % des patientes. Adani-ifè et al. en 2020 [2], avait rapporté la réalisation de l'immunohistochimie dans 36,8 % des cas, avec un sous type triple négatif de 37,6 %. Ce taux de réalisation de l'immunohistochimie pourrait s'expliquer par l'effectivité de cette analyse à Lomé depuis 2021.

Toutes les patientes avaient reçu un traitement symptomatique et une psychothérapie. Le diagnostic du cancer du sein fait peur, certaines patientes peuvent développer une dépression. La prise en charge psychologique des patientes atteintes de cancer du sein est indispensable dans le traitement de cette affection.

Les patientes avaient reçu une chimiothérapie dans 42,5 %. Nos résultats sont similaires à ceux de Mahjoub et al. en Tunisie qui rapportaient un taux de 37,7% pour la chimiothérapie [10]. Les drogues de la chimiothérapie coutent très chères dans nos milieux et sont parfois non disponibles à Lomé [11]. Aussi le suivi biologique demande la réalisation de certaines analyses qui coûtent aussi chères. La mastectomie et curage axillaire ont été réalisés dans 89,7 % des cas. Sacko et al. en 2014, rapportaient un taux de 69,6 % [12]. Malgré ce résultat, des efforts restent à conjuguer pour arriver à opérer toutes les patientes en situation non métastatiques et aussi leur offrir une chirurgie conservatrice. Avec ce stade évolutif de la maladie, seulement 22,6 % des patientes avaient pu faire la radiothérapie. Mahjoub et al. en Tunisie avait rapporté un taux de 92,0 % de la radiothérapie [10]. Le Togo ne dispose à ce jour que d'un seul centre de radiothérapie, aussi le prix de la radiothérapie est souvent prohibitif. Nous avons observé un lien significatif entre le traitement reçu (que ce soit la chimiothérapie, la mastectomie, l'hormonothérapie et ou la radiothérapie) et l'évolution clinique ($p=0,001$).

Conclusion

Le cancer du sein est un véritable problème de santé publique. Les patientes avaient toutes reçu un traitement symptomatique et une psychothérapie. La chimiothérapie, la mastectomie, l'hormonothérapie et la radiothérapie étaient faites à des proportions variables. Il existait un lien statistiquement significatif entre le traitement reçu et l'évolution clinique. La nécessité de consulter à temps ainsi que l'amélioration du plateau technique des hôpitaux s'avèrent urgentes pour améliorer la prise en charge.

Remerciements : A l'équipe de gynécologie B de la clinique de Gynécologie – Obstétrique du CHU SO

Contributions des auteurs

Conception de l'étude, étude de terrain, collecte, analyse et interprétation des données, et rédaction du manuscrit : Améyo

Ayoko Ketevi, Conception de l'étude, étude de terrain, collecte, analyse et interprétation des données : Fabien Musengelwa Basubi, Révision du manuscrit : Kossi Edem Logbo-Akey, Komlan Alessi Andele, Lecture du manuscrit : Baguilane Douaguibe, Akila Bassowa, Dédé Régine Diane Ajavon, Supervision du manuscrit : Abdoul Samadou Aboubakari et Koffi Akpadza

Déclaration des conflits d'intérêts : Il n'y a aucun conflit d'intérêt.

Références :

1. Kane SM, Gueye M, Coulbary SA, Diouf A, Moreau JC. Problématique de la prise en charge des cancers du sein au Sénégal : une approche transversale. *Pan African Medical Journal*. 2024 ; 25(16) disponible sur : <http://www.panafrican-med-journal.com/content/article/25/3/full>
2. Adani-Ifè, A., Amégbor, K., Doh, K et Dare T. Cancer du sein chez les femmes togolaises : sous-types d'immunohistochimie. *BMC Women's Health* 20, 261 (2020). <https://doi.org/10.1186/s12905-020-01130-2>
3. Guendouz H, Chetibi W, Abdelouahab A et Bendib A. Cancer du sein de la femme de moins de 35 ans : étude rétrospective à propos de 612 cas. *La Lettre du Sénologue* n°52 - avril-mai-juin 2011. 28-32.
4. Darré T, Tchaou M, Djiwa T, Douaguibe B, Bassowa A, Adani-Ifè S, et al. Breast Cancer in Togolese Women: Imaging and Clinicopathological Findings. *Breast Cancer*. 2021; 15 (1-7).
5. Fouhi ME, Benider A, Kagambega Z.A.S. et Mesfioui A. Profil épidémiologique et anatomopathologique du cancer de sein au CHU Ibn Rochd, Casablanca. *Pan African Medical Journal*. 2020 ; 37(41).
6. Zongo.N, Millogo-Traore.TFD, Bagre SC, Bagué.A.H, Ouangre.E, Zida. M, et al : Place de la chirurgie dans la prise en charge des cancers du sein chez la femme au Centre Hospitalier Universitaire Yalgado Ouédraogo propos de 81 cas. *Pan African Medical*. 2015 ; 22 (117).
7. Limam M, Ajmi T, Zedini C, Khelifi A, Mellouli M, Ghardallou ME, et al. Étude des délais de traitement du cancer du sein à Sousse, Tunisie. *La Revue Sante Publique*. 2016 ; 28(3) :331-40.
8. Essiben, F., Foumane, P., Meka, EJ, Tchakounté, M., Dohbit, JS, Nsahlaï et al. (2017). Analyse descriptive de 192 cas de cancer du sein survenus avant 40 ans à Yaoundé, au Cameroun. *Revue internationale de reproduction, de contraception, d'obstétrique et de gynécologie*, 6 (7), 2704–10. <https://doi.org/10.18203/2320-1770.ijrcog20172898>
9. Mahjoub N, Ben Salem K, Mokrani A, Mansouri H, Achouri L, Chraïet N, Fehri R. Epidemiological and anatomopathological profile of breast cancer in the region of North-West of Tunisia. *Tunis Med*. 2021 Avril;99(4):441-448. English. PMID: 35244929; PMCID: PMC8734481.
10. Ketevi A A, Adani-Ifè S, Sena AK, Bessolo L, Bassowa A., Edem L.A, et al (2023) Direct Medical Cost of Breast Cancer Care in Lome: Case of Sylvanus Olympio University Hospital and International Cancer Centre. *Open Access Library Journal*, 10: e10724. <https://doi.org/10.4236/oalib.1110724>
11. Sacko O, Keita S, Dembele AS, Soumare L, Camara A et Koumare S. Prise en charge du Cancer du sein dans le service de Chirurgie du CHU du Point G. *Bulletin Medical d'Owendo*. 2018. 16(44) : 57-62.



Factors associated with infertility in women less than 25 years

Facteurs associés à l'infertilité chez les femmes de moins de 25 ans

Nsahlai CJ^{1,2}, Dohbit Sama J^{1,3}, Metogo Ntsama JA^{1,4}, Mpono Emenguele P^{1,4}, Nyada SR^{1,4},
Ngoni Akam Marga V^{1,4}, Mboua Batoum VS^{1,5}, Ebong Ebontane C^{1,6}, Mve Koh V^{1,5}

Original Article

1. Department of Obstetrics and Gynecology, Faculty of Medicine and Biomedical Sciences, The University of Yaoundé I,
2. Essos Hospital Center, Yaoundé
3. Yaoundé Gynaeco-Obstetric and Pediatric Hospital
4. Gynecological Endoscopic Surgery and Human Reproductive Teaching Hospital, Yaoundé
5. University Teaching Hospital
6. Yaoundé Central Hospital

Corresponding author:

Christiane Jivir Fomu Nsahlai,
Faculty of Medicine and Biomedical Sciences, The University of Yaoundé I, PO Box 1364, Yaoundé. Tel : (+237) 670 217 703, Email: cnsahlai1974@gmail.com; christiane.nsahlai@fmsb-uy1.cm

Key words: subfertility ; young women; Cameroun

Mots clés : infertilité ; jeunes femmes ; Cameroun

Date de soumission: 22/10/2025

Date d'acceptation: 27/11/2025

ABSTRACT

Background: Infertility among women at peak reproductive potential, is a growing concern in resource-limited settings. Preventable causes like untreated sexually transmitted infections (STIs), unsafe abortions, and postpartum infections are common. This study examined factors associated with infertility in young women in Yaoundé.

Methodology: We conducted a retrospective case-control study of 150 women aged 21–25 years from two referral hospitals between 1st January and 31st December 2021. Cases: women consulting for infertility (n = 75) and controls: postpartum women matched by age (n = 75). Data were analyzed using Chi-square/Fisher's exact tests and multivariate logistic regression. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were calculated; significance was $p < 0.05$.

Results: Primary infertility accounted for 81.3% of cases. Leading causes included genital tract infections (47.5%), tubal obstruction/adhesions (22.0%), and polycystic ovary syndrome (11.9%). Independent predictors of infertility were being in union (AOR 8.08, 95% CI 2.34–27.94), unemployment (AOR 67.21, 95% CI 3.76–1201.49), precocious menarche (AOR 9.30, 95% CI 1.03–83.86), history of STI (AOR 8.52, 95% CI 1.56–46.58), obesity (AOR 64.85, 95% CI 4.41–953.59), and alcohol use (AOR 45.41, 95% CI 8.79–234.76). Secondary education was protective (AOR 0.14, 95% CI 0.03–1.06). Financial barriers prevented diagnostic evaluation in 21.3% of cases.

Conclusion: Infertility is strongly linked to preventable and modifiable factors. Interventions focused on STI prevention, lifestyle modification, reproductive health education, and reducing financial barriers are essential to mitigate this burden.

RESUME

Contexte : L'infertilité chez les jeunes femmes est une préoccupation majeure. Les infections sexuellement transmissibles (IST) non traitées, les avortements à risque et les infections post-partum sont fréquents. Le but de cette étude était d'examiner les facteurs associés à l'infertilité chez les jeunes femmes à Yaoundé.

Méthodologie : une étude cas-témoins rétrospective a été menée auprès de 150 femmes âgées de 21 à 25 ans dans deux hôpitaux entre janvier et décembre 2021. Les cas étaient des femmes consultant pour infertilité (n = 75) et les témoins des femmes en post-partum appariées par âge (n = 75). Les données ont été analysées par tests du chi carré ou exact de Fisher et régression logistique multivariée. Le ratio comparatif ajusté (RCA) et l'intervalle de confiance (IC) à 95 % ont été calculés avec $p < 0,05$.

Résultats : L'infertilité primaire représentait 81,3 % des cas. Les principales causes étaient les infections génitales (47,5 %), les adhérences tubaires (22,0 %) et le syndrome des ovaires polykystiques (SOPK) (11,9 %). Les facteurs prédictifs incluaient la vie en couple (RCA 8,08), le chômage (RCA 67,21), la ménarche précoce (RCA 9,30), les IST (RCA 8,52), l'obésité (RCA 64,85) et l'alcool (RCA 45,41).

Conclusion : L'infertilité chez les jeunes femmes est liée à des facteurs modifiables. Les stratégies de prévention des IST, l'éducation reproductive sont essentielles pour en réduire le fardeau.

DOI : <https://doi.org/10.64294/jsd.v3i4.184>

Introduction

Infertility, defined as the inability to achieve pregnancy after 12 months of regular unprotected intercourse (or 6 months in women over 35), is a growing concern among women under 25 years—a demographic traditionally considered to be at peak reproductive potential. Although infertility affects about one in six people worldwide, recent evidence shows a rising trend across all age groups, including younger women (1).

According to the World Health Organization (WHO), infertility affects approximately 17.5% of the global adult population, with similar rates across high-, middle-, and low-income countries (2). In France, infertility prevalence is estimated at 15.6%, with rates among women aged 18–29 ranging from 7% to 13% (3). A 2021 study in Iran reported a prevalence of 7.88%, which is 1.3 to 1.9 times higher than previous national estimates (4). In Nigeria, Adegbola et al. found an infertility incidence of 26.8% among gynecological consultations (5). In Cameroon, Egbe et al. found a prevalence of 19.2%, with 46.4% of affected women aged 20–29 (6).

In resource-rich settings, subfertility in young women is often linked to lifestyle factors such as obesity, delayed childbearing, and polycystic ovary syndrome (PCOS), with access to advanced diagnostic and treatment options like assisted reproductive technologies (ART). However, despite technological advances, rising rates of emotional distress and delayed fertility awareness persist among young women that setting (7).

Conversely, in resource-poor settings, subfertility is frequently driven by preventable causes such as untreated sexually transmitted infections, unsafe abortions, and postpartum infections (8). In Cameroon, Egbe et al. found that the factors that independently increased the risk of infertility in logistic models for women were a history of reproductive tract infection/STI, uterine fibroids, dysmenorrhea, and induced abortion (6). These regions also face significant barriers to care, including limited access to fertility services, high out-of-pocket costs, and pervasive social stigma (1). In many low- and middle-income countries (LMICs), traditional beliefs and lack of reproductive health education further compound the issue, often leading women to seek informal or traditional remedies (1).

As the global burden of female infertility continues to rise—with over 110 million women affected in 2021 alone (9)—understanding the unique challenges faced by younger women, especially in underserved populations, is critical for shaping effective public health strategies and improving reproductive outcomes.

Methods

A retrospective case-control study using medical records, conducted at two referral hospitals in Yaoundé: University Teaching Hospital Yaoundé (CHUY) and Yaoundé Gynecology, Obstetrics, and Pediatrics Hospital (HGOPY). We recruited patients from February to May 2022. Our cases were complete records of women aged 21–25 consulting for infertility, and controls were complete records of women aged 21–25 in immediate postpartum. We excluded records of women <21 or >25 years, or incomplete files. We matched cases and controls by age (± 1 year). Genital tract infection was defined based on patient-reported history of sexually transmitted infection. Tubal obstruction or adhesions were identified by hysterosalpingography and/or laparoscopic exploration. Data were processed using IBM SPSS Statistics version 23.0. Categorical variables were summarized as frequencies and percentages. To identify factors associated with infertility, we performed univariate analysis using the Chi-square test or Fisher's exact test, followed by multivariate analysis using binary logistic regression. Associations were measured using odds ratios (OR) with 95% confidence intervals (CI). A p-value < 0.05 was considered statistically significant.

Results

Distribution of female infertility

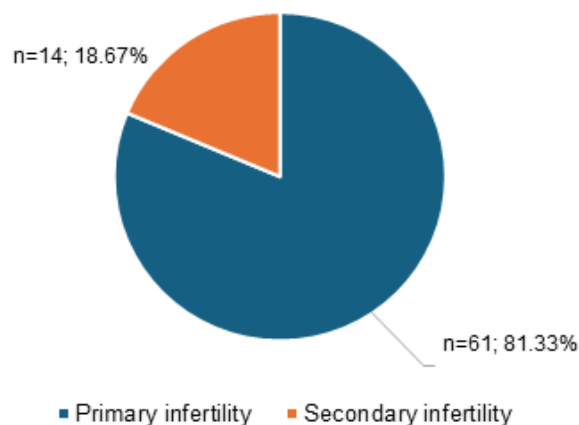


Figure 1. distribution of female infertility

Figure 1 above shows that the most common type of infertility among women under 25 was primary infertility, accounting for 81.3% of cases.

In our study subjects, sixteen patients, or 21.3% of cases, were undiagnosed due to financial constraints resulting in their inability to perform diagnostic examinations. Figure 2 below shows the distribution of causes of female infertility of study participants. The three main causes of female infertility were genital tract infections (47.5%), tubal obstruction/pelvic adhesions (22.0%), and PCOS (11.9%) (Figure 2).

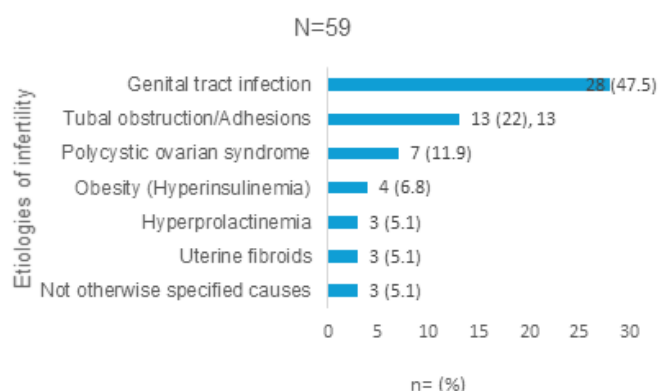


Figure 2. distribution of the population according to causes of female infertility

No significant association was found between age or educational level and infertility among women aged 21–25. However, marital status showed a strong link: unmarried women were significantly less likely to be infertile (OR = 0.24, $p < 0.001$), while being in a relationship was associated with higher odds (OR = 4.21), possibly reflecting greater likelihood of seeking care or diagnosis. Unemployment was strongly associated with infertility (OR = 16.98, $p < 0.001$), suggesting socioeconomic challenges or underlying health issues, whereas private sector employment appeared protective (OR = 0.31, $p = 0.024$). No significant association was observed between place of residence and infertility, likely due to the small number of rural participants (Table 1).

Table 1. Sociodemographic characteristics associated with infertility

Variables	Cases N=75 ; n(%)	Controls N=75 ; n(%)	OR [95% CI]	p-value
Age (in years)				
21	9 (12.0)	14 (18.7)	0.59 [0.24-1.47]	0.183
22	10 (13.3)	12 (16.0)	0.81 [0.33-2.00]	0.409
23	21 (28.0)	17 (22.7)	1.33 [0.63-2.78]	0.287
24	17 (22.7)	19 (25.3)	0.86 [0.41-1.83]	0.424
25	18 (24.0)	13 (17.3)	1.51 [0.68-3.35]	0.210
Marital status				
Unmarried	35 (46.7)	59 (78.7)	0.24 [0.12-0.49]	< 0.001
In a relationship	40 (53.3)	16 (21.3)	4.21 [2.06-8.61]	
Educational level				
Secondary	28 (37.3)	18 (24.0)	1.89 [0.93-3.83]	0.055
Tertiary	47 (62.7)	57 (76.0)	0.53 [0.26-1.08]	
Occupation				
Unemployed	14 (18.7)	1 (1.3)	16.98 [2.17-132.84]	< 0.001
Student	20 (26.7)	19 (25.3)	1.07 [0.52-2.22]	0.500
Informal sector worker	31 (41.3)	32 (42.7)	0.95 [0.50-1.81]	0.500
Public sector employee	5 (6.7)	9 (12.0)	0.52 [0.17-1.64]	0.200
Private sector employee	5 (6.7)	14 (18.7)	0.31 [0.11-0.91]	0.024
Place of residence				
Rural	2 (2.7)	1 (1.3)	2.03 [0.18-22.85]	0.500
Urban	73 (97.3)	74 (98.7)	0.49 [0.04-5.56]	

As shown on Table 2, nulliparity was strongly linked to infertility ($p < 0.001$), with 78.7% of cases having never given birth versus none in the control group. Prior childbirth appeared protective, as primiparity and pauciparity were less common among cases. Voluntary pregnancy termination was more frequent in cases (28.0%) than controls (16.0%), suggesting a possible risk (OR = 2.04), though not statistically significant ($p = 0.057$). Uterine scars were less common in cases (OR = 0.13, $p = 0.032$), but interpretation is limited by sample size. Tubal surgery was significantly associated with infertility (OR = 7.62, $p = 0.032$). No link was found between hormonal contraceptive use and infertility ($p = 0.336$).

Table 2. Obstetrical characteristics associated with infertility

Variables	Case N=75 ; n(%)	Control N=75 ; n(%)	OR [95% CI]	p-value
Parity				
Nulliparous	59 (78.7)	0 (0.0)	/	0.000
Primiparous	10 (13.3)	54 (72.0)	0.06 [0.03-0.14]	0.000
Pauciparous	6 (8.0)	21 (28.0)	0.22 [0.08-0.59]	0.001
Voluntary pregnancy termination				
Yes	21 (28.0)	12 (16.0)	2.04 [0.92-4.53]	0.057
No	54 (72.0)	63 (84.0)	0.49 [0.22-1.09]	
Single uterine scar				
Yes	1 (1.3)	7 (9.3)	0.13 [0.02-1.10]	0.032
No	74 (98.7)	68 (90.7)	7.62 [0.91-63.53]	
History of tubal surgery				
Yes	7 (9.3)	1 (1.3)	7.62 [0.91-63.53]	0.032
No	68 (90.7)	74 (98.7)	0.13 [0.02-1.10]	
Hormonal contraception				
Yes	15 (20.0)	12 (16.0)	1.31 [0.57-3.03]	0.336
No	60 (80.0)	63 (84.0)	1	

Table 3 below shows that precocious menarche (<8 years) was strongly linked to infertility (OR = 6.51, $p = 0.001$), while normal menarche appeared protective (OR = 0.15). Early coitarche (15–16 years) showed a borderline association with infertility (OR = 2.12, $p = 0.053$), and later coitarche (≥ 19 years) suggested a possible protective effect (OR = 0.53, $p = 0.055$). Primary dysmenorrhea showed no significant link (OR = 0.93, $p = 0.500$). Spaniomenorrhea was exclusive to cases (14.7%), indicating a strong association ($p < 0.001$).

Table 3. Other obstetric characteristics associated with infertility

Variables	Case	Control	OR	p-value
	N=75 ; n(%)	N=75 ; n(%)	[95% CI]	
Menarche				
Precocious (< 8 ans)	16 (21.3)	3 (4.0)	6.51 [1.81-23.41]	0.001
Normal [8-13]	59 (78.7)	72 (96.0)	0.15 [0.04-0.55]	
Age at coitarche				
15-16	20 (26.7)	11 (14.7)	2.12 [0.93-4.80]	0.053
17-18	37 (49.3)	36 (48.0)	1.06 [0.56-2.00]	0.500
≥ 19	18 (24.0)	28 (37.3)	0.53 [0.26-1.08]	0.055
Primary Dysmenorrhea				
Yes	19 (25.3)	20 (26.7)	0.93 [0.45-1.94]	0.500
No	56 (74.7)	55 (73.3)	1	
Spaniomenorrhea				
Yes	11 (14.7)	0 (0.0)	/	< 0.001
No	59 (78.7)	75 (100.0)	/	

PCOS and uterine fibroids were found only in cases (9.3%, $p = 0.007$), indicating a strong link to infertility. Dyspareunia (10.7% vs. 1.3%, $OR = 8.83$, $p = 0.017$) and STIs (41.3% vs. 13.3%, $OR = 4.58$, $p < 0.001$) were significantly more common in cases. Among STIs, chlamydia ($p = 0.029$) and gonococcus ($p = 0.003$) were strongly associated with infertility, while syphilis showed borderline significance ($p = 0.060$) and mycoplasma showed no difference ($p = 0.641$) (Table 4).

Table 4. Gynecological characteristics associated with infertility

Variables	Case N=75 ; n(%)	Control N=75 ; n(%)	OR [95% CI]	p-value
Gynecological history				
PCOS*	7 (9.3)	0 (0.0)	/	0.007
Uterine fibroids	7 (9.3)	0 (0.0)	/	0.007
Dyspareunia	8 (10.7)	1 (1.3)	8.83 [1.08-72.51]	0.017
STI**	31 (41.3)	10 (13.3)	4.58 [2.04-10.28]	< 0.001
Type of STI				
Chlamydiae	15 (20.0)	6 (8.0)	2.88 [1.05-7.88]	0.029
Syphilis	4 (5.3)	0 (0.0)	/	0.060
Mycoplasma	4 (5.3)	4 (5.3)	1.00 [0.24-4.16]	0.641
Gonococcus	8 (10.7)	0 (0.0)	/	0.003

*Polycystic Ovarian Syndrome ; **Sexually Transmitted Infection

As shown on Table 5, obesity was strongly linked to infertility (21.3% vs. 1.3%, $OR = 20.07$, $p < 0.001$), while HIV showed no association. Alcohol use (57.3% vs. 10.7%, $OR = 11.25$) and tobacco use

(16.0% in cases only) were significantly associated with infertility (both $p < 0.001$).

Table 5. Comorbidities and toxicological history associated with infertility

Variables	Case N=75 ; n(%)	Control N=75 ; n(%)	OR [95% CI]	p-value
Comorbidity				
Obesity	16 (21.3)	1 (1.3)	20.07 [2.59-155.74]	< 0.001
HIV* Infection	2 (2.7)	2 (2.7)	1.00 [0.14-7.29]	0.690
Toxicological history				
Alcohol consumption	43 (57.3)	8 (10.7)	11.25 [4.74-26.71]	< 0.001
Tobacco use	12 (16.0)	0 (0.0)	/	< 0.001

*Human Immunodeficiency Virus

Table 6 shows a multivariate analysis shows both socio-demographic and clinical determinants of female infertility. Significant risk factors ($p < 0.05$) include being in union (AOR 8.08), unemployed (AOR 67.21), precocious menarche (AOR 9.30), history of STIs (AOR 8.52), obesity (AOR 64.85), and alcohol consumption (AOR 45.41). In contrast, tubal surgery and chlamydia infection were not independent factors, while secondary education appeared protective (AOR 0.14).

Table 6. Independent factors associated with female infertility

Variables	Case N=75 ; n(%)	Control N=75 ; n(%)	OR [95% CI]	Adjusted p-value
Marital status				
In union	40 (53.3)	16 (21.3)	8.08 [2.34-27.94]	0.001
Educational level				
Secondary	28 (37.3)	18 (24.0)	0.14 [0.03-1.06]	0.021
Occupation				
Unemployed	14 (18.7)	1 (1.3)	67.21 [3.76-1201.49]	0.004
Private sector employee	5 (6.7)	14 (18.7)	0.12 [0.02-20.67]	0.021
Voluntary abortion				
Yes	21 (28.0)	12 (16.0)	0.44 [0.08-2.36]	0.339
History of tubal surgery				
Yes	7 (9.3)	1 (1.3)	0.68 [0.02-20.67]	0.823

Variables	Case	Control	OR	Adjusted
	N=75 ; n(%)	N=75 ; n(%)	[95% CI]	p-value
Menarche				
Precocious (<8 ans)	16 (21.3)	3 (4.0)	9.30 [1.03-83.86]	0.047
Coitarche				
15-16	20 (26.7)	11 (14.7)	2.11 [0.47-9.37]	0.328
≥ 19	18 (24.0)	28 (37.3)	0.26 [0.07-1.04]	0.057
Gynecological history				
Dyspareunia	8 (10.7)	1 (1.3)	23.47 [0.77-713.0]	0.070
STI*	31 (41.3)	10 (13.3)	8.52 [1.56-46.58]	0.013
Type of STI				
Chlamydiae	15 (20.0)	6 (8.0)	0.63 [0.06-6.60]	0.698
Comorbidities				
Obesity	16 (21.3)	1 (1.3)	64.85 [4.41-953.59]	0.002
Toxicological history				
Alcohol consumption	43 (57.3)	8 (10.7)	45.41 [8.79-234.76]	< 0.001

*Sexually Transmitted Infection

Discussion

This case–control study of women aged 21–25 in Yaoundé underscores that infertility in very young women is multifactorial, with strong contributions from socio-economic status, infections, and modifiable lifestyle factors. This is highlighted in Table 1, which shows that age alone is not significantly associated with infertility. In multivariable models, unemployment, precocious menarche, prior STI, obesity, and alcohol use independently increased infertility odds, while secondary education appeared protective; notably, chlamydia and prior tubal surgery were not independent predictors in the adjusted model.

The scale of infertility in our study corroborates WHO estimates (~17.5% of adults experience infertility), and the barriers to affordable care mirror WHO’s call for expanded access—particularly salient in LMIC contexts like Cameroon (10). In our study, 21.3% participants were unable to afford diagnostic examinations.

In this cohort, primary infertility predominated (81.3%), contrasting with many sub-Saharan African series where secondary infertility is often more common due to post-infectious tubal damage from

unsafe abortion, postpartum infection, and untreated STIs (11). This divergence may reflect cohort age (≤25 years), earlier care-seeking in urban settings, and differential exposure windows to postpartum/postabortal infections.

The strong adjusted association between history of STI and infertility in our data aligns with extensive evidence that chlamydia and gonorrhea drive pelvic inflammatory disease (PID), tubal factor infertility (TFI), and ectopic pregnancy (12,13). While chlamydia did not remain an independent predictor in our adjusted model—likely due to sample size and collinearity with “any STI”—large cohort and review data continue to demonstrate elevated risks of PID and TFI after prior chlamydia infection (5,13).

Our finding that precocious menarche was independently associated with infertility echoes emerging literature linking non-normative menarche (early or late) with reduced fecundability and adverse gynecologic outcomes, though directionality can vary across populations (14). Evidence remains mixed—with some cohorts reporting higher infertility with later menarche—suggesting that biological (e.g., ovarian reserve, endocrine milieu) and social pathways (e.g., early sexual debut, STI exposure) may differ by context (10). In LMICs, early menarche has also been tied to earlier sexual initiation and STI risk, reinforcing a plausible behavioral link to infertility (15).

Regarding obesity, the very large adjusted effect of obesity observed here is directionally consistent with reviews showing that excess adiposity impairs ovulation, increases menstrual dysfunction, and reduces fecundability (16). The magnitude in our model likely reflects small numbers and residual confounding, but it highlights an important, modifiable target for prevention and preconception care.

The strong adjusted association between alcohol consumption and infertility is broadly concordant with meta-analytic evidence linking female alcohol intake with reduced fecundability and lower pregnancy rates (particularly at higher weekly doses), although professional guidance notes heterogeneity across studies (17–19). These nuances suggest dose and pattern (e.g., binge vs. light/moderate) matter and should be captured in future studies. Organic conditions such as PCOS and uterine fibroids were observed only among cases in univariate analyses in our cohort, aligning with global data that PCOS is a leading cause of anovulatory infertility and that its population burden is rising (20,21).

Etiologically, genital tract infections (47.5%), tubal obstruction/adhesions (22.0%), and PCOS (11.9%) dominated, consistent with African literature emphasizing infection-related tubal damage as a major cause (22). Importantly, 21.3% of cases lacked definitive etiologic workups due to financial constraints, underscoring access gaps that likely

attenuate accurate classification and timely treatment.

Given the young age of the affected population, the social and psychological consequences are substantial. Prevention priorities in similar settings include STI screening and treatment, weight management, and alcohol-use reduction, alongside health-literacy interventions and policies that reduce out-of-pocket costs for diagnostic evaluation and fertility services (10).

Strengths include age-matching and multivariable adjustment, which identified independent correlates specific to very young women.

Limitations—retrospective design, modest sample size, hospital-based selection, and incomplete diagnostics—likely contributed to wide confidence intervals and may explain why some expected factors (e.g., chlamydia) lost significance after adjustment.

Conclusion

Among women under 25, infertility reflects an interplay of preventable infections, modifiable lifestyle risks, and socio-economic factors. Aligning clinical pathways (early STI detection and treatment; metabolic risk management; alcohol-use counseling) with financing strategies to complete diagnostics could meaningfully reduce the burden of infertility in this age group.

Conflict of interest: The authors declare that they have no conflicts of interest regarding the publication of this paper.

Author's contributions: Under the supervision of M.K.V and D.S.J, the research protocol, data collection, compilation were performed by M.N.J.A. and C.J.F.N. The latter drafted the initial manuscript, performed data analysis and contributed to interpretation of the results. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

References

- Withers M. Infertility Among Women in Low- and Middle-Income Countries. In: Kickbusch I, Ganten D, Moeti M, editors. *Handbook of Global Health* [Internet]. Cham: Springer International Publishing; 2021 [cited 2025 Sept 9]. p. 885–910. Available from: https://link.springer.com/10.1007/978-3-030-45009-0_43
- World Health Organization. *Infertility Prevalence Estimates, 1990–2021*. 1st ed. Geneva: World Health Organization; 2024. 1 p.
- Ben Messaoud K, Bouyer J, De La Rochebrochard E. Infertility Treatment in France, 2008–2017: A Challenge of Growing Treatment Needs at Older Ages. *Am J Public Health*. 2020 Sept;110(9):1418–20.
- Maharlouei N, Morshed Behbahani B, Doryanizadeh L, Kazemi M. Prevalence and Pattern of Infertility in Iran: A Systematic Review and Meta-Analysis Study. *Women's Health Bulletin* [Internet]. 2021 Apr [cited 2025 Sept 9];8(2). Available from: <https://doi.org/10.30476/whb.2021.89924.1102>
- Adegbola O, Akindele M. The pattern and challenges of infertility management in Lagos, Nigeria. *Afr H Sci*. 2014 Feb 2;13(4):1126.
- Obinchemti Egbe T, Ngo Mbaki C, Tendongfor N, Temfack E, Belley-Priso E. Infertility and associated factors in three hospitals in Douala, Cameroon: a cross-sectional study. *Afr H Sci*. 2020 Dec 16;20(4):1985–95.
- Hoffman JR, Delaney MA, Valdes CT, Herrera D, Washington SL, Aghajanova L, et al. Disparities in fertility knowledge among women from low and high resource settings presenting for fertility care in two United States metropolitan centers. *Fertil Res and Pract*. 2020 Dec;6(1):15.
- Bahamondes L, Makuch MY. Infertility care and the introduction of new reproductive technologies in poor resource settings. *Reproductive Biology and Endocrinology*. 2014 Sept 8;12(1):87.
- Wei Y, Lin Z, Huang Q, Wu H, Wang R, Wang J. Burden of female infertility in 204 countries and territories, 1990–2021: results from the Global Burden of Disease Study 2021. *Journal of Psychosomatic Obstetrics & Gynecology*. 2025 Dec 31;46(1):2459618.
- World Health Organization. Polycystic ovary syndrome. 2025 [cited 2025 Sept 10]. Infertility. Available from: <https://www.who.int/news-room/fact-sheets/detail/infertility>
- Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. *Human Reproduction*. 2007 July 25;22(10):2800–2800.
- Ubaldi F, Rienzi L, Cimadomo D, Vaiarelli A, Romano A, Anniballo R. Subfertility and infertility: definitions and prevalence. In: *Reproductive Medicine: Molecular, Cellular and Genetic Fundamentals*. Fauser BCJM, editor. Springer International Publishing; 2019. p. 171–83.
- Zegers-Hochschild F, Adamson GD, Dyer S, Racowsky C, De Mouzon J, Sokol R, et al. The International Glossary on Infertility and Fertility Care, 2017. *Fertility and Sterility*. 2017 Sept;108(3):393–406.
- Hill JW, Alreja M, Elias CF. From Precocious Puberty to Infertility: Metabolic Control of the Reproductive Function. *Front Endocrinol* [Internet]. 2013 [cited 2025 Sept 12];4. Available from: <http://journal.frontiersin.org/article/10.3389/fendo.2013.00043/abstract>
- Ibitoye M, Choi C, Tai H, Lee G, Sommer M. Early menarche: A systematic review of its effect on sexual and reproductive health in low- and middle-income countries. *Sear R, editor. PLoS ONE*. 2017 June 7;12(6):e0178884.
- Ozcan Dag Z, Dilbaz B. Impact of obesity on infertility in women. *J Turkish German Gynecol Assoc*. 2015 June 4;16(2):111–7.
- Fan D, Liu L, Xia Q, Wang W, Wu S, Tian G, et al. Female alcohol consumption and fecundability: a systematic review and dose-response meta-analysis. *Scientific Reports*. 2017 Oct 23;7(1):13815.
- Mikkelsen EM, Riis AH, Wise LA, Hatch EE, Rothman KJ, Cueto HT, et al. Alcohol consumption and fecundability: prospective Danish cohort study. *BMJ*. 2016 Aug 31;4262.
- Rao W, Li Y, Li N, Yao Q, Li Y. The association between caffeine and alcohol consumption and IVF / ICSI outcomes: A systematic review and dose–response meta-analysis. *Acta Obstet Gynecol Scand*. 2022 Dec;101(12):1351–63.
- Polycystic ovary syndrome [Internet]. [cited 2025 Sept 12]. Available from: <https://www.who.int/news-room/fact-sheets/detail/polycystic-ovary-syndrome>
- Huo M, Wang Y, Yuan X, Yuan Y, Zhang X. Changing trends in the global burden of polycystic ovarian syndrome-related

- infertility over the past 30 years: retrospective data analysis of the global burden of disease study 2019. *BMC Women's Health*. 2025 Jan 23;25(1):35.
22. Ambildhuke K, Pajai S, Chimegave A, Mundhada R, Kabra P. A Review of Tubal Factors Affecting Fertility and its Management. *Cureus* [Internet]. 2022 Nov 1 [cited 2025 Sept 12]; Available from: <https://www.cureus.com/articles/121570-a-review-of-tubal-factors-affecting-fertility-and-its-management>



Clinical, biological, morphological and histological profile of prostate cancer at the Central Hospital in Yaounde

Profil clinique, biologique, morphologique et histologique du cancer de la prostate à l'Hôpital Central de Yaoundé

Fouda JC^{1,2}, Mendouga M.C¹, Mekeme MJB^{1,2}, Nwaha Makon AS¹, Essama P¹, Owon'Abessolo³, Nseme A¹, Bang A¹, Angwafo III Fru¹

Original Article

1. Faculty of Medicine and Biomedical Sciences of University of Yaounde I
2. Urology and Andrology Department of Central Hospital of Yaounde
3. Faculty of Medicine and Pharmaceutical Sciences of University of Douala

Corresponding author: Fouda Jean Cedrick, Faculty of Medicine and Biomedical Sciences of University of Yaounde I, Email: cedrickfouda@gmail.com, Tel: (+237) 675160954

Key words: Prostate Cancer, diagnosis, therapeutic profile, Yaounde Central Hospital

Mots clés : Cancer de la prostate, diagnostic, profil thérapeutique, Hôpital central de Yaoundé

Date de soumission: 19/10/2025
Date d'acceptation: 09/12/2025

ABSTRACT

Introduction: Prostate cancer is a public health problem. In sub-Saharan Africa in general, prostate cancer is diagnosed late. We therefore set out to study the clinical, biological, morphological and histological profile of patients diagnosed with prostate cancer.

Methodology: We conducted a cross-sectional study over a period of 10 years in the Urology Department of the Yaoundé Central Hospital (YCH). We included all patients with a histologically confirmed diagnosis of prostate cancer.

Results: The median age of our patients was 73 years. The most common reason for consultation was acute retention of urine (78.5%). The digital rectal examination was suspicious in 71 patients (54.6%). Haemoglobin levels were below 12 in 76.8% of patients, and PSA levels were above 100 in 70.7%. Urine microscopy and culture found a germ in 96.6% of patients. On TRUS, the prostate had at least one nodule in 70% of cases. Finger-guided prostate biopsy was the most commonly used sampling technique (67.7%); the ISUP prognostic group with the highest representation was group 3 (54.6%); adenocarcinoma was the only histological type found in all cases. Metastases were found in 92.3% of patients. Bone metastases were the most common on CT scan (74.2%). In terms of TNM classification, patients were more likely to be classified as T4N1M1 (64.6%).

Conclusion: Prostate cancer at the Yaounde Central Hospital is synchronous and therefore advanced. There is a need to set up screening policy and a national registry.

RESUME

Introduction : Le cancer de la prostate est un problème de santé publique. Le but de l'étude était d'étudier le profil clinique, biologique, morphologique et histologique des patients diagnostiqués avec un cancer de la prostate.

Méthodologie : Il s'agissait d'une étude transversale sur une période de 10 ans dans le service d'urologie de l'hôpital central de Yaoundé (HCY). Etaient inclus tous les patients ayant un diagnostic de cancer de la prostate confirmé histologiquement.

Résultats : L'âge médian de nos patients était de 73 ans. Le principal motif de consultation était la rétention aiguë d'urine (78,5 %). Le toucher rectal était suspect chez 71 patients (54,6%). Le taux de PSA était supérieur à 100 (70,7 %). La culture de l'urine retrouvait un germe (96,6 %). La biopsie prostatique guidée par le doigt était la technique d'échantillonnage la plus utilisée (67,7 %). Le groupe pronostique de l'ISUP le plus représenté était le groupe 3 (54,6 %). L'adénocarcinome était le seul type histologique retrouvé. Des métastases ont été trouvées chez 92,3 % des patients. Les métastases osseuses étaient les plus fréquentes au scanner (74,2 %). Les patients étaient classés T4N1M1 (64,6 %).

Conclusion : Le cancer de la prostate à l'hôpital central de Yaoundé est synchronique et donc avancé. Il est nécessaire de mettre en place une politique de dépistage et un registre national.

DOI : <https://doi.org/10.64294/jsd.v3i4.185>

Introduction

Prostate cancer is the second most common cancer in men after bronchopulmonary cancers [1]. It is currently a public health problem, with a frequency that varies from country to country [2]. It affects people aged over 50 [3]. The causes remain unknown, but gender, age, ethnic origin, family history of Prostate cancer and breast cancer, genetic factors and testosterone metabolism are established risk factors. The incidence of Prostate cancer varies widely from one continent to another. The incidence rate of PCa varies more than 25-fold worldwide; generally it is higher in Western countries and lower in Asian countries. [4 Northern Europe had the highest estimated incidence rate (82.8 per 100 000 men) and Southern Africa had the highest mortality rate (29.7 per 100 000 men). South-Central Asia had the lowest rates for both incidence (6.4 per 100 000 men) and mortality (3.1 per 100 000 men). At the country level, the highest incidence rates were found in Australia, New Zealand, the USA, Brazil, and several countries in the Caribbean and Northern Europe. By contrast, mortality rates were highest in many sub-Saharan African and Caribbean countries, such as Barbados, Jamaica, and Chad, and were lowest across Asia [5]. In Africa, the highest rates were reported in East Africa with figures of 10.7–38.1 per 100,000 people and the lowest rates were reported in West African countries, at 4.7–19.8 per 100,000 people. [6]. The prevalence of prostate cancer was estimated, In Cameroon, at 7.13% [7]. A study by Sow et al in 2006 found that benign prostatic hyperplasia was the most common tumour pathology [8]. Furthermore, Angwafo et al. reported that prostate cancer is common among black people in Cameroon and its incidence is increasing every year [9]. Prostate cancer is becoming more and more an issue of public concern in Africa due to the fact that the majority of new diagnoses are advanced/metastatic cancers, with poor prognosis and low chances of long-term survival [6]. With this in mind, we proposed to conduct a study of the clinical, biological, morphological and histological profile of prostate cancer at the Yaoundé Central Hospital.

Methodology:

We conducted a descriptive cross-sectional study with retrospective data collection. Our study lasted 7 months from 1 March 2023 to 15 September 2023 and was conducted over a 10-year period from 1 January 2013 to 15 September 2023. Our study population consisted of all patients hospitalized in the Urology and Andrology Department of the Yaoundé Central Hospital (YCH) with a histological diagnosis of prostate cancer. All patients with a histologically confirmed diagnosis of prostate cancer who had received treatment for prostate cancer at YCH were systematically included in our study. All files deemed incomplete were not included in our study.

Several variables were studied: socio-demographic parameters (age of detection of the disease, history, general condition), clinical, biological and histological samples: symptoms; lesions observed and Gleason score and ISUP (International Society of Urological Pathology) grade and TNM stage,

Information was collected using a pre-established questionnaire and entered into the EPI INFO 3.5.1 epidemiology software. Continuous data were analysed using SPSS (Statistical Package of the Social Science) software, Microsoft Excel and Word application software for text processing. The results of our study were described in the form of categorical variables, percentages, proportions and/or frequencies.

We conducted our study in strict compliance with the fundamental principles of medical research. We obtained ethical clearance to carry out this work. Anuria was defined as the absence of urine output for 24 hours, weight loss as a weight loss of more than 10%, asthenia was defined according to the WHO ECOG-PS, post-micturition residual was considered significant when it was greater than 100 ml and the threshold value for CKD was 105 mmol/l.

Results

A total of 1450 patient files were collected in the urology department of Yaoundé Central Hospital. Of these, 130 had a histologically proven diagnosis of prostate cancer (figure 1).

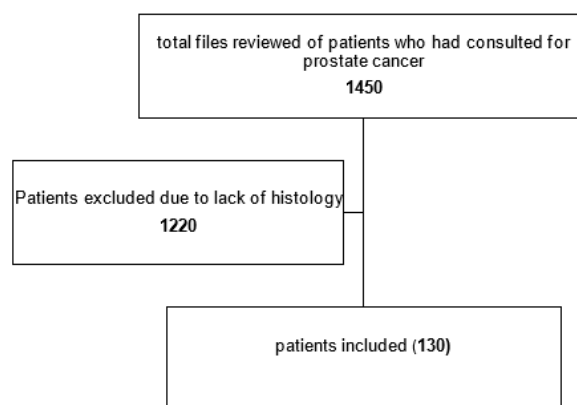


Figure 1: Flow chart

The median age of the study population was 73 years [65–78], with extremes between 48 and 103 years. The most common age group was 70 to 79 years (43.8%), followed by 60 to 69 years (25.4%). Patients under 50 made up 0.8% and those over 80 20.8% (Table 1).

Concerning medical history, hypertension (60%) was the most common comorbidity, followed by sexually transmitted infections (39.2%), diabetes (28.5%) and obesity (22.3%). As for surgical history, hernia repair was the most common (41.9%). 10% of patients were aware of a positive family cancer history, including

prostate cancer (6.1%), breast cancer (0.8%) and other cancers (3.1%). The most common clinical sign at the time of hospital admission was acute urine retention (78.5%), followed by poor performance status with asthenia (74.6%) and bone pain (67.7%).

Table I: Sociodemographic characteristics of study population

Variables	Groups	Number (N)	Percentage (%)
Age (years)	[40 - 49]	1	0,8
	[50 - 59]	12	9,2
	[60 - 69]	33	25,4
	[70 - 79]	57	43,8
	>80	27	20,8
	Total	130	100

Table II: Clinical characteristics of study population based on circumstance of discovery

Variables	Groups	Quantity N = 130	Percentage (%)
AUR	Yes	102	78,5
	No	28	21,5
Bone pain	Yes	88	67,7
	No	42	32,3
Anuria	Yes	28	21,5
	No	102	78,5
Anémia	Yes	21	16,2
	No	109	83,8
CKD	Yes	31	23,9
	No	99	76,1
Asthenia	Yes	97	74,6
	No	33	25,4
Anorexia	Yes	15	11,5
	No	115	88,5
Weight loss	Yes	13	10,0
	No	117	90,0

AUR: acute urinary retention

CKD: Chronic Kidney Disease

The majority of patients prior to hospital admission presented with pollakiuria (43.1%) and dysuria (40%). The digital rectal examination (DRE) was suspicious in 71 patients (54.6%). On ultrasound, the median prostate volume was 56 [35-76] ml, with extremes ranging from 20 to 282 ml. Seventy-one patients (54.6%) had a prostate volume of between 40 and 80 ml. Ureterohydronephrosis was found in 58 patients (44.6%). Post-void residual was found in 103 patients. The median volume was 78.12ml, with an interquartile range of 45 to 191ml and extremes of 0 to 485ml. Patients with a post-void residual of more than 100ml were the most numerous (39.8%). Patients with at least one nodule on ultrasound accounted for 70% of patients.

The most commonly performed morphological examinations were thoraco-abdomino-pelvic CT (TAP scan) in 123 patients (94.6%), followed by prostate MRI in 29 patients (22.3%). All patients who underwent prostate MRI underwent a thoraco-abdomino-pelvic CT scan as assessment for

metastasis after confirmation of prostate cancer diagnosis.

The median total PSA level was 100ng/ml with an interquartile range of 56 to 259.35 and extremes of 2 to 22,000ng/ml. The most representative ranges were 51 to 100ng/ml and 101 to 1000ng/ml. The median haemoglobin level was 9.77 g/dl [7,75-11,55] with a range of 3.33 to 16.8 g/dl. The median urea level was 0.96 mmol/l, with an interquartile range of 0.37 to 3.77 mmol/l and extremes of 0.12 to 34 mmol/l. The median creatinine level was 14.40 mmol/l with an interquartile range of 11.76 and 33.75 and extremes of between and 238 mmol/l. There were 59 patients with elevated creatinine levels, 50.4% of them. The median testosterone level was 15 nmol/ml with an interquartile range of 9 and 32 nmol/ml and extremes between 0.23 nmol/l and 67 nmol/l. Urine microscopy and culture was performed in 117 patients and was abnormal in 96.6%. The germ most frequently found was *Escherichia coli* (70.7%) followed by *Klebsiella p* (14.7%).

Table III: biologic characteristics

Variables	Group	Quantity	Percentage (%)
Total PSA (ng/ml)	N = 130		
	< 4 (normal)	0	0
	[4 - 10]	2	1,5
	[10 - 50]	17	13,1
	[51 - 100]	50	38,5
	[101 - 1000]	46	35,4
Hémoglobine level (g/dl)	n=112		
	> 1000	15	11,5
	< 6,0	7	6,3
	[6,0 –7,9]	22	19,6
	[8,0–11,9]	57	50,9
Urea (mmol/L)	n=115		
	≥ 12	26	23,2
	< 2,5	76	66,1
	[2,5 - 8,3] (normal)	24	20,9
Creatinine (mmol/L)	n=117		
	> 8,3 (high)	15	13,0
	< 7	3	2,6
	[7 - 14] (normal)	55	47,0
Serum Testosterone (nmol /ml)	n=108		
	> 14 (high)	59	50,4
	< 8,2 (low)	19	17,6
	[8,2–34,6] (normal)	63	58,3
	> 34,6 (high)	26	24,1

Finger-guided prostate biopsy was the most commonly used sampling technique (67.7%), followed by TURP chips (20.8%). The histological

type found was prostatic adenocarcinoma (100%).

Bone metastasis was the most represented, 74,2% followed by pulmonary metastasis, 21,6% (Table IV).

Table IV: distribution according to métastases sites

Variables	Groups	Quantity (N)	Percentage (%)
Sites de métastases (n=120)	Bone Metastasis	89	74,2
	Pulmonary Metastasis	26	21,6
	Other sites	5	4,2
Total		120	100

The ISUP 3 group was the most represented at 54.6% and in the TNM classification stage T4N1M1 was the most represented at 64.6% followed by stage T3N1M1 (17.7%) and stage T3N0M1 (8.5%).

Table V: distribution according to TNM and Gleason classifications

Variables	Groups	Quantity (N)	Percentage (%)
Classification TNM	T1N0M0	7	5,4
	T2N0M0	3	2,3
	T3N0M0	2	1,5
	T3N0M1	11	8,5
	T3N1M1	23	17,7
	T4N0M1	0	0
	T4N1M1	84	64,6
Groupe pronostic ISUP	Group1 Gleason 6 (3+3)	12	9,2
	Group 2 Gleason 7 (3+4)	9	6,9
	Group 3 Gleason 7 (4+3)	71	54,6
	Group 4 Gleason 8 (4+4, 5+3,5+3)	27	20,8
	Group 5 Gleason 9 ou 10	11	8,5

Surgical castration (orchidectomy) was the most common treatment (84.6%), followed by radical prostatectomy (9.2%) and hormone therapy (6.2%). All patients in the metastatic stage were on complete androgen blockade, i.e. 93.2% of patients who had undergone orchidectomy and anti-androgen therapy and 6.8% of patients on LHRH analogues and anti-androgen therapy.

Discussion

The mean age of the study population was 72.12 ± 9.12 years, with a minimum age of 48 years and a maximum age of 103 years. The most common age group was 70 to 79 years (43.8%), followed by 60 to 69 years (25.4%). These data are in line with those reported by Mbamba et al. in Mali and Kouka et al. in Senegal, who reported 71.15 ± 9.311 and 72.7 years

respectively [11,12]. In his study, Kouka et al. found that the most representative age group was between 70 and 80 years [12], as did Gueye et al. [13]. This result is like ours. These results show that the age at which prostate cancer is diagnosed is the same in sub-Saharan Africa, and this bears witness to the similar difficulties that sub-Saharan African countries may be experiencing. This may be more striking when we look at the series by Terrier et al. in France, who found a mean age of 58 ± 7 years [14]. This difference in age can be explained by two factors: the awareness campaigns pushed forth by the French health system and the overall level of education in their country and patients under 50 years of age accounted for 0.8% and those over 70 for 64.6%. These figures are similar to those of Kouka et al. [12]. Furthermore, most of these patients are retired and sometimes need external support to carry out examinations and benefit from treatment, which is costly both financially and psychologically.

In our series, acute urinary retention was the main presenting scenario accounting for 78.5% of cases, followed by altered general state notably anaemia in 74.6% of cases, and bone pain (67.7% of cases). Our circumstances of discovery are similar to those of Tengué et al., in Togo, and Ndoeye et al. in Senegal, who found LUTS to be the leading cause in 79.2% and 72% of cases respectively [15,16]. Regarding the impairment in general state and bone pain, our results are similar to those of Ndoeye et al. in Senegal, who found AEG (44%) to be more frequent than bone pain (31.37%) [16]. However, our results differ from those of Tengué et al., who found that prostate cancer was more frequently discovered in patients with bone pain (67.2%) and those with general health impairment (20.4%) [15]. Whatever the circumstances in which prostate cancer is diagnosed in sub-Saharan Africa, it should be considered in the presence of acute urinary retention deterioration in general state and bone pain in an older patient. These signs are also suggestive of advanced prostate cancer.

In contrast, in Rigaud's series in France, the mode of onset was AEG in 5.3% of cases, bone pain in 22.9% and micturition problems aggravated by dysuria in 50.6% of cases [17]. A comparison of the results of our study with those of Rigaud, where prostate cancer is discovered very early (metachronous prostate cancer) [17] reveals some discrepancies. These This is illustrated by the high recurrence of bone pain, altered general state and acute urinary retention (AUR), which would indicate a more aggressive cancer at the time of discovery. This supports Jalloh et al. statement that many men in sub-Saharan Africa (SSA) are diagnosed at advanced stages of the disease [18].

A family history of prostate cancer was known in 6.1% of patients. This figure is similar to that of Kouka et

al. and is not far from Kamadjou et al. who found a frequency of 6.91% and 4.93% respectively [12,19]. The low rate of knowledge of the history of cancer is due to the fact that modern medicine is gradually taking over from traditional medicine, which was practiced more by our fathers. This explanation makes sense when we look at the figures from European countries where modern medicine has been practiced for ages.

Our patients have a history of hypertension, sexually transmitted infections (STIs), abdominal obesity and diabetes (60%, 39.2%, 28.5% and 22.3% respectively). Numerous studies have suggested a link between elements of metabolic syndrome and prostate cancer, such as the study by Anwar E Ahmed et al, who shown that when both obesity measures were combined, the general and abdominal obesity category was associated with a significant increase in the odds of prostate cancer in Black men [20]. Laukkanen et al. found that obese or overweight men had a higher risk of developing prostate cancer [21]. Men over 45 years of age with systolic blood pressure (upper level) greater than 150 mmHg had a 35% higher risk of prostate cancer than men with normal blood pressure. Patients with prostate cancer and hypertension had a 49% higher overall mortality rate. This indicates a link between prostate cancer and hypertension. It has been suggested that type 2 diabetes is associated with a lower risk of prostate cancer [22] however in a recent systematic review there was no association with prostate cancer risk [23]. With regard to the surgical history in our series, herniorrhaphy dominated with a frequency of (29.4%). This result is higher than that of Dolo et al. who reported a frequency of 10.08% and is similar to that of Noutacdie who reported a frequency of 20.57% [24]. The predominance of herniorrhaphies can be due to the frequency of the tertiary sector which is high. This sector require physical effort.

The digital rectal examination was found to be suspicious in 71 patients (54.6%). This result is similar to that of Kouka et al. (55.4%) [12]. According to the literature, Digital Rectal Exam (DRE) has a sensitivity of over 50% [3,15,16]. This may be due to the advanced stage of the disease (Halidou, Ondziel) [3,24].

In our series, the median total PSA level was 100ng/ml with an interquartile range of 56 - 259.35. This result is like that of Tengue et al. (123.5ng/ml) and Sine et al. (97.7ng/ml) [15,25]. Most patients (46.9%) had a PSA greater than 100 ng/ml. This is in line with African studies [3,11,12,25] Total PSA is correlated with the risk of metastasis, particularly above 20 ng/ml [26]. The PSA range was 2 and 22,000 ng/ml. This result is similar to the study conducted in Senegal by Ndoeye et al., which found a mean PSA level ranging from 5.88 ng/ml to 21,660 ng/ml [16]. Prostate cancer in sub-Saharan Africa is consistent with advanced

prostate cancer.

The mean haemoglobin level was 9.85 ± 2.83 g/dl with extremes between 3.33 and 16.80 g/dl. The most common haemoglobin range was 8 to 11.9 mg/dl, although 76.8% of patients had a haemoglobin level of less than 12 mg/dl. This finding may explain why asthenia is the second most common clinical presentation for the diagnosis of prostate cancer. The median creatinine level was 14.40 mmol/l, with an interquartile range between 11.76 and 33.75 mmol/l and extremes between 3.55 and 238 mmol/l. There were 59 patients with elevated creatinine levels, 50.4% of them. This finding could be the subject of work on the risk factors for death in patients with prostate cancer. Urine microscopy and culture was performed in 117 patients and was abnormal in 96.6%. The germ most frequently found was *Escherichia coli* (70.7%), followed by *Klebsiella p* (14.7%). This finding is consistent with significant bladder outlet obstruction and a cause of hospital admission in relation to End Stage Renal Disease (ESRD). The most used sampling technique in our series was digitally guided biopsies (67.7%). This rate is like that of Diakité et al., who found a rate of 71.6% [27]. For Halidou et al., biopsy was the most representative type of sample (83.78%). This demonstrates the difficulties we face in sub-Saharan Africa [3]. This may be due to difficulties with the technical platform, the cost of the procedure or the long-standing practice of biopsy without ultrasound and possibly the data from the digital rectal examination [28].

Ultrasound is not specific and is not sensitive for the detection of prostate cancer. It has no place in the detection or disease extension assessment [29]. It is used for post-micturition assessment, prostate volume assessment and to guide biopsies [29]. Ureterohydronephrosis was found in 58 patients (44.6%). Post-void residual was found in 103 patients. Patients with a post-micturition residue of more than 100ml were the most numerous (39.8%). These results should draw our attention to the presence of a significant post-void residual in patients with advanced prostate cancer.

The most frequently performed morphological examinations were thoraco-abdomino-pelvic CT (TAP scan) in 123 patients (94.6%), followed by prostate MRI in 29 patients (22.3%). PET (Positron Emission Tomography) scan is not available in our country. All patients who underwent prostate MRI had a TAP CT scan (thoracic-abdominal-pelvic scanner) as assessment for metastasis after confirmation of the prostate cancer diagnosis. In the case of locally advanced disease or lymph node or bone metastases, TAP CT scan remains useful for detecting visceral metastases [30]. Kouka et al. found that CT scan was the most frequently performed examination after ultrasound [12]. Multiparametric MRI makes it

possible to measure prostate volume, to describe each suspicious area (or target) identified and analysed using the available version of the Prostate Imaging Reporting and Data System (PI-RADS) and for locoregional extension assessment [31]. MRI was not performed in the Kouka study because of a lack of technical facilities in Thiès [12]. In the case of advanced disease or lymph node or bone metastases, TAP CT scan remains useful.

In our series, 56.5% of patients presented with an International Society of Urological Pathology (ISUP) 3 Gleason score 7 (4+3). This result is like that of Mbamba et al., who found 51.5% of ISUP 3 (4+3) patients [11]. African studies, such as those by Halidou and Ondziel, show that the vast majority of patients have ISUP grade 4 (43.24%), ISUP grade 5 (37.29%) and between 7 and 8 [3,24]. Jalloh et al. found that the distribution of aggressive prostate cancer in the Gleason 4-5 group was similar between West Africa (39.9%) and South Africa (38.1%) [30]. In our series, the rate was 29.3%. Studies such as those by Kamadjou et al., on the other hand, reveal less aggressive cancers, with the majority having an ISUP score of 1. This may be explained by the fact that Kamadjou et al. had no metastatic stage [19].

The histological type was adenocarcinoma. This finding is consistent with the African literature [3,12,13,19,24,27,31,32]. Metastatic cancer at the time of diagnosis (synchronous cancer) was found in 92.3% of our patients. This result is higher than that of Halidou et al. (71.37%) and close to that of Sine et al. (83.3%) [3,25]. This difference can be explained by the difference in the number of patients. B Sine worked on patients with a Gleason score greater than or equal to 8 [25]. Our results, compared with the literature, show that prostate cancers are discovered at the metastatic stage (synchronous cancer).

We found bone metastases in 74.2% of cases and pulmonary metastases in 21.6%. This result is similar to that of Halidou et al. (77.35%) [3]. The African literature is in favor of a predominance of bone metastases [15,24,31,33].

In our series, 90.8% of patients had metastatic PCa. This result is characteristic of the late diagnosis of the patients and of the fact that the patients presented a synchronous cancer. This result is like that of Nzamba et al. [10] who found 95% of patients with locally advanced or metastatic prostate cancer, but differs from that of Rigaud et al., in France, who found 8.7% of patients in his population at stage T3-T4 and 65.3% at stage T1-T2 [17]. These results show that prostate cancer is diagnosed at an advanced stage in Africa and Cameroon in particular, unlike in European countries such as France. This suggests the need for a screening protocol for early diagnosis of prostate cancer adapted to our context.

The therapeutic strategy is to improve patient

comfort and increase life expectancy. The methods used are: Prostatectomy, external radiotherapy, hormone therapy and chemotherapy. The choice of each method depends on the patient's age, general condition, the stage of the cancer at the time of discovery and how far it has progressed.

The most common therapeutic measures are surgical castration (orchidectomy), radical prostatectomy and hormone therapy. All patients in the metastatic stage were on complete androgen blockade (93.2% of patients who had undergone orchiectomy and were anti-androgenic and 6.8% of patients on LHRH analogues and anti-androgens). These data are not consistent with those of Nzamba et al., in Côte d'Ivoire, who found hormone therapy and antiandrogens to be the most effective treatments. Surgical castration combined with antiandrogens (12%) [10]. This result shows that treatments vary from one country to base on several parameters like the socio economic context, however a study carried out by Biongolo et al. found that surgical castration improved general condition and symptomatology. It is a preferred option in our socio-economic context. [33]. This should prompt us to draw up guidelines specific to our own situation.

The limitation of this study lies in its monocentric nature because the sample size is not large

Conclusion

In our context, prostate cancer is a synchronous cancer. It is essential to adopt health measures that contribute to the early diagnosis of prostate cancer, such as screening and awareness campaigns.

Acknowledgment: The authors would like to thank the parents for giving their permission for the publication of this paper, which will help science in the future.

Authorship Contributions: Fouda Jean Cédrick and Mendouga Menye Coralie was involved in patient recruitment and wrote the article, Fouda Jean Cédrick and Mekeme Mekeme Junior Barthelemy were among those who looked after the patients, Mekeme Mekeme Junior Barthelemy has reviewed the article, Essama Joseph Parfait was involved in patient recruitment and took part in writing this article, Nwatsok Francis, Nseme Ambroise have reviewed the article, Bang Guy Aristide and Angwafo III Fru supervised the work

All authors contributed to the final correction

Disclosure of Conflicts of Interest: The authors declare no conflict of interest.

Références

1. Jalloh, M., Thiaw, G., Bathily, E.H.A.L., et al. Corrélation entre score de Gleason biopsique et métastases osseuses à la scintigraphie dans le cancer de la prostate. *Revue Uro Andro*. 2018. 1 : 501-8.
2. Troh E, N'Dah KJ, Doukouré B, Kouamé B, Koffi KE, Aman NA, et al. Cancers de la prostate en Côte-d'Ivoire: aspects épidémiologiques, cliniques et anatomopathologiques. *J. Afr. Cancer/African Journal of Cancer*. 2014. 6(4) : 202-8.

3. Halidou M, Kodo A, Diongolé H, Zakou ARH, Magagi I, Amadou S. Le Cancer de la Prostate au Niger: Aspects Épidémiologiques Cliniques et Histologiques à l'Hôpital National de Zinder. *Health Sci and Dis.* 2022. 23(6) : 113-6
4. Kimura, T., & Egawa, S. Epidemiology of prostate cancer in Asian countries. *Inter J Urol*, 2018. 25(6), 524-31.
5. Schafer, E. J., Laversanne, M., Sung, H., Soerjomataram, I., Briganti, A., Dahut, W., ... & Jemal, A. Recent patterns and trends in global prostate cancer incidence and mortality: an update. *Eur Urol.* 2025. 87(3), 302-313.
6. Giona, S. The epidemiology of prostate cancer. Exon Publications. 2021. 1-15.
7. Mbakop A, Essama Oyono JL, Ngbangalm C, Abondo A. Epidémiologie actuelle des cancers au Cameroun. *Bull Cancer.* 1992. (79) : 1101-4
8. Sow M, Nkegoum B, Essame Oyono JL, & Nzokou A. Aspects épidémiologiques et histopathologiques des tumeurs urogénitales au Cameroun. *Prog urol (Paris).* 2006,16(1): 36-9.
9. Angwafo FF, Yomi J, Mbakop A. Is cancer of the prostate rare in tropical (black) Africa? Case series from the Centre Hospitalier et Universitaire and the Hospital General de Yaounde from 1986 to 1990. *Bull Cancer Radiother.* 1994. 81(2):155-9. PMID: 7702897.
10. Nzamba Bisselou PL, Diallo S, Odo BA, Nziengui TC, Kouassi Kouamé KY, Kagambega Zoewendbem AG, & Toure M. Cancer de la prostate chez le sujet de race noire en Côte d'Ivoire. *Rev. int. sci. méd.(Abidj.).* 2021: 49-54.
11. Mbamba, O. F. M., Amougou, B., Kassougué, A., Diallo, S., Coulibaly, M. T., Diarra, A., ... & Diakité, M. L. Cancer Métastatique de la Prostate Hormono Naïf: Aspects Cliniques et Thérapeutiques au CHU Point G. *Health Sci and Dis.* 2023. 24(5) : 42-45
12. Kouka S, Bentefouet L, Jalloh M, Thiam N, Faye M, Diop M, Cisse M, Diame A, Diallo Y and Sylla C. Prostate Cancer in the Thies Region, Senegal: Epidemiological, Diagnostic and Therapeutic Aspects. *Open Journal of Urology.* 2024. 14, 71-82. doi: 10.4236/oju.2024.142008.
13. Gueye SJM, Labou I, Niang L, Kane R, Ndoye M. Profil clinique du cancer de la prostate au Sénégal. *Afr J Urol.* 2004. 10(3): p. 203-7
14. Terrier M, Terrier JE, Paparel P, Morel-Journel N, Baldini A et Ruffion A. Epidémiologie, diagnostic et pronostic du cancer de la prostate. *Médecine Nucléaire.* 2017. 41(5), 329-34.
15. Tengue K, Kpatcha TM, Botcho G, Leloua E, Amavi AK, Sikpa K et al. Profil épidémiologique, diagnostique, thérapeutique et évolutif du cancer de la prostate au Togo. *Afr J Urol.* 2016. 22(2), 76-82.
16. Ndoye M, Niang L, Gandaho KI, Jalloh M, Labou I et Gueye S. Cancer avancé de la prostate au Sénégal. Aspects diagnostiques à l'hôpital de Grand Yoff. *Prog Urol.* 2014, 24(5), 271-5.
17. Rigaud J, Le Normand L, Karam G, GLEMAIN P, Buzelin JM et Bouchot O. Facteurs pronostiques du cancer de la prostate traité par hormonothérapie de première intention. *Prog Urol.* 2002. 12, 232-9.
18. Jalloh M, Cassell A, Niang L et Rebbeck T. Global viewpoints: updates on prostate cancer in Sub-Saharan Africa. *BJU international.* 2024. 133(1), 6-13.
19. Kamadjou C, Wadeu AK, Kuitche J, Mbassi A, Kamga J et Angwafo, F. Prostate Cancer: Risk Factors and Outcome Indicators. *Surg Sci.* 2022. 13(8), 381-400.
20. Ahmed, A. E., Martin, C. B., Dahman, B., Chesnut, G. T., & Kern, S. Q. General Obesity and Prostate Cancer in Relation to Abdominal Obesity and Ethnic Groups: A US Population-Based Cross-Sectional Study. *Res Rep Urol.* 2024. 16, 235–44. <https://doi.org/10.2147/RRU.S48991>
21. Laukkanen JA, Laaksonen DE, Niskanen L, Pukkala E, Hakkarainen A, Salonen JT. Metabolic syndrome and the risk of prostate cancer in Finnish men: a population-based study. *Cancer Epidemiol. Biomarkers Prev.* 2004. 13:1646–50.
22. Bergengren O, Pekala KR, Matsoukas K, Fainberg J, Mungovan SF, Bratt O et Carlsson SV. Update on prostate cancer epidemiology and risk factors—a systematic review. *Eur Urol.* 2023. 84(2), 191-206.
23. Ling S, Brown K, Miksza JK, Howells LM, Morrison A, Issa E et Zaccardi F. Risk of cancer incidence and mortality associated with diabetes: A systematic review with trend analysis of 203 cohorts. *Nutrition, Metabolism and Cardiovascular Diseases.* 2021. 31(1), 14-22
24. Ondziel O AS, Banga Mouss RB, Ondongo A AM, Dimi N YI, Odzébé AWS, Bouya PA. Le Cancer de la Prostate chez les Sujets de Plus de 75 ans à Brazzaville. *Health Sci. Dis.* 2021. 22 ; 33-
25. Sine B, Sine NA, Thiam A, Sarr A, Zakou AR, Faye ST et Ba M. Cancers de la prostate de score de Gleason supérieur ou égal à 8: Evaluation de la survie des patients. *Afr J Urol.* 2016. 22(4), 243-248.
26. Salomon L, Bastide C, Beuzebec P, Cormier L, Fromont G, Hennequin C et al. Recommandations 2013 du CCAFU: Cancer de la prostate. *Prog Urol.* 2013. 23, S69-S101. [https://doi.org/10.1016/S1166-7087\(13\)70048-4](https://doi.org/10.1016/S1166-7087(13)70048-4)
27. Diakité M, Kasougué A, & Coulibaly B. Taux de PSA et pathologies prostatiques: une Analyse Histopathologique de 250 pièces. *The Journal of Medicine and Health Sciences.* 2019. 20(5),23-26.
28. Mbassi AA, Magni ET, Douanla DE, Kamga J, Mekeme J, Jiatsa NLR, Ngo Nonga B, Sando Z, Angwafo F et al. Étude comparative des biopsies de la prostate guidées par les doigts et par l'écho dans le diagnostic du cancer de la prostate à l'hôpital central de Yaoundé et au Centre médical la Cathédrale-Cameroun. *Journal of Cancer Research and Clinical Oncology.* 2017. 1, 2-6. <https://www.springer.com/>
29. Rozet F, Mongiat P, Hennequin C et al. Lignes directrices françaises du CCAFU — Mise à jour 2020-2022: Cancer de la prostate. *Prog Urol.* 2020. 30, 136-251. [https://doi.org/10.1016/S1166-7087\(20\)30752-1](https://doi.org/10.1016/S1166-7087(20)30752-1).
30. Jalloh Mohamed et al. "MP67-18 clinical characteristics of prostate cancer patients in west and South Africa in the Men of African Descent and Carcinoma of the Prostate (MADCaP) consortium study." *J Urol* 206.Supplement 3:2021: e516-e517.
31. Fofana A, Kouame B, Gowe EE, Kramo NAF, Konan KPG, Moro AC, et al. Cancer métastaté de la prostate: Aspects socio-économiques, radiologiques et évolutifs en Côte-d'Ivoire. *Afr J Urol.* 2017. 23 (4): 281-285.
32. Niang L, Ndoye M, Ouattara A, Jalloh M, Labou M, Thiam I et al. Cancer de la prostate: quelle prise en charge au Senegal? *Prog Urol.* 2013. 23 ,1: 36-41.
33. Biongolo F, Bombah F, de Paul Mama V, Mebara Z, Nonga BN. La castration chirurgicale dans la prise en charge des cancers métastatiques de la prostate à Yaoundé. *Health Sci and Dis.* 2020. 21(7) : 63-7



Aspects cliniques, thérapeutiques et évolutifs de l'infertilité du couple : étude quantitative dans une zone semi-urbaine du Cameroun

Clinical, therapeutic and evolutionary aspects of infertility in couples: a quantitative study in a semi-urban area of Cameroon

Alima JM,^{1,2} Wadje Moghom KT,³ Kamdem Modjo DE¹, Fouogue Tsuala J^{1,2} Ngo Dingom M,¹ Kenfack B,¹ Ossondo Nlom M,³ Ikei S,² Kemfang Ngowa JD⁴

Article Original

1. Faculté de Médecine et des Sciences pharmaceutiques de l'Université de Dschang, Cameroun
2. Hôpital Régional de Bafoussam, Cameroun
3. Institut Supérieur des Sciences de la Santé de l'Université des Montagnes, Cameroun
4. Faculté de Médecine et des Sciences Biomédicales de l'Université de Yaoundé I, Cameroun

Auteur Correspondant : Alima Jean Marie, Faculté de Médecine et des Sciences pharmaceutiques de l'Université de Dschang, Cameroun, Tel : +237696955127; E-mail : jeanmariealima9@gmail.com

Mots-clés : Infertilité du couple, zone semi-urbaine, Cameroun.

Keywords: Couple infertility, semi-urban areas, Cameroon.

Date de soumission: 15/01/2025
Date d'acceptation: 27/11/2025

RESUME

Introduction : L'objectif était de déterminer les aspects cliniques, thérapeutiques et évolutifs de l'infertilité du couple à l'Hôpital Régional de Bafoussam.

Matériel et Méthode : Il s'agissait d'une étude hospitalière transversale descriptive avec collecte rétrospective et prospective des données sur une période de 6 mois. La population d'étude était des couples reçus en consultation, chez lesquels le diagnostic d'infertilité avait été posé et dont l'âge de la femme variait de 18 à 49 ans.

Résultats : Nous avons enregistré 572 femmes vivant en couple venus en consultation pour infertilité et 189 couples ont été inclus. La fréquence des consultations pour infertilité était de 20,05%(572/2851). L'âge moyen des femmes était de 30,33 ± 5,97 ans et 37,32 ± 8,21 ans chez les hommes. La durée moyenne de l'infertilité était de 4,14 ± 3,94 ans. Les étiologies tubaires étaient les plus fréquentes chez les femmes (44,5%) tandis que les hommes avaient des anomalies du sperme (25,9%). Le traitement le plus utilisé comprenait le traitement anti-infectieux chez les femmes (52,9%) et les hommes (61,9%), les inducteurs de l'ovulation (11,6%) chez les femmes et la vitaminothérapie (11,1%) pour les hommes. Le traitement endoscopique représentait 7,9% des femmes ayant reçu un traitement chirurgical (11,1%). Seuls 18,5 % (28/151) des couples traités ont pu concevoir.

Conclusion : L'infertilité du couple concerne 1/5e des couples, correspondant à 2 fois la prévalence mondiale en zone semi-urbaine au Cameroun. Les causes sont essentiellement secondaires.

ABSTRACT

Introduction: The objective was to determine the clinical, therapeutic and evolutionary aspects of infertility in couples at the Bafoussam Regional Hospital.

Materials and Methods: This was a descriptive cross-sectional hospital study with retrospective and prospective data collection over a period of six months. The study population consisted of couples who had been seen in consultation, had been diagnosed with infertility, and whose female partners were aged between 18 and 49.

Results: We registered 572 women living with a partner who came for infertility consultations and 189 couples were included. The frequency of consultations for infertility was 20.05% (572/2851). The mean age of the women was 30.33 ± 5.97 years and 37.32 ± 8.21 years for the men. The mean duration of infertility was 4.14 ± 3.94 years. Tubal causes were the most common in women (44.5%), while men mainly had sperm abnormalities (25.9%). The most common medical treatments included anti-infectious treatments in women (52.9%) and men (61.9%), ovulation inducers (11.6%) in women and vitamin therapy (11.1%) in men. Endoscopic treatment accounted for 7.9% of women who received surgical treatment (11.1%). Only 18.5% (28/151) of the couples treated were able to conceive.

Conclusion: Infertility affects one-fifth of couples. The causes are mainly secondary. More than half receive anti-infectious treatment. Nearly one in five couples were able to achieve pregnancy.

DOI : <https://doi.org/10.64294/jsd.v3i4.186>

Introduction

L'infertilité du couple est l'incapacité à obtenir une grossesse clinique après 12 mois ou plus pour un couple ayant des rapports sexuels non protégés et réguliers et sans l'utilisation de méthodes contraceptives [1,2,3]. L'infertilité est considérée comme un problème majeur de Santé Publique ; car celle-ci toucherait environ 48 millions de couples et 186 millions de personnes dans le monde [1]. La prévalence mondiale de l'infertilité du couple est estimée entre 8 et 12%. L'Afrique sub-saharienne, l'Asie du Sud, du Centre et l'Europe de l'Est comptent le plus grand nombre de cas d'infertilité du couple [4, 5]. En Afrique, la fréquence varie selon les pays : 16,2% au Mali [6], 11% en République démocratique du Congo [7] et 19,2% au Cameroun [8].

En Afrique, plusieurs études ont montré que l'infertilité secondaire est la plus rencontrée. Selon Sule et al. sa fréquence est de 77,5% contre 22,5% pour l'infertilité primaire [9]. Odunvbun et al. ont également retrouvé des résultats similaires, avec une proportion de 76,8% pour l'infertilité secondaire et 23,2% pour l'infertilité primaire [10]. Chez la femme, les troubles de l'ovulation, l'obstruction tubaire, l'endométriase, les fibromes utérins sont des étiologies fréquentes [11, 12]. Chez l'homme, les anomalies du sperme représentent environ 90 % des causes d'infertilité. Les autres étiologies étant les troubles sexuels [12,13]. Les explorations en matière d'infertilité nécessitent un panel d'examens biologiques, d'imagerie et d'endoscopie [11,12,13]. Depuis des décennies, outre les traitements médicamenteux usuels et chirurgicaux, plusieurs méthodes d'assistance médicale à la procréation ont vu le jour et ont pu changer le pronostic de cette pathologie.

En Afrique, y compris au Cameroun, l'objectif principal d'un couple est celui de procréer [14]. L'enfant est considéré comme une source de richesse, une valeur sociale, une bénédiction pour le couple. Cette incapacité à procréer est à l'origine de tristesse, d'une diminution de l'estime de soi, de stress, d'anxiété et de discords conjugaux chez ces couples [15,16]. Le but de notre étude était de déterminer les facteurs cliniques, thérapeutiques et évolutifs de l'infertilité du couple à l'Hôpital Régional de Bafoussam (HRB) afin de pouvoir améliorer la prise en charge dans notre contexte.

Matériel et Méthode

Il s'agissait d'une étude transversale descriptive avec collecte rétrospective et prospective des données. Le volet prospectif a duré 6 mois, du 1er janvier au 30 juin 2023. Le volet rétrospectif quant à lui s'est fait sur une période de cinq années, du 1er janvier 2018 au 31 décembre 2022. Le recrutement des patients et des dossiers médicaux a été fait à l'HRB, situé dans la capitale de la région de l'Ouest Cameroun en zone semi-urbaine. C'est un Hôpital de troisième catégorie

sur la pyramide sanitaire du Cameroun et doté de services suivants : médecine interne, chirurgie, pédiatrie, odontostomatologie, kinésithérapie, urgences, gynécologie-obstétrique, laboratoires d'analyses biologiques et anatomopathologie. Il s'est doté d'une colonne d'endoscopie depuis 2018, ce qui a permis la réalisation des toutes premières chirurgies endoscopiques pour infertilité dans une structure sanitaire publique de la région de l'Ouest. Le service de gynécologie-Obstétrique enregistre en moyenne huit-cents consultations annuelles, et des chirurgies endoscopiques pour infertilité y sont réalisées. La population cible était des patients venus consulter au service de gynécologie-obstétrique de l'HRB durant notre période d'étude. La taille minimale de l'échantillon a été calculée grâce à la formule de Cochran ($N = \frac{z^2 \cdot p \cdot d}{e^2}$: N = taille minimale de l'échantillon, z est la valeur de z pour IC de 95 %, d est la marge d'erreur à 5%, p la prévalence de l'infertilité). D'après l'OMS, la prévalence de l'infertilité mondiale est estimée entre 8-12% pour une moyenne de 10% [1]. L'application numérique de cette formule nous a donné une taille minimale d'échantillon de 139 couples. La pondération de la marge de sécurité pour non répondants et dossiers incomplets est de 153 couples.

Ont été inclus, les couples reçus en consultation chez lesquels le diagnostic d'infertilité avait été posé et dont l'âge de la femme était de 18 à 49 ans. Les dossiers des couples pour lesquels le diagnostic d'infertilité avait été posé dans la même tranche d'âge. Par contre ont été exclus de notre étude les couples n'ayant pas consenti à participer et tous les dossiers introuvables et inexploitable. L'échantillonnage a été fait de manière non probabiliste, consécutive. Les variables d'intérêt étaient : les données sociodémographiques (âge, sexe, profession, statut matrimonial, région d'origine) ; les données thérapeutiques (traitement médical : antibiothérapie, inducteurs d'ovulation, antiprolactinémiques, substituts d'hormones, vitaminothérapie, le traitement chirurgical à type de myomectomie, plastie tubaire, chirurgie exérèse) ; les techniques de procréation médicalement assistée (indications et taux de réalisation), les données évolutives (taux de grossesses obtenue ; délai de conception (en mois) ; et le devenir de la grossesse. Les données collectées ont été saisies, grâce au logiciel Excel et l'analyse a été faite grâce au logiciel SPSS 20 (Statistical Package For the Social Sciences). Les variables quantitatives ont été résumées sous forme de moyenne $\pm$ écart type ou médiane et intervalle interquartile après vérification de la distribution par le test de normalité (kolmogorov-smirnov). Les variables qualitatives ont été exprimées sous formes d'effectifs et de fréquences. Les autorisations du comité éthique de l'HRB (N°55/L/ MINSANTE/SG/DRSPO/HRB/D du 11/01/2023) et du comité institutionnel d'éthique de l'Université des

montagnes de Bagangté (Autorisation N° :2023/038/UDA/PR/CEAQ du 24/04/2023) ont été obtenues. La collecte de données s'est faite comme suit :

Pour la phase rétrospective, nous consultions les registres de consultations externes ainsi que les dossiers médicaux des patients. Chez les patients remplissant nos critères d'inclusion, nous avons recueilli les variables utiles à notre travail sur la fiche d'enquête préétablie.

En phase prospective, nous avons abordé les femmes, hommes en union et les couples venus consulter pour désir de conception. Après présentation de l'étude, nous avons obtenu leur consentement éclairé écrit et les variables utiles pour notre étude étaient recueillies après la consultation. Les patients étaient revus ultérieurement pour présentation de résultats d'examens et prescription de traitement. Elles étaient par la suite lors de leur suivi. Le suivi était réalisé par des appels téléphoniques pour compléter les informations manquantes telles que la survenue de la grossesse.

Résultats

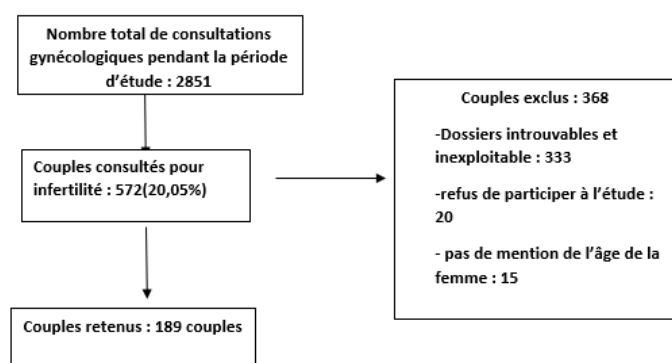


Figure 1 : diagramme de flux de notre recrutement

Au total, 572 couples étaient venus consulter pour infertilité, 368 parmi ces couples ont été exclus pour dossiers inexploitable (333 cas), refus de participer à l'étude (20 cas), absence de mentions d'âge de la femme (15 cas). Et 189 couples ont été inclus. La fréquence des consultations pour infertilité à l'HRB était de 20,05%(572/2851). La tranche d'âge la plus représentée dans la population féminine était la tranche de [30-35[ans avec une fréquence de 29,1 % (55/189). La moyenne d'âge était de $30,33 \pm 5,97$ ans et des extrêmes allant de 18 à 43 ans. Près d'un tiers des femmes exerçaient un métier du secteur informel (30,2%) et 61,4 % (116/189) vivaient maritalement. Chez les hommes la moyenne d'âge était de $37,32 \pm 8,21$ ans avec un minimum de 23 et un maximum de 70 ans. Au total, la majeure partie des hommes, soit 61,4% (116/189) était mariée et exerçait un métier du secteur informel (45% ; 53/189) (tableau I).

L'infertilité secondaire était la plus fréquente chez les femmes et les hommes pris séparément ainsi que les couples avec des fréquences respectives de 66,7%, 69,8% et 55,6%. La majeure partie des infertilités

se situait entre 1-5 ans comme le montre le tableau II avec une durée moyenne de l'infertilité de $4,14 \pm 3,94$ ans. Les extrêmes étaient d'un et de 24 ans ; ce qui correspond à un intervalle interquartile de (1,5-5). Quarante-quatre virgule cinq pour cent des femmes présentaient une infertilité d'origine tubaire. Chez les hommes, les anomalies du sperme étaient les étiologies les plus retrouvées dans 26 % des cas (Figure 3 et 4). Seuls 18,5 % (28/151) des couples traités avaient pu concevoir.

Tableau I : profil sociodémographique des couples infertile (N=189)

Variables	Femme		Homme	
	Effectifs (N=189)	Fréquence (%)	Effectifs (N=189)	Fréquence (%)
Age(en année)				
[18-20[	5	2,5	0	0
[20-25[	33	17,5	3	1,6
[25-30[	50	26,5	25	13,2
[30-35[	55	29,1	43	22,8
[35-40[	30	15,9	54	28,6
[40-50[	16	8,5	33	17,4
≥50	0	0	31	16,4
Statut Matrimonial				
Marié(e)	116	61,4	116	61,4
Union libre	63	33,3	63	33,3
Non spécifié	10	5,3	10	5,3
Profession				
Secteur formel	54	28,6	53	28
Secteur informel	57	30,2	85	45
Ménagère	42	22,2	0	0
Elève/ étudiant	22	11,6	1	0,5
Sans emploi	0	0	3	24,9
Non spécifié	14	7,4	47	1,6

Tableau II : répartition des couples infertiles selon le type d'infertilité (N= 189)

Variables	Couple		Femmes		Hommes	
	Effectifs (N=189)	Fréquence (%)	Effectifs (N=95)	Fréquence (%)	Effectifs (N=95)	Fréquence (%)
Infertilité primaire	78	41,2	26	27,4	26	27,4
Infertilité secondaire	105	55,6	63	66,3	66	69,5
Infertilité idiopathique	6	3,2	6	6,3	3	3,1

Le traitement anti-infectieux était celui le plus prescrit dans la population féminine avec une fréquence de 52,9% des cas, suivi des inducteurs de l'ovulation dans 11,6% des cas. Le traitement chirurgical a été administré chez 11,1% de femmes, dont 7,9%

d'endoscopie et 3,2% par laparotomie.

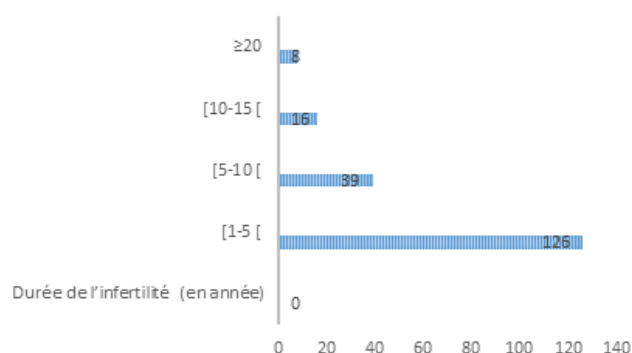


Figure 2 : durée de l'infertilité (N= 189)

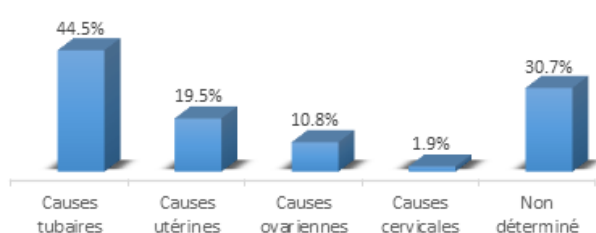


Figure 3 : étiologies de l'infertilité chez les femmes (N= 189)

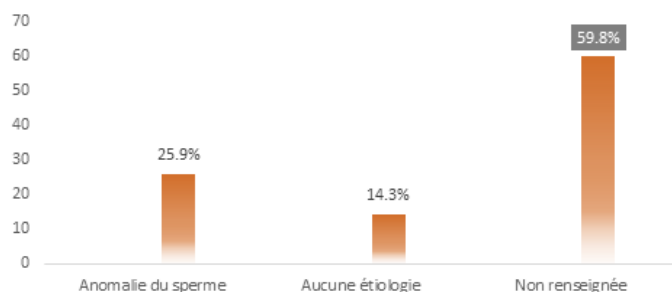


Figure 4 : population masculine en fonction des étiologies (N= 189)

Seulement trois femmes qui avaient eu une recommandation de procédure de procréation médicalement assistée (PMA), l'avaient effectivement réalisé dans des centres spécialisés soit une fréquence de 1,6% (tableau V). Le traitement anti-infectieux était le traitement le plus administré chez les hommes (61,9%) (Figure 5).

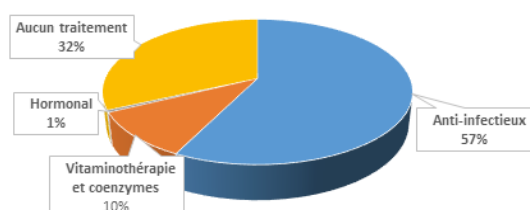


Figure 5: répartition de la population masculine en fonction des traitements (N=189)

De ces grossesses, 89,3% ont eu un déroulement normal, tandis que 7,1%(2/28) se sont soldées par des avortements spontanés. La majorité des couples ont pu concevoir après un délai moyen supérieur à 6 mois (tableau IV).

Tableau III : traitements reçus par les femmes (N=189)

Variables	Effectifs (N=189)	Fréquence (%)
Médicamenteux		
Anti-infectieux	100	52,9
Hormonal	15	7,93
Inducteur de l'ovulation	22	11,6
Antiprolactinique	3	1,6
Hormonal substitutif thyroïdien	1	0,5
Metformine	2	1,1
Chirurgical		
Myomectomie	3	1,6
Plastie tubaire par cœlioscopie	7	3,7
Adhésiolyse par cœlioscopie	8	4,2
Ablation d'endométriose	3	1,6
Techniques d'assistance médicale à la procréation		
Fécondation in vitro	1	0,5
ICSI®	2	1,1
Aucun traitement administré	38	20,1

® ICSI : Injection intra-cytoplasmique de spermatozoïde

Tableau IV : grossesses obtenues et leur devenir parmi les couples traités (N=189)

Variables	Effectifs (N=151)	Fréquence (%)
Grossesse		
Oui	28	18,5
Non	55	36,4
Non déterminé	68	51
Devenir de la grossesse (N=28)		
Normal	25	89,3
Fausse couche spontanée	2	7,1
En cours	1	3,6
Délai de conception		
< 3 mois	9	30,0
3 - 6mois	5	16,7
>6 mois	16	53,3

Discussion

L'infertilité du couple est une situation fréquente dans notre milieu, telle que l'atteste la fréquence de 20,05%(572/2851) retrouvée au cours de nos consultations. L'infertilité secondaire était de 55,6% avec une durée moyenne de $4,14 \pm 3,94$ ans. Les étiologies tubaires étaient les plus fréquentes chez les femmes tandis que les hommes avaient majoritairement les anomalies du sperme. Les traitements anti-infectieux étaient les plus prescrits chez les femmes et les hommes à 52,9% et 61,9%

respectivement, secondairement suivie, des inducteurs de l'ovulation (11,6%) chez les femmes et de vitaminothérapie (11,1%) pour les hommes. Seuls 28/151(18,5 %) des couples traités ont pu concevoir, parmi ces grossesses, 89,3% ont eu un décours normal. La fréquence des consultations pour infertilité du couple était proche de celle de Koné et al. [6] et similaire à celle d'Egbe et al. [8], malgré le fait que notre étude ait été réalisée dans un milieu semi-urbain. La raison en serait que notre population est dans un même bassin démographique et a les mêmes mœurs que celle de Egbe et al.

L'âge moyen des femmes était de $30,33 \pm 5,97$ ans. Ce résultat est identique à ceux de Koné et al. et Egbe et al. qui étaient de $30,16 \pm 0,357$ et $30,1 \pm 5,7$ respectivement. La moyenne d'âge des hommes était de $37,32 \pm 8,21$ ans, résultat similaire à ceux trouvés par Egbe et al. [8] et Halidou et al [17]. En ce qui concerne le statut matrimonial, 60,3% de la population étaient constituée de personnes mariées. Ce résultat similaire à celui d'Egbe et al. mais inférieur à celui de Koné et al. (94%) [6]. La majeure partie (61,4 %) de nos participants étaient mariés. Et exerçaient un métier du secteur informel, 30,2% de femmes et 45% d'homme.

Les anti-infectieux étaient le traitement le plus administré tant chez les femmes (52,9%) que chez les hommes à 61,9% des cas. Ces résultats s'expliquent par une prévalence élevée des infections sexuellement transmissibles tel que trouvé par Kemfang et al. en 2003 [18]. Chez les patientes consultant pour infertilité à Yaoundé. En deuxième place, nous avons les inducteurs d'ovulation dans 11,6% des cas. Résultat inférieur à celui de Koné (Mali, 2024). Et les hommes avaient les vitaminothérapies et co-enzymes, comme démontré par plusieurs auteurs [19,20].

Les traitements chirurgicaux étaient retrouvés dans 11,1% des cas chez les femmes dont 7,9% de laparoscopie (les gestes étaient les adhésiolyses (4,2%) et les plasties tubaires (1,6%)), résultat inférieur à celui de Mboudou et al. (69,8%)[21] ainsi qu'à celui de Boudhraa et al. (70%) (Tunisie 2009) [22].

Les techniques de procréation médicalement assistée réalisées étaient l'ICSI chez deux participantes et la fécondation in vitro. Elles n'ont pas été pratiquées au sein notre formation sanitaire mais plutôt dans des structures hospitalières à Douala.

Vingt-huit grossesses (18,6%) avaient été obtenues après traitement : 26 après traitement médical (92,9 %), 01 après traitement chirurgical (3,6 %) et 01 par assistance médicale à la procréation (3,6 %). Ce taux de grossesse était supérieur à celui retrouvé par Dimassi et al. 8,3%[23] et inférieur aux résultats de Kasia et al. (28,5%)[24] et Koné et al. (30%)[6]. Cette différence entre nos résultats et ceux de Dimassi et al.

pourraient être due au fait que nous prenions toutes les étiologies en considération alors que Dimassi et al. n'avaient que les grossesses après traitement par plastie tubaire. Tandis que la différence entre nos résultats et ceux de Kasia et al. s'expliquerait par des causes mécaniques tubaires (obstruction tubaire, phimosis, endométriose, hydrosalpinx) non prises en charge, le traitement endoscopique ayant été jugé onéreux par les patientes. L'endoscopie étant pourtant reconnue comme le traitement de référence pour la prise en charge d'anomalies tubaires [24].

Dans Notre série, 89,3% de grossesse obtenues après traitement ont eu une évolution normale contre 7,1% (avortement spontané). Boudhraa et al. avait des résultats moins reluisants (37 ;1% de grossesse ayant évolué normalement et 2,8% de grossesse extra-utérine) [22]. Les limites de l'étude étaient le biais de sélection par le caractère rétrospectif de la collecte des données et le biais d'échantillonnage par le taux élevé des perdus de vue.

Conclusion

L'infertilité du couple concerne 1/5e des couples, correspondant à 2 fois la prévalence mondiale en zone semi-urbaine au Cameroun. Les causes sont essentiellement secondaires. Plus de la moitié des sujets reçoivent un traitement anti-infectieux. Près d'un couple sur cinq a pu obtenir une grossesse.

Remerciements : Nos remerciements vont aux patient(e)(s) qui librement ont accepté de participer à cette étude. Mais aussi au personnel de l'Hôpital régional qui nous a aidés à réaliser cette étude.

Contributions des auteurs :

Conception et acquisition des données : Alima J.M, Wadje Moghom K.T, Kemfang Ngowa J.D, Analyse et interprétation des données : Alima J.M, Wadje Moghom K.T, Kemfang Ngowe J.D, Ossondo Nlom M., Rédaction de l'article. Alima J.M, Ikie S., Révision critique du contenu intellectuel : Kemfang Ngowa J.D, Ngo Dingom M., Kamdem Modjo D.E, Fouogue Tsuala J., Kenfack B. Approbation finale du contenu à publier : Tous les auteurs ont lu et approuvé la version finale du manuscrit.

Aucun conflit d'intérêt signalé.

Appuis financiers et autres types de sponsoring : Cette étude a été entièrement financée sur fond propre des différents auteurs.

Le consentement éclairé des patient(e)(s) a été obtenu.

Références

1. World Health Organization. Infertility prevalence estimates, 1990–2021. World Health Organization, 2023. [Cité 25 févr 2025]. Disponible sur: <https://www.who.int/publications/item/978920068315.pdf>
2. Royfman R, Shah TA, Sindhwani P, Nadiminty N, & Avidor-Reiss T. (2020). Sterility, an overlooked health condition. Women, 1(1), 29-45.
3. Vander Borgh M, Wyns C. Fertility and infertility: Definition and epidemiology. Clin Biochem. 2018; 62:2-10.

4. Inhorn MC, Patrizio P. Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. *Hum Reprod Update*. 2015; 21(4):411-26.
5. Colpi GM, Francavilla S, Haidl G, Link K, Behre HM, Goulis DG, et al. European Academy of Andrology guideline Management of oligo-astheno-teratozoospermia. *Andrology*. 2018;6(4):513-24.
6. Koné A, Dao K, Drago AA, Diallo MB, M Mariko M, Coulibaly A, Sow DS. (2024). Aspects Épidémiocliniques et Étiologiques de l'Infertilité au Mali. *Health Sci Dis*, 25(5). <https://doi.org/10.5281/hsd.v25i5.5635>
7. Buambo GRJ, Potokoue-Mpia SNB, Mokoko J C, Ikobo-Okoko E, Bodzongo P, Aya Somboco ZM, Locko-Mafouta R, Itoua C. Exploration de la Femme Infertile à Brazzaville: Une Étude Descriptive Transversale. *Health Sci. Dis*: 26(8), August 2025 pp 72-75
8. Egbe TO, Mbaki CN, Tendongfor N, Temfack E, Belley-Priso E. Infertility and associated factors in three hospitals in Douala, Cameroon: a cross-sectional study. *Afr Health Sci*. 2020; 20(4):1985-95.
9. Sule JO, Erigbali P, Eruom L. Prevalence of Infertility in Women in a Southwestern Nigerian Community. *Afr J Biomed Research*. 2008; 11(2).
10. Odunvbun WO, Oziga DV, Oyeye LO, Ojeogwu CL. Pattern of infertility among infertile couple in a secondary health facility in Delta State, South Nigeria. *Trop J Obstet Gynecol*. 2018;35(3):244-8.
11. OMS, Organisation Mondiale de la Santé. Infertilité [Internet]. [Cité 25 févr 2025]. Disponible sur: <https://www.who.int/fr/news-room/fact-sheets/detail/infertility>
12. Segal TR, Giudice LC. Before the beginning: environmental exposures and reproductive and obstetrical outcomes. *Fertil Steril* 2019; 112(4):613-21.
13. Fouda JC, Mekeme MJB, Owon'Abessolo PF, Mbouche LO, Epoupa NFG, Nwaha MAS et al. Aspects paracliniques de l'infertilité masculine à l'Hôpital Central de Yaoundé. *Afric Uro* 2023; 3: 27a-27d <https://doi.org/10.36303/AUJ.0041>
14. Liamputtong P, Benza S. « Being able to bear a child »: Insights from Zimbabwean women in Melbourne. *Women Birth*. 2019; 32(2):e216-22.
15. Donkor ES, Naab F, Kussiwaah DY. « I am anxious and desperate »: psychological experiences of women with infertility in The Greater Accra Region, Ghana. *Fertil Res Pract*. 2017; 3:6.
16. Broekmans FJ, Kwee J, Hendriks DJ, Mol BW, Lambalk CB. A systematic review of tests predicting ovarian reserve and IVF outcome. *Hum Reprod Update*. 2006; 12(6):685-718.
17. Halidou M, Magagi IA, Zakou ARH, Kodo A, Adamou H, Amadou S. Infertilité Masculine à l'Hôpital National de Zinder : Aspects Épidémiologiques et Cliniques: Male infertility at the National Hospital of Zinder: Epidemiology and clinical features. *Health Sci Dis*; 23(3.)
18. Kemfang NJ, Mboudou E, Toukam M, Ngassam A, Kasia JM. Séroprévalence de l'infection à *Chlamydia trachomatis* chez les femmes consultant pour infertilité à l'hôpital général de Yaoundé. *Guinée Méd*. 2014; 17-21.
19. Salas-Huetos A, Bulló M, Salas-Salvadó J. Dietary patterns, foods and nutrients in male fertility parameters and fecundability: a systematic review of observational studies. *Hum Reprod Update* 2017; 23(4): 371-89.
20. Lameignère É, Mahbouli S, Dupont C, Levy R. Intérêt clinique d'une supplémentation alimentaire dans la prise en charge de l'homme infertile. *Méd Reprod* 2020; 22 (1): 28-39. Doi: 10.1684/mte.2020.0779
21. Mboudou, ET. Fomane, P. Lifang-Ikomi Morfaw, F. Ze Minkande, J. Sama Dohbit, B A. Enama Mbatsogo. Female infertility and laparoscopic surgery: A series of 415 operations at the Yaounde Gyneco-Obstetric and Pediatric Hospital, Cameroon. *Open J of Obstet Gynecol*, 2013, 3, 663-667 OJOG <http://dx.doi.org/10.4236/ojog.2013.39121> Published Online 2013 (<http://www.scirp.org/journal/ojog/>)
22. Boudhraa KMA, Jellouli O, Kassaoui N, Ben Aissia R, Ouerhani A, Triki M, Gara F. : intérêt de l'hystéroscopie et de la coéloscopie dans la prise en charge du couple infertile : à propos de 200 cas. *la tun med* - 2009 ; Vol 87 (n°01) : 55 - 60
23. Dimassi K, Gharsa A, Badis Chanoufi M, Sfar E, Chelli D. Résultats de la plastie tubaire: étude tunisienne. *Pan Afric Med J*. 2014; 18:58. [doi: 10.11604/pamj.2014.18.58.4128]
24. Kasia JM, Ngowa JDK, Mimboe YS, Toukam M, Ngassam A, Noa CC, et al. Laparoscopic Fimbrioplasty and Neosalpingostomy in Female Infertility: A Review of 402 Cases at the Gynecological Endoscopic Surgery and Human Reproductive Teaching Hospital in Yaoundé-Cameroon. *J Reprod Infertil*. 2016; 17(2):104-9



La torsion du cordon spermatique à l'Hôpital Central de Yaoundé

Torsion of the spermatic cord at the Yaounde Central Hospital

Fouda JC^{1,2}, Mekeme MJB^{1,2}, Mbassi AA^{1,3}, Owon'Abessolo PF⁴, Beling AYG¹, Epoupa NFG², Moby MH⁴, Bang GA², Angwafo III F²

Article Original

1. Hôpital Central de Yaoundé
2. Faculté de Médecine et des Sciences Biomédicales de l'Université de Yaoundé I
3. Institut Supérieur des Technologies Médicales
4. Faculté de Médecine et des Sciences Pharmaceutiques de l'Université de Douala

Auteur correspondant :

Fouda Jean Cédric, Faculté de Médecine et des Sciences Biomédicales de l'Université de Yaoundé I, BP 1364 Yaoundé,
Email : cedrickfouda@gmail.com,
Tel : (+237) 675160954

Mots clés : torsion du cordon spermatique, testicules, urgence, scrototomie, hôpital central de Yaoundé

Key words: torsion of the spermatic cord, testicles, emergency, scrototomy, Yaoundé central hospital.

Date de soumission: 29/10/2025

Date d'acceptation: 09/12/2025

RESUME

Introduction : La torsion du cordon spermatique (TCS) est une urgence chirurgicale dont le délai de prise en charge détermine le pronostic vital du testicule. C'est ainsi que nous nous sommes intéressés à étudier les aspects épidémiologique, clinique et thérapeutique de la torsion du cordon spermatique à l'Hôpital Central de Yaoundé.

Méthodologie : Nous avons mené une étude descriptive et rétrospective sur une période de 05 ans allant de 2020 à 2024 et une durée de 9 mois allant de Septembre 2023 à Mai 2024 dans le service d'Urologie et Andrologie et dans le service des Urgences Chirurgicales de l'Hôpital Central de Yaoundé.

Résultats : Nous avons colligé 48 patients. L'âge médian était de 23 ans avec des extrêmes entre 13 et 30 ans. Le délai de consultation médian était de 25 ans. Vingt-et-un patients (43,75%) consultaient avant la première heure. La douleur aiguë d'un hémiscrotum était le symptôme principal. La tuméfaction de l'hémiscrotum, la présence du signe du Gouverneur et l'absence de signe de Prehn étaient les signes physiques les plus dominants. Le délai médian de prise en charge chirurgicale était de 8 heures. La torsion intravaginale était la plus fréquente. L'orchidectomie a été réalisée chez 27 patients soit 56,25%.

Conclusion : La TCS est de diagnostic et prise en charge tardifs traduisant un taux élevé d'orchidectomie. Une amélioration du pronostic testiculaire passe par la sensibilisation du public et du personnel soignant.

ABSTRACT

Introduction: Spermatic cord torsion (SCT) is a surgical emergency whose delay in treatment determines the vital prognosis of the testicle. We therefore set out to study the epidemiological, clinical and therapeutic aspects of spermatic cord torsion at Yaoundé Central Hospital.

Methodology: We conducted a descriptive and retrospective study over a period of 05 years from 2020 to 2024 and a period of 09 months from September 2023 to May 2024 in the Urology and Andrology Department and the Surgical Emergency Department of the Yaoundé Central Hospital.

Results: We enrolled 48 patients. The median age was 23 years, ranging from 13 to 30 years. The median consultation time was 25 years. Twenty-one patients (43.75%) consulted before the first hour. Acute hemiscrotal pain was the main symptom. Swelling of the hemiscrotum, the presence of Gouverneur's sign and the absence of Prehn's sign were the most common physical signs. The median time to surgery was 8 hours. Intravaginal torsion was the most common. Orchiectomy was performed in 27 patients (56.25%).

Conclusion: SCT is diagnosed and managed late, resulting in a high rate of orchiectomy. To improve testicular prognosis, the public and healthcare staff need to be made more aware of the disease, diagnostic capabilities need to be strengthened and protocols for rapid management need to be put in place.

DOI : <https://doi.org/10.64294/jsd.v3i4.187>

Introduction

La torsion du cordon spermatique (TCS) est une urgence fonctionnelle qui met en jeu le pronostic vital du testicule [1]. Il s'agit d'une urgence chirurgicale dont le délai de prise en charge détermine la vitalité du testicule. En effet, Seizilles de Mazancourt trouvait, dans son étude, qu'un traitement conservateur a été réalisé dans 99 % des cas de torsion opérés dans les 6 h contre 95 % des cas opérés entre 6 et 12 h. Au-delà de 24 heures de douleurs, pour une torsion confirmée, le taux d'orchidectomie était de 54 % concluant ainsi que le temps limite de 6 heures semble pouvoir éviter une orchidectomie [2]. Elle peut survenir à tout âge y compris des patients de 80 ans [3] et elle met en jeu le pronostic fonctionnel du testicule et demande à tenir compte du fait que le sujet a une longue espérance de vie avec un besoin de fertilité. Il existe deux pics de fréquence que sont la première année de vie et la période pubertaire [1]. En France, au service d'urologie de l'Hôpital Pitié-Salpêtrière, l'incidence est estimée à un cas pour 4000 hommes âgés de moins de 25 ans [1]. En Afrique, il y a peu de données sur la TCS. Au Bénin, Avakoudjo et al. retrouvaient une fréquence de 17% des urgences andrologiques [4]. La TCS constitue 4,2% des urgences urologiques à l'HCY [6], 8,24% des urgences urologiques dans une étude bicentrique à Douala [6] et 11,33% des urgences andrologiques à Douala [7]. Fort de ce constat, nous avons trouvé opportun d'étudier les aspects épidémiologique, clinique et thérapeutique de la torsion du cordon spermatique à l'Hôpital Central de Yaoundé (HCY).

Méthodologie

Nous avons mené une étude descriptive et rétrospective sur une période de 05 ans allant de 2020 à 2024 et une durée de 09 mois allant de Septembre 2023 à Mai 2024 dans le service d'Urologie et Andrologie et dans le service des Urgences Chirurgicales de l'Hôpital Central de Yaoundé. Étaient inclus dans cette étude, tout dossier complet de patient pris en charge à l'HCY pour TCS. N'étaient pas inclus, tout dossier incomplet. La taille de l'échantillon a été obtenue avec la formule suivante : $n = t^2 \cdot p \cdot (1-p) / m^2$ avec n : Taille minimale de l'échantillon pour l'obtention des résultats significatifs, t : Niveau de confiance (la valeur type du niveau de confiance de 99% est 2,75), p : Proportion estimée de la population (celle utilisée est 1 cas pour 4000), m : Marge d'erreur (fixée à 1%).

Ce calcul nous a permis d'obtenir une taille de 16 patients. Le recueil des données s'est fait après obtention d'une clairance éthique. Les variables étudiées étaient les facteurs socio-démographiques, les formes anatomo-cliniques et la prise en charge de la TCS. Les formes anatomo-cliniques reposaient sur la recherche de symptômes et signes physiques en l'occurrence le signe de Gouverneur, le signe de Prehn. Pour ce qui est de la prise en chirurgicale,

après une anesthésie locale, me malade étant en décubitus dorsal, nous faisons en général une incision sur le raphé médian puis nous procédons à une extériorisation du testicule que nous réanimons en enveloppant le testicule pendant 15 à 30 minutes dans une compresse imbibée de sérum physiologique tiède s'il y a des signes de souffrance après détorsion ensuite nous procédons à l'orchidopexie en faisant une fixation latérale et médiale du testicule si le testicule n'est pas nécrosé avec orchidopexie controlatérale mais si le testicule est nécrosé (testicule noirâtre ou violacé sans récupération après réanimation), nous procédons à une orchidectomie et programmions une orchidopexie controlatérale en différé. Les paramètres suivants ont été étudiés : l'âge, le délai de consultation, le délai de prise en charge chirurgicale, l'existence d'épisodes similaires avec résolution Spontanée, l'aspect clinique, les lésions per opératoires du testicule concerné, le nombre de tours de spires, la voie d'abord chirurgicale, le geste chirurgical réalisé et le suivi après le traitement.



Figure 1 : Testicule droit ascensionné par rapport au testicule gauche



Figure 2 : Testicule et épididyme infarci



Figure 3 : absence de recoloration du testicule et de l'épididyme après détorsion et réanimation durant 30 minutes)



Figure 4 : image présentant un tour de spires et un infarctus du cordon spermatique en aval de la spire

Résultats

Il était recensé 90 dossiers de patients présentant une TCS. Les 42 dossiers non inclus étaient incomplets. Au total, 48 dossiers étaient retenus. L'âge médian des patients étaient de 23 ans [18-27] avec des extrêmes entre 13 et 30 ans. La tranche d'âge la plus représentée est celle de 21 à 25 ans avec 18 patients soit 37,5% suivi de celle de plus de 25 ans avec 15 patients soit 31,25% et 16 à 20 ans avec 9 patients soit 18,75% (Figure 5).

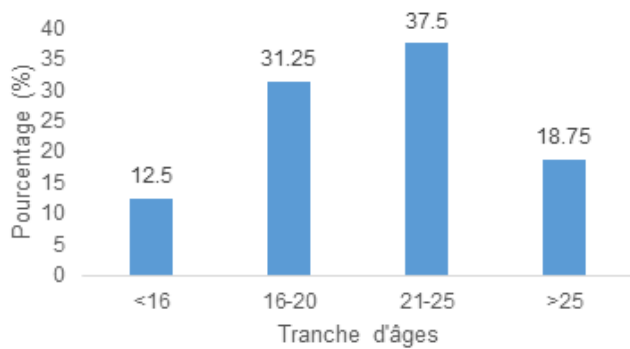


Figure 5 : répartition des patients selon la tranche d'âge

Le délai médian de consultation était de 25 heures [17-36] avec des extrêmes entre 0 et 82 heures. Les délais de consultations de moins de 6 heures ont été respectés par 21 patients (43,75%). Le côté le plus atteint était le droit (36 patients soit 75%) et le côté gauche, 12 patients soit 25%. La moitié des patients avaient des antécédents. Parmi eux, 9 patients (37,5%) avaient eu un traumatisme scrotal, 3 patients (12,5%) avaient la cryptorchidie et 12 patients (50%) avaient des douleurs testiculaires (Tableau I).

Tableau I : répartition des patients selon les antécédents

Antécédents	Effectifs	Pourcentage (%)
Traumatisme scrotal	9	37,5%
Cryptorchidie	3	12,5%
Douleurs testiculaires	12	50%
Total	24	100

Tous les patients présentaient une douleur de l'hémibourse. Cette douleur était de survenue brutale chez 39 patients (81,25%), d'emblée maximale chez 45 patients soit 93,75% et irradiait vers l'aîne chez 15 patients (31,25%). Elle empêchait la marche normale chez 21 patients (43,75%). Des symptômes digestifs ont été retrouvés chez 12 patients soit 25%. Les signes cliniques sont dominés par la tuméfaction scrotale unilatérale chez 45 patients (93,75%), le signe du gouverneur chez 42 patients (87,5%) et le signe de Prehn chez 39 patients (81,25%). Le réflexe crémasterien a été retrouvé chez 9 patients (18,75%), les signes de l'inflammation ont été retrouvés chez 6 patients (12,5%) et une vacuité scrotale controlatérale a été retrouvée chez 3 patients (6,25%) (Tableau II).

L'échographie avait été réalisée chez 12 patients (25%). Tous les patients ont été opérés d'une scrototomie exploratrice avec une incision sur le raphé médian. Le délai médian de prise en charge chirurgicale (délai entre l'admission et la chirurgie) était de 8 heures [5-12] avec des extrêmes entre 30 minutes et 28 heures. En per opératoire, nous avons découvert une torsion intra vaginale chez tous les patients. Le nombre de spires du cordon spermatique variait entre 01 et 03 tours de spires avec une moyenne de 02 tours de spires toutefois nous avons retrouvé 3 cas de détorsion spontanée.

Le testicule était viable chez 9 patients (18,75%), violacé chez 12 patients (25%) et noir chez 27 patients (56,25%). Tous les testicules violacés ont récupéré une coloration normale après réanimation.

Tableau II : répartition des patients selon leurs signes et symptômes

Données cliniques	Effectifs	Pourcentage (%)
Symptômes		
Douleur de l'hémibourse	48	100
Survenue brutale	39	81,25
D'emblée maximale	45	93,75
Irradiation vers l'aîne	15	31,25
Symptômes digestifs	12	25%
Signes		
Tuméfaction scrotale unilatérale	45	93,75
Signe du gouverneur	42	87,5
Signe de Prehn	39	81,25
Reflexe crémasterien	9	18,75
Signes de l'inflammation	6	12,5
Vacuité scrotale controlatérale	3	6,25

L'échographie avait été réalisée chez 12 patients (25%). Tous les patients ont été opérés d'une scrototomie exploratrice avec une incision sur le raphé médian. Le délai médian de prise en charge chirurgicale (délai entre l'admission et la chirurgie) était de 8 heures [5-12] avec des extrêmes entre 30 minutes et 28 heures. En per opératoire, nous avons découvert une torsion intra vaginale chez tous les patients. Le nombre de spires du cordon spermatique variait entre 01 et 03 tours de spires avec une moyenne de 02 tours de spires toutefois nous avons retrouvé 3 cas de détorsion spontanée. Le testicule était viable chez 9 patients (18,75%), violacé chez 12 patients (25%) et noir chez 27 patients (56,25%). Tous les testicules violacés ont récupéré une coloration normale après réanimation.

Le geste chirurgical était la détorsion et une orchidopexie chez 18 patients (37,5%), une détorsion et une orchidectomie chez 27 patients (56,25%) et une orchidopexie sans détorsion chez 3 patients (6,25%) car il y avait une absence de torsion en per opératoire mais des signes de souffrances testiculaires étaient présents. Tous les malades ont été pris en charge en ambulatoire. Nous avons eu 3 patients qui ont présenté un retard de cicatrisation. Ces patients avaient tous eu une orchidectomie.

Discussion

La TCS présente classiquement deux pics de fréquence chez l'enfant : la période néonatale et l'adolescence [8]. Dans notre étude, la majorité des patients ont développé une torsion du cordon spermatique après l'âge de 15 ans et en particulier à l'âge adulte. De nombreuses études africaines sont

en faveur d'une torsion du cordon spermatique qui survient en moyenne après l'âge de 15 ans [8,9,10] bien qu'Odzebe et al. [9] travaillaient sur des patients de plus de 18 ans. La tranche d'âge est similaire à certaines études [10,11,12]. La tranche d'âge la plus représentée était celle de 20 à 25 ans. Ce résultat est similaire à celui de Odzebe et al. et Kaboré et al. [9,12]. Tout ceci, en plus du fait que nous ayons 31,25% des patients qui ont présenté une TCS, montre que l'adulte jeune n'est pas épargné par la TCS. Ainsi, en Afrique, l'adulte jeune pourrait constituer un pic de fréquence surtout en Afrique Centrale.

Le délai médian de consultation était de 25 heures avec des extrêmes entre 0 et 82 heures. Au regard du résultat d'Odzebe et al. et Kaboré et al., nous pouvons confirmer que la prise en charge de la TCS est tardive en Afrique subsaharienne. Nous pouvons expliquer ce retard par des difficultés d'accès aux centres de soins (pauvreté, éloignement des centres de soins) et à des considérations socioculturelles (difficulté des patients à parler de leurs problèmes génitosexuels) tout comme Kaboré et al. mais à cela, nous ajoutons l'automédication pratiquée par les parents en raison de la pauvreté et le retard de référence de certaines structures ayant des difficultés à poser ce type de diagnostic et donc l'insuffisance de structures spécialisées [12] et l'acceptabilité de la chirurgie par les parents (au Cameroun, on est majeur à partir de 21 ans) et les patients eux-mêmes [9]. Toutefois, les délais de consultations de moins de 6 heures ont été respectés par 21 patients (43,75%), ce qui démontre qu'il est possible de consulter à moins de 6 heures. Sarr et al. retrouvaient 15,7% de patients ayant consulté avant 6h [13]. Théoriquement, au-delà de six heures d'évolution, il peut survenir des lésions histologiques qui peuvent compromettre les fonctions endocrines et exocrines du testicule [12]. Le délai de six heures est une donnée statistique et non un délai de sécurité, car il existe des cas d'orchidectomie avant la sixième heure [14,15].

Le côté le plus atteint était le droit (36 patients soit 75%) et le côté gauche, 12 patients soit 25%. Dans l'étude d'Odzebe et al. au Congo, le côté droit était aussi le plus prédominant [9] alors que dans l'étude de Ndiemoi et al. [16] en Côte d'Ivoire, le côté gauche était le plus concerné. Il est à se demander si les hommes d'Afrique Centrale ne partagent pas dans une certaine mesure des anatomies similaires.

La moitié des patients avaient des antécédents. Parmi eux, 9 patients (18,75%) avaient eu un traumatisme scrotal, 12 patients (25%) avaient des douleurs testiculaires. Kaboré et al. avaient trouvé trois patients (5,9 %) ayant des antécédents de douleurs aiguës des bourses avec rémissions spontanées sans traitement [12]. Odzebe et al. avaient trouvé deux patients ayant des antécédents dont un avec antécédent d'orchidectomie pour torsion

du testicule controlatéral survenue 3 ans avant et un autre patient avait une atrophie du testicule controlatéral secondaire à une symptomatologie similaire survenue 8 ans plus tôt et dont les parents avaient refusé la chirurgie [9]. La douleur peut avoir été précédée d'épisodes similaires de résolution spontanée, qualifiés de « subtorsions », et fortement évocateurs du diagnostic [12].

Tous les patients présentaient une douleur de l'hémibourse. Ce résultat rejoint les données de la littérature [9-12,14,17]. Cette douleur était de survenue brutale chez 39 patients (81,25%), d'emblée maximale chez 45 patients soit 93,75% et irradiait vers l'aine chez 15 patients (31,25%). Une douleur scrotale unilatérale, spontanée, brutale, d'emblée maximale est le motif de consultation le plus fréquent des TCS chez l'adulte et l'adolescent [18,19]. Ces trouvailles doivent nous emmener à évoquer le diagnostic de TCS devant un patient qui présente une bourse aigue et un antécédent de douleur testiculaire ou une orchidectomie en plus de la clinique. Fofana précisait l'absence de signes infectieux et urinaires [20]. Elle empêchait la marche normale chez 21 patients (43,75%). Ce résultat montre que la marche est un paramètre à prendre en compte dans le diagnostic de la TCS. Des signes digestifs ont été retrouvés chez 12 patients soit 25%. Bah et al. retrouvaient 11,1% de patients.

Les signes cliniques sont dominés par la tuméfaction scrotale unilatérale chez 45 patients (93,75%). Ce résultat est similaire à celui de Bah et Ndiemoi [10,16] mais différait du résultat de Kaboré et al. retrouvant d'abord le signe du gouverneur (92,5%) [12]. Nous avons trouvé le signe du gouverneur chez 87,5% des patients. Le signe du Gouverneur est un signe pathognomonique de la TCS et doit être systématiquement recherché chez tout patient présentant une douleur testiculaire [12,14]. Malgré ces différences, la tuméfaction scrotale et le signe du Gouverneur sont des signes prédominant de la TCS [8,10,11,12]. Le signe de Prehn trouvé chez 81,25% des patients est un élément important de l'examen physique pour déterminer une orchio-épididymite bien que certaines études dont celle de Sarr et al. [10,13] trouvent que le signe de Prehn n'est pas aussi sensible et ne semble donc pas être un élément fort de l'examen physique dans le diagnostic de la TCS. Toutefois, il doit être utilisé en complément de la tuméfaction scrotale objectivée à l'inspection et du signe du Gouverneur mis en évidence à la palpation. Cependant, il garde une place de choix si le patient est vu tôt [10]. Le réflexe crémasterien a été retrouvé chez 18,75% des patients.

L'échographie doppler des testicules avait été réalisée chez 12 patients (25%). L'échographie couplée au doppler est un outil important pour le diagnostic différentiel entre TCS et orchio-épididymite

en montrant une diminution du flux sanguin (dans le cordon et en intraparenchymateux) et la présence ou non de spires au niveau du cordon [21]. Cependant, des faux-négatifs persistent lors de cet examen, par exemple, du fait d'une augmentation du flux intratesticulaire lors d'un épisode de torsion-détorsion, ou lors d'une torsion vue précocement, ou lors d'une torsion incomplète [13]. Sauvât et al. [8] avaient conclu que l'échographie scrotale pouvait être faussement rassurante et retardait l'intervention et que la seule attitude défendable était l'exploration chirurgicale au moindre doute. Sarr et al. pensaient que l'échographie non seulement retarde la prise en charge, mais nécessite aussi un coût financier non négligeable dans nos régions. De plus, l'existence de faux-négatifs pourrait avoir des conséquences sur le plan médico-légal et être le point de départ de contentieux juridiques [13]. Il est vrai que l'échographie scrotale avec examen doppler du cordon ne remplacera jamais l'exploration chirurgicale mais elle peut, néanmoins, s'avérer utile lorsque le patient est vu tardivement ou dans l'exploration des douleurs testiculaires douteuses pour conforter le diagnostic [22]. Par ailleurs, en raison du nombre élevé de scrototomies blanches et face aux cas vus tardivement, certains auteurs proposent des examens d'imagerie médicale pour confirmer le diagnostic de TCS [23]. C'est ainsi qu'au vue de l'étude de Negra et al. qui avaient rapporté qu'aucun testicule n'a pu être sauvé après la 48e heure [14], nous pensons qu'après 48 heures, dans un but médico-légal, l'échographie doppler des testicules garde une place importante en ce sens que l'échographie montrera l'absence de vascularisation testiculaire et renforcera la décision de l'orchidectomie. Le délai médian de prise en charge chirurgicale (délai entre l'admission et la chirurgie) était de 8 heures [5-12] avec des extrêmes entre 30 minutes et 28 heures.

Tous les patients ont été opérés d'une scrototomie exploratrice avec une incision sur le raphé médian. La TCS étant une urgence chirurgicale, son traitement ne peut être que chirurgical comme constaté dans la majorité des études [9-14, 18, 20, 21]. En peropératoire, nous avons découvert une torsion intra vaginale chez tous les patients. Ce résultat rejoint celui de Ouattara [11] mais d'après l'étude de Fofana, il n'y a pas de corrélation entre le type de torsion et la nécrose [19]. Le nombre de spires du cordon spermatique était en moyenne de 02 tours de spires. Ndimoi et al. [16] en Côte d'Ivoire et Ntang et al. [24] à Libreville ont observé que les patients ayant un testicule non viable avaient un nombre de tours de spires supérieur ou égal à deux. Ce résultat pourrait s'expliquer par un étranglement plus important du pédicule vasculaire entraînant une ischémie, une hypoxie et une nécrose rapide du testicule [16]. Le nombre de tour de spires constitue donc un facteur essentiel de survenue rapide d'une nécrose testiculaire. Dans ce même

sens Fofana et al trouvaient une corrélation entre le nombre de tours des spires est supérieur ou égal à 2 et la nécrose testiculaire [19].

Le testicule était violacé chez 25% des patients. Tous les testicules violacés ont récupéré une coloration normale après réanimation. Après détorsion d'un testicule qui semblait être nécrosé, certains auteurs ont retrouvé une recoloration spectaculaire du testicule [18]. Ceci démontre l'importance de la détorsion précoce et de la réanimation testiculaire.

Le testicule était nécrosé chez 27 patients (56,25%) et le geste chirurgical était une détorsion et orchidectomie. Ce résultat est similaire à celui de plusieurs séries africaines [9, 11, 12, 13]. Le chiffre important d'orchidectomie est en rapport avec plusieurs éléments dont le retard de consultation. Fofana et al. retrouvaient une corrélation entre le délai de consultation tardif et la nécrose ; le retard diagnostique, le retard de prise en charge, les aspects financiers et socio-culturels et les accès aux hôpitaux [19]. Fofana et al. ne retrouvaient pas de corrélation entre la latéralité (droite ou gauche) et la nécrose [19].

Une orchidopexie controlatérale devant un testicule viable et une orchidopexie controlatérale sont réalisés dans le même temps opératoire. L'orchidopexie controlatérale est différée devant un testicule nécrosé du fait du risque septique. Odzebe et al. mentionnaient la logique de différer l'orchidopexie controlatérale devant un testicule nécrosé [9]. Ceci était en accord avec certains auteurs [2, 10, 19]. Cependant, d'autres auteurs réalisent une orchidopexie controlatérale systématique dans le même temps opératoire. Cette attitude était justifiée par les risques réels de torsion ultérieure du testicule controlatéral qui est de 3 à 18 % [18]. Pour éviter le passage d'anticorps anti-spermatoïdes dans la circulation systémique, nous prescrivons des corticoïdes sur 5 jours. Sarr et al. [13], dans leur pratique, optait d'emblée pour une orchidectomie, sans détorsion préalable d'un testicule noirâtre ou chocolaté

Tous les malades ont été pris en charge en ambulatoire. Nous avons eu 3 patients qui ont présenté un retard de cicatrisation. Ces patients avaient tous eu une orchidectomie. Tout comme dans certaines séries rapportées [10, 13, 14], la mortalité était nulle et la morbidité s'était résumée à des complications locales. Dans notre étude, il s'agissait de complications locales à type de retard de cicatrisation.

Conclusion

La torsion du cordon spermatique constitue une urgence chirurgicale urologique dont le pronostic fonctionnel dépend étroitement de la précocité de la prise en charge. Elle touche préférentiellement l'adulte jeune, avec une nette prédominance du côté

droit. Il y a un retard dans le diagnostic et la prise en charge traduisant un taux élevé d'orchidectomie. Sur le plan clinique, la douleur scrotale unilatérale d'apparition brutale, la tuméfaction et la présence du signe du Gouverneur demeurent des indicateurs essentiels du diagnostic. Une amélioration du pronostic testiculaire passe par la sensibilisation du public et du personnel soignant à la reconnaissance précoce des signes de la torsion testiculaire et à la nécessité d'une intervention chirurgicale urgente. Le renforcement des capacités diagnostiques et la mise en place de protocoles de prise en charge rapide dans les structures de santé constituent des perspectives prioritaires pour réduire la morbidité associée à cette pathologie.

Conflit d'intérêt : Il n'y a pas de conflit d'intérêt.

Contribution des auteurs : Fouda JC a rédigé l'article, Mekeme MJB, Mbassi AA ont coordonné ce travail, Owon'Abessolo PF, Beling AYG, Epoupa NFG ont relu l'article, Moby MH, Bang GA, Angwafo III F ont supervisé ce travail.

Références

- Audenet, F., & Rouprêt, M. (2010). Les torsions du cordon spermatique : aspects du diagnostic clinique et principes thérapeutiques. *Prog Urol*. 20(11) : 810-4.
- De Mazancourt, E. S., Pradere, B., Duquesne et al. Heure limite de prise en charge opératoire pour torsion du cordon spermatique : résultats d'une série rétrospective multicentrique de 2986 patients sur 15 ans. *Prog Urol*. 2020. 30(13), 816-7.
- Jean Cedrick Fouda, Junior Bartthelemy Mekeme Mekeme, Philip Fernandez Owon'Abessolo et al. Twisting of the Spermatic Cord in an Elderly Subject at the Yaounde Central Hospital: About a Case. *OJU*, 12, 394-400.
- Avakoudjo JDG, Ouaké HI, Mensah ADE et al. Les urgences andrologiques dans un service de chirurgie générale à Parakou (Bénin). 2016. 1(6) : 301-4
- Owon'Abessolo, P. F., Mayopa, C. F., Mekeme, J. et al. Urgences urologiques : aspects épidémiologiques, cliniques et thérapeutiques à l'hôpital central de Yaoundé. *Health Sci Dis*. 2020. 21(8). Pages 52-55.
- Ngalle, F. E., Essomba, A. Q., Mbassi, A. M. et al. Profil des Urgences Urologiques dans un Hôpital Tertiaire Universitaire du Cameroun: Hôpital Général de Douala. *Health Sci Dis*. 2022. 23(9). Pages 57-60.
- Moby Mpah, E. H., Fouda, P. J., Sala-Beyeme, T. et al. Les urgences andrologiques en milieu urbain au Cameroun: aspects cliniques et thérapeutiques. *Basic and Clinical Andrology*. 2012. 22(4), 223-226.
- Sauvat F, Hennequin S, Ait Ali Slimane M, Gauthier F. Un âge pour la torsion testiculaire ? *Arch Pediatr*. 2002. 9:1226-9.
- Odzebé AWS. Torsion du cordon spermatique et des annexes testiculaires chez le sujet adulte au CHU de Brazzaville [Torsion of the spermatic cord and testicular adnexa in adults at Brazzaville University Hospital]. *Rev Afr Urol Androl*. 2018. 1(9):228.
- Bah, O. R., Roupret, M., Guirassy, S., Diallo, A. B., Diallo, M. B., & Richard, F. Aspects cliniques et thérapeutiques de la torsion du cordon spermatique: étude de 27 cas. *Prog Urol*. 2010. 20(7), 527-531.
- Ouattara, A., Paré, A. K., Yé, D., et al. Prevalence and Management of Spermatic Cord Torsion (SCT): A Five-Year Review in Sourou Sanou University Hospital of Bobo-Dioulasso (Burkina Faso). *Research and Reports in Urology*. 2023. 381-5.
- Kaboré FA, Zango B, Yaméogo C, Sanou A, Kirakoya B, Traoré SS. Les torsions du cordon spermatique chez l'adulte au CHU Yalgado Ouédraogo de Ouagadougou [Spermatic cord torsion in adults at the Yalgado Ouedraogo University Hospital of Ouagadougou]. *Basic Clin Androl*. 2011;21(4):254-9. doi:10.1007/s12610-011-0151-2
- Sarr A, Fall B, Mouss B, Sow Y, Thiam A, Diao B, Fall P.A, Diagne B.A. Aspects diagnostiques et thérapeutiques de la torsion du cordon spermatique au CHU Aristide-Le-Dantec de Dakar. *Androl*. 2010 ; 20: 203-8.
- Della-Negra E, Martin M, Bernardini S et al. Les torsions du cordon spermatique chez l'adulte. *Prog Urol*. 2000. 10:265-70.
- Mansbach JM, Forbes P, Peters C. Testicular torsion and risk factors for orchiectomy. *Arch Pediatr Adolesc Med*. 2005. 159:1167-71.
- Long-Depaquit, T., Chiron, P., Bourguoin, et al. Prise en charge de la torsion du testicule par un chirurgien généraliste isolé en Afrique. *Médecine Tropicale et Santé Internationale*, 2, mtsi.v2i2.2022.230.
- Hodonou R, Soumanou-Kaffo R, Akpo C. La torsion du cordon spermatique (TCS) : facteurs étiopathogéniques, diagnostiques et thérapeutiques à propos de 33 cas au CNHU de Cotonou. *Med Afr Noire*. 1999 46:69-74.
- Mongiart-Artus P. Torsion du cordon spermatique et des annexes testiculaires. *Ann Urol*. 2004. 38:25-34.
- Fofana, A., Tuo, L. S. M., Yao, K. E., Coulibaly, I., Yeo, D. D., & Adebayo, B. T. (2025). Our Experience in the Management of Spermatic Cord Torsion (SCT) in Adults in Urology at Cocody-Abidjan University Hospital in 10 Years (2014-2023). *OJU*, 15(5), 139-147.
- Akassimadou, N., Avion, K. P., Agui, B., et al. Torsion of the Spermatic Cord in Adults: Epidemiological, Diagnostic and Therapeutic Aspects Observed in 46 Patients at the Bouake Teaching Hospital. *Open Journal of Urology*. 2023. 13(9), 382-90.
- Kravchick S, Cytron S, Leibovici O, et al (2001) Color doppler sonography: its real role in the evaluation of children with highly suspected testicular torsion. *Eur Radiol* 11: 1000-5.
- Waldert M, Klatte T, Schmidbauer J, Remzi M, Lackner J, Marberger M. Color Doppler sonography reliably identifies testicular torsion in boys. *Urology* 2010. 75: 1170-4.
- Ali Rizvi SA, Ahmad I, Siddiqui MA, et al. Role of color doppler ultrasonography in evaluation of scrotal swellings pattern of disease in 120 patients with review of literature. *Urol J*. 2011. 8:60-5.
- Ndang, N.M. and Mougougou, A. Delay in Managing Torsion of the Spermatic Cord at the CHU of Libreville. *Bull Med Owendo*. 2018. 16, 26-31.



Facteurs de risque cardiovasculaire en milieu hospitalier du Nord-Cameroun : Etude transversale à l'Hôpital Général de Garoua

Cardiovascular risk factors in a hospital setting in Northern Cameroon : A Cross-Sectional Study at Garoua General Hospital

Hadja Inna AA^{1,2} ; Younoussa M¹ ; Hassana S¹ ; Tchameni Sidi C¹ ; Tomo JT¹ ; Deunga Njandeu R^{1,2} ; Ntyo'o Nkoumou AL^{1,3} ; Abdou Galdima M^{1,2} ; Ibrahima A⁴ ; Hamadou Ba^{1,3}

Article Original

1. Service de Médecine ; Hôpital Général de Garoua ; Cameroun
2. Département de Médecine et Pharmacopée Traditionnelle ; Faculté de Médecine et des Sciences Biomédicales. Université de Garoua ; Cameroun
3. Département de Médecine Interne et Spécialités ; Faculté de Médecine et des Sciences Biomédicales ; Université de Yaoundé I ; Cameroun
4. Département des Sciences Physiologiques et Biochimie ; Faculté de Médecine et des Sciences Biomédicales ; Université de Garoua ; Cameroun

Auteur correspondant :

Astasselbe Abba HADJA INNA,
Université de Garoua, BP 145
Garoua ; Tel : (+237) 698145634 ;
Email : hadjainna@yahoo.fr

Mots-clés : Facteurs de risque cardiovasculaire, Hôpital Général de Garoua, Cameroun

Key-words : Cardiovascular risk factors, Garoua General Hospital, Cameroon

Date de soumission: 20/08/2025

Date d'acceptation: 03/12/2025

RESUME

Objectif : Décrire le profil des facteurs de risque cardiovasculaires (FRCV) chez les patients hospitalisés dans le service de Médecine de l'Hôpital Général de Garoua (HGG).

Méthodologie : Il s'agissait d'une étude transversale sur une période de 2 ans au service de Médecine de l'HGG. Tous les dossiers de patients hospitalisés dans ce service dûment remplis ont été inclus. Les données sociodémographiques, cliniques et les FRCV ont été notés sur un questionnaire électronique préconçu et analysés par le logiciel Epi Info version 7.2.6.0.

Résultats : Au total, 207 dossiers répondants aux critères d'inclusion ont été colligés avec une prédominance masculine (59,9%) et une moyenne ($\pm$ ET) d'âge de 59,5 ($\pm$ 12,9) ans. La nationalité camerounaise était la plus représentée (89,8%) et les principales spécialités rencontrées étaient : la cardiologie (39,1%) et l'endocrinologie (30,4%). Les FRCV non modifiables étaient : le sexe masculin (59,9%), l'âge $\geq$ 50 ans chez l'homme (49,7%), l'âge $\geq$ 60 ans chez la femme (20,7%) et la ménopause (27,5%). Les FRCV modifiables étaient : l'HTA (75,8%), la sédentarité (75,9%), le diabète sucré (55,5%), la valeur de LDL-cholestérol au-delà des objectifs (43,9%), le DFG $<$ 60ml/min (35,7%), l'hyperuricémie asymptomatique ou la goutte (36%), la valeur du HDL-cholestérol en-dessous des objectifs (29,5%), l'obésité (29,5%), la consommation de tabac et d'alcool (14%). La majorité des patients étaient en prévention primaire (79,7%).

Conclusion : Les FRCV étaient fréquents dans notre étude. La prise en charge globale des patients hospitalisés réduirait significativement la morbi-mortalité cardiovasculaire rencontrée dans notre contexte.

ABSTRACT

Objective : Describe the profile of cardiovascular risk factors (CVRFs) among patients hospitalized in the Internal Medicine Department of Garoua General Hospital (HGG).

Methods : We conducted a cross-sectional study over a two-year period in the Internal Medicine Department of HGG. All fully completed medical records of hospitalized patients in this department were included, while incomplete records were excluded. Sociodemographic data, clinical information, and CVRFs were recorded using a pre-designed electronic questionnaire and analyzed with Epi Info version 7.2.6.0.

Results : A total of 207 medical records meeting the inclusion criteria were collected, with a male predominance (59.9%) and a mean age of 59.5 $\pm$ 12.9 years. Cameroonian nationality was the most represented (89.8%), and the most frequently encountered specialties were cardiology (39.1%) and endocrinology (30.4%). The non-modifiable CVRFs identified included male sex (59.9%), age $\geq$ 50 years in men (49.7%), age $\geq$ 60 years in women (20.7%), and menopause (27.5%). The modifiable CVRFs observed were hypertension (75.8%), physical inactivity (75.9%), diabetes mellitus (55.5%), LDL-cholesterol above target levels (43.9%), glomerular filtration rate $<$ 60 mL/min (35.7%), asymptomatic hyperuricemia or gout (36%), HDL-cholesterol below target levels (29.5%), obesity (29.5%), tobacco and alcohol use (14%). Primary prevention accounted for the majority of patients (79.7%).

Conclusion : Cardiovascular risk factors were frequently observed in our study. Comprehensive management of hospitalized patients could significantly reduce the cardiovascular morbidity and mortality encountered in our setting.

DOI : <https://doi.org/10.64294/jsd.v3i4.188>

Introduction

Les maladies cardiovasculaires (MCV) représentent un réel problème de santé publique dans le monde. Selon l'Organisation mondiale de la santé (OMS), elles représentent 32% des décès annuels mondiaux dont les trois-quarts surviennent dans les pays à revenu faible et intermédiaire comme le Cameroun (1). Au Cameroun, plusieurs études hospitalières ont mis en évidence une prévalence particulièrement élevée des facteurs de risque cardiovasculaire tels que l'hypertension artérielle, l'obésité, la sédentarité et le diabète sucré. À Yaoundé, une étude menée dans deux hôpitaux de référence a révélé que 79,4 % des patients hospitalisés pour MCV présentaient une hypertension artérielle, avec une mortalité hospitalière de 12 %, imputable aux complications hypertensives (2). De même, au sein de l'Hôpital Régional de Buea, 15,9 % des admissions médicales étaient dues à des maladies cardiovasculaires, dominées par l'insuffisance cardiaque et les accidents vasculaires cérébraux (3). À Ngaoundéré, les résultats convergent également vers une prédominance de l'hypertension artérielle parmi les patients admis pour MCV, mettant en lumière l'ampleur de cette problématique dans différentes régions du pays (4). Au-delà des patients hospitalisés, des enquêtes menées auprès des employés du Centre Hospitalier Universitaire de Yaoundé ont souligné la forte prévalence des facteurs comportementaux de risque tels que la sédentarité (88,5 %) et l'obésité abdominale (47,8 %), traduisant une exposition généralisée au sein même du personnel de santé (5). Face à ce fardeau croissant, une meilleure compréhension des facteurs de risque cardiovasculaires dans le milieu hospitalier s'avère essentielle pour orienter les stratégies de dépistage précoce et de prise en charge inclusive. C'est dans cette optique que la présente étude se propose de décrire le profil des facteurs de risque cardiovasculaires chez les patients hospitalisés dans le service de médecine de l'Hôpital Général de Garoua.

Méthodologie

Il s'agissait d'une étude transversale rétrospective qui s'est déroulée sur une durée de deux ans allant du 1er Septembre 2022 au 31 Août 2024 dans le service de médecine de l'Hôpital Général de Garoua (HGG). C'est un hôpital de 1ère catégorie situé dans la capitale de la région du Nord-Cameroun (population : près de 2,5 millions) et ouvert au public depuis le 1er septembre 2022. Il est accessible par une voie principale parfaitement bitumée et situé à 15 minutes du centre-ville. Il est constitué d'une dizaine d'unités réparties en 3 groupes : les services administratifs, les services cliniques et les services d'appui. Le service de médecine est fonctionnel, incluant une unité d'éducation thérapeutique, une unité d'explorations fonctionnelles et une unité

d'hospitalisation conventionnelle d'une capacité de 28 lits. Y sont hospitalisés les patients présentant des pathologies de toutes les spécialités de médecine interne stables sur le plan vital. Nous avons inclus tous les dossiers de patients hospitalisés pendant la période de l'étude. Les dossiers incomplets ne comportant pas des données cliniques et/ou examens complémentaires permettant d'identifier les facteurs de risques cardiovasculaires étaient exclus. Pour cette étude intra hospitalière, nous avons procédé à un échantillonnage consécutif non probabiliste et exhaustif. Les dossiers des patients hospitalisés dans le service de médecine ont été ressortis des archives. Un questionnaire électronique préétabli, confectionné à l'aide du logiciel Epi info version 7.2.6.0 a été rempli permettant une saisie directe des données pendant l'enquête. Les données suivantes ont été recueillies les données sociodémographiques (l'âge, le sexe, la nationalité, la spécialité d'hospitalisation et la région de résidence), les facteurs de risque cardiovasculaires (FRCV) (le sexe masculin, l'âge >50ans chez l'homme ou >60ans chez la femme, l'hypertension artérielle, le diabète sucré, la maladie cardiovasculaire connue, la maladie rénale connue, l'hyperuricémie/goutte connue, la ménopause, la dyslipidémie, le tabagisme, la consommation d'alcool, le stress, l'insomnie, la sédentarité, l'antécédent familial de maladie cardiovasculaire précoce., l'examen clinique général (la prise de poids, la mesure de la taille, de la circonférence abdominale et de la pression artérielle par des procédures standardisées, l'indice de masse corporelle (IMC), les données biologiques (l'hémoglobine glyquée, la créatininémie avec calcul du débit de filtration glomérulaire (DFG), la valeur de l'acide urique plasmatique, le dosage des paramètres lipidiques). Les données collectées et analysées par le logiciel Epi Info 7.2.6.0. Les variables quantitatives ont été présentées sous forme de médiane (intervalle interquartile) ou moyenne ($\pm$ écart-type=ET) en fonction de la distribution des données qu'elle soit gaussienne ou pas. Les variables qualitatives ont été présentées sous forme d'effectifs et de fréquence.

Résultats

Durant la période d'étude, nous avons colligé 207 dossiers sur un total de 423 patients admis dans le service, soit une couverture de 49%. La moyenne ($\pm$ ET) d'âge de la population d'étude était de 59,5 ($\pm$ 12,9) ans. La répartition selon le sexe met en évidence une prédominance masculine avec 124 patients (59,9%) et 83 femmes (40,1%). La nationalité la plus représentée était la nationalité camerounaise [186 (89,8%)] suivie de la nationalité tchadienne [18 (8,7%)] et de la nationalité nigériane [3 (1,4%)] (Figure 1). Les principales sous-spécialités de la médecine interne rencontrées étaient : la cardiologie [81 (39,1%)], l'endocrinologie [63 (30,4%)], la neurologie [43 (20,7%)] et la pneumologie [7 (3,4%)] (Tableau I).

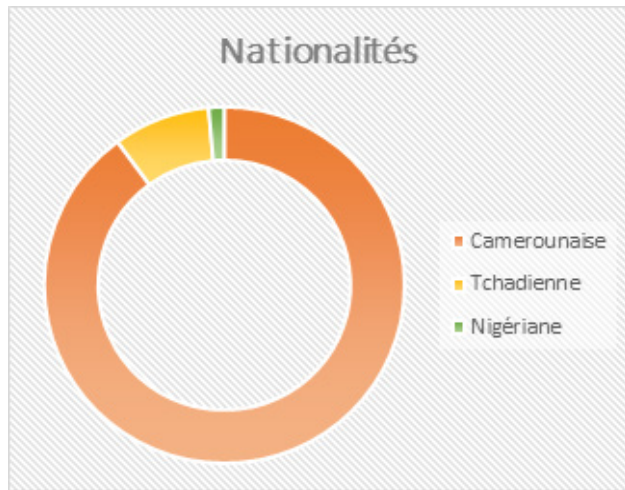


Figure 1 : nationalités de la population d'étude

Tableau I : Sous-spécialités d'hospitalisation

Sous-spécialités	Effectif (N=207)	Fréquence (%)
Cardiologie	81	39,1
Endocrinologie	63	30,4
Neurologie	43	20,7
Pneumologie	7	3,4
Hépto-gastro-entérologie	4	1,93
Rhumatologie	3	1,45
Néphrologie	4	1,93
Infectiologie	2	0,97

Les facteurs de risque cardiovasculaires non modifiables identifiés dans la population d'étude étaient : le sexe masculin [124 (59,9%)] ; l'âge ≥ 50 ans chez l'homme [103 (49,7%)], l'âge ≥ 60 ans chez la femme [43 (20,7%)] et la ménopause [57 (27,5%)] (Tableau II).

Tableau II : facteurs de risque cardiovasculaires non modifiables

Variable	Effectif (N=207)	Fréquence (%)
Sexe masculin		
Oui	124	59,9
Non	83	40,1
Age à risque >50 ans chez l'homme		
Oui	103	83,1
Non	21	16,9
Age à risque >60 ans chez la femme		
Oui	43	51,8
Non	40	48,2
Ménopause		
Oui	57	68,7
Non	26	31,3

Facteurs de risque modifiables

Les facteurs de risque cardiovasculaires modifiables identifiés dans la population d'étude étaient : l'HTA [157 (75,8%)], la sédentarité [139 (75,9%)] le diabète

sucré [115 (55,5%)], la valeur de LDL-cholestérol au-delà des objectifs [91 (43,9%)], le DFG <60 ml/mn [74 (35,7%)], l'hyperuricémie/goutte [72 (36%)], la valeur du HDL-cholestérol en-dessous des objectifs [61 (29,5%)], l'obésité [61 (29,5%)], la consommation de tabac et d'alcool [29 (14%)] (Tableau III).

Tableau III : Facteurs de risque cardiovasculaires modifiables

Variable	Effectif (N=207)	Fréquence (%)
Hypertension artérielle		
Oui	124	59,9
Non	83	40,1
Diabète sucré		
Oui	103	83,1
Non	21	16,9
LDL-cholestérol au-delà des objectifs		
Oui	43	51,8
Non	40	48,2
DFG <60 ml/mn		
Oui	57	68,7
Non	26	31,3
Hyperuricémie/Goutte		
Oui	72	36
Non	135	64
HDL-cholestérol au-dessous des objectifs		
Oui	61	29,5
Non	146	70,5
Obésité		
Oui	61	29,5
Non	146	70,5
Tabagisme		
Oui	29	14
Non	178	86
Alcool		
Oui	29	14
Non	178	86

Prévention cardiovasculaire

Quarante-deux patients (20,3%) avaient une maladie cardiovasculaire connue et documentée donc en prévention secondaire (Figure 2).

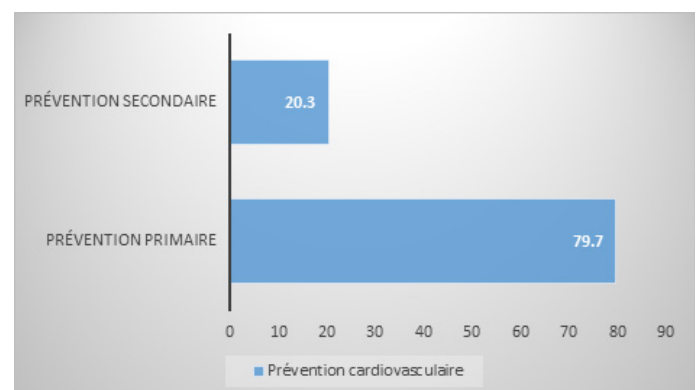


Figure 2 : prévention cardiovasculaire

Discussion

Notre étude dont l'objectif principal était de décrire le profil des facteurs de risque cardiovasculaires chez les patients hospitalisés dans le service de médecine de l'Hôpital Général de Garoua a concerné 207 dossiers médicaux répondant aux critères d'inclusion. Il en ressort que la population d'étude était à prédominance masculine (59,9%) et la moyenne ($\pm$ ET) d'âge était de 59,5 ($\pm$ 12,9) ans. Les principaux facteurs de risque cardiovasculaires identifiés étaient : la sédentarité (75,9%), l'HTA (75,8%), le sexe masculin (59,9%), le diabète sucré (55,5%) et l'âge $\geq$ 50 ans chez l'homme (49,7%). La majorité des patients étaient en prévention primaire (79,7%).

Données générales de la population d'étude

La prédominance masculine ainsi que la moyenne d'âge de la cinquantaine observées dans notre étude concordent avec les résultats rapportés par Hadja Inna et al., qui avaient décrit des caractéristiques similaires chez les patients atteints de diabète sucré dans la même structure sanitaire (8,9). La prédominance de la nationalité camerounaise (89,8 %) s'explique par la localisation géographique de l'HGG. La présence de patients d'autres nationalités, notamment tchadienne et nigériane, témoigne toutefois du rôle de l'HGG en tant que centre de référence sous-régional. La prédominance des patients relevant de la cardiologie (39,1%) et de l'endocrinologie (30,4%) est expliquée par le fait que les spécialistes de ces disciplines ont été intégrés parmi les premiers au sein du service. Cette arrivée précoce a conduit à ce que les patients soient orientés de manière prioritaire vers ces sous-spécialités, entraînant ainsi une représentation plus élevée par rapport aux autres sous-spécialités de la médecine interne.

Facteurs de risque cardiovasculaire

Les principaux facteurs de risque cardiovasculaires identifiés dans plus de la moitié des patients étaient : la sédentarité (75,9%), l'HTA (75,8%), le sexe masculin (59,9%), le diabète sucré (55,5%) et l'âge $\geq$ 50 ans chez l'homme (49,7%).

La population africaine avec les mutations socio-culturelles et la modernisation exponentielle est devenue une population à majorité sédentaire (10). Cette inactivité physique fait le lit à la surcharge pondérale et secondairement aux maladies métaboliques associées. Plusieurs études en contexte africain mettent en évidence des résultats similaires à savoir 77,9% à Bamako au Mali et 88,5% à Yaoundé au Cameroun (5,11).

L'HTA est un facteur de risque cardiovasculaire majeur et apparaît comme un tueur silencieux tant elle est d'évolution silencieuse. Pour chaque augmentation de 20mmHg de la pression systolique ou de 10 mmHg de la pression diastolique, le risque

d'AVC et de coronaropathie double (6). La fréquence de l'HTA retrouvée dans notre étude (75,8%) est similaire à celle retrouvée par Boombhi et al. en 2016 à Yaoundé de 79,4% chez des patients hospitalisés pour maladies cardiovasculaires (2).

Bien qu'il soit admis que le nombre absolu de décès cardiovasculaires soit plus élevé chez les femmes que chez les hommes après 65 ans ; avant cet âge la mortalité cardiovasculaire masculine est 3 à 4 fois supérieure à celle des femmes. Le sexe masculin associé à un âge de plus de 50 ans s'avère donc être un facteur de risque cardiovasculaire non modifiable indépendant. La surmortalité cardiovasculaire masculine pourrait s'expliquer par l'absence de protection hormonale, une exposition plus précoce aux facteurs de risque et un recours tardif aux soins, entraînant une prise en charge moins optimale. La prédominance masculine dans les services d'hospitalisation reflète une incidence plus élevée de certaines pathologies, des comportements à risque plus fréquents chez les hommes, ainsi qu'un accès limité des femmes aux structures hospitalières dans notre contexte (8,9,11).

Le risque cardiovasculaire est majoré d'un facteur 2 à 4 chez les patients atteints de diabète, ce qui le place comme un facteur de risque cardiovasculaire majeur. Son association avec l'HTA majore encore plus le risque cardiovasculaire chez les patients à risque. Sa prévalence est de plus en plus inquiétante en Afrique du fait de la sédentarisation de la population et surtout de la part des cas non diagnostiqués qui représentent près de 2 patients/3 (12).

Tous les autres facteurs de risque cardiovasculaires étaient présents dans notre population d'étude malgré leur faible fréquence.

Limite de l'étude

La principale limite de notre étude était la collecte des données rétrospective rendant difficile l'accès à tous les dossiers médicaux qui en plus étaient parfois incomplètement remplis. Ce qui les excluait systématiquement de la collecte.

Conclusion

Les facteurs de risque cardiovasculaires majeurs étaient fréquents dans notre étude soulignant l'importance d'une identification précoce et d'une gestion rigoureuse de ces déterminants. La mise en place d'une prise en charge globale incluant la prévention, le contrôle thérapeutique et l'éducation des patients hospitalisés réduiraient significativement la morbi-mortalité cardiovasculaire rencontrée dans notre contexte.

Références

1. World Health Organization. Maladies cardiovasculaires [Internet]. Genève : World Health Organization; [cité 29 avr 2025]. Disponible sur : <https://www.who.int/fr/health-topics/cardiovascular-diseases>

2. Boombhi J, Menanga A, Doualla JP, Hamadou B, Kuete L, Ntep M, Kingue S. Prévalence et mortalité des maladies cardiovasculaires en milieu hospitalier camerounais : cas de deux hôpitaux de référence de la ville de Yaoundé. *Tropical Cardiology* [Internet]. [cité 29 avr 2025]. Disponible sur: <http://tropical-cardiology.com/Accueil/index.php/2013-08-10-06-44-55/volume-n-145/177-prevalence-et-mortalite-des-maladies-cardiovasculaires-en-milieu-hospitalier-camerounais-cas-de-deux-hopitaux-de-reference-de-la-ville-de-yaounde>
3. Nkoke C, Jingi AM, Makoge C, Teuwafeu D, Nkouonlack C, Dzudie A. Epidemiology of cardiovascular diseases related admissions in a referral hospital in the South West region of Cameroon: a cross-sectional study in sub-Saharan Africa. *PLoS One* [Internet]. 2019 Déc 19 [cité 28 avr 2025];14(12):e0226644. Disponible sur: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6922399/>
4. Mbouemboue OP, Ngoufack JO, Koonak AK, Maha F, Kingue S. Place et profil évolutif des maladies cardiovasculaires en milieu hospitalier nord camerounais : le cas de l'hôpital régional de Ngaoundéré. *Health Sci Dis* [Internet]. 2015 mars 28 [cité 28 avr 2025];16(1). Disponible sur: <https://www.hsd-fmsb.org/index.php/hsd/article/view/470>
5. Amougou SN, Epok LE, Mfeukeu LK, Hamadou B, Musa AJ, Jemea B, et al. Prevalence of cardiovascular risk factors among the employees of the Yaoundé University Teaching Hospital. *Health Sci Dis* [Internet]. 2017 oct 2 [cité 29 avr 2025];18(4). Disponible sur: <http://www.hsd-fmsb.org/index.php/hsd/article/view/935>
6. Société Française de Cardiologie. Chapitre 02 – Item 222 : Facteurs de risque cardiovasculaire et prévention [Internet]. [cité 13 mai 2025]. Disponible sur: <https://www.sfcadio.fr/publication/chapitre-02-item-222-facteurs-de-risque-cardiovasculaire-et-prevention/>
7. Andrade Lopes S, Jornayvaz FR, De Seigneux S. Insuffisance rénale chronique et nouveaux traitements antidiabétiques : tour d'horizon en 2019. *Rev Méd Suisse* [Internet]. 2019 [cité 2 mai 2025];15(653):1106-11. Disponible sur: <https://www.revmed.ch/revue-medicale-suisse/2019/revue-medicale-suisse-653/insuffisance-renale-chronique-et-nouveaux-traitements-antidiabetiques-tour-d-horizon-en-2019>
8. Inna AAH, Ibrahima A, Boli A, Djeugoue P, Deunga R, Aminou DS, et al. Le diabète sucré en milieu hospitalier dans le Nord du Cameroun : aspects épidémiocliniques, paracliniques et thérapeutiques. 2024;25.
9. Inna AAH, Njandeu RD, Oumarou M, Ibrahima A, Sidi CT, Hassana S, et al. Asymptomatic hyperuricemia in type 2 diabetic patients in Northern Cameroon: prevalence and determinants. *Open J Endocr Metab Dis* [Internet]. 2025 juil 16 [cité 31 juil 2025];15(7):111-22. Disponible sur: <https://www.scirp.org/journal/paperinformation?paperid=144378>
10. World Health Organization. WHO Diabetes VN Hanoi image [Internet]. [cité 29 avr 2025]. Disponible sur: https://cdn.who.int/media/images/default-source/default-album/who-diabetes-vn-ha-nam-who-diabetes-vn-hanoi-dsc07650.tmb-1920v.jpg?sfvrsn=94b9b70a_6%201920w
11. Dangbui KRE. Dépistage des facteurs de risque cardiovasculaire dans le service de médecine interne du CHU-Point G [Internet] [thèse]. Bamako : Université des Sciences, des Techniques et des Technologies de Bamako; 2023 [cité 28 avr 2025]. Disponible sur: <https://www.bibliosante.ml/handle/123456789/6009>
12. Magliano DJ, Boyko EJ, Genitsaridi I, Piemonte L, Riley P, Salpea P, éditeurs. *IDF Diabetes Atlas 2025* [Internet]. 11^e éd. Bruxelles : International Diabetes Federation; 2025 [cité 9 avr 2025]. Disponible sur: <https://diabetesatlas.org/resources/idf-diabetes-atlas-2025/>



Determinant related to amputation and mortality among patients with diabetic foot at Yaoundé central Hospital

Déterminant lié à l'amputation et à la mortalité chez les patients atteints du pied diabétique à l'hôpital central de Yaoundé

Ekani Boukar M¹, Mokake D¹, Mbelle RII², Wagnoun Y¹, Ousmana O.³, Savom Ec², Nana T¹, Ngwane A.¹, Bang GA², Chichom M.¹, Essomba A², Ngowe²

Original Article

1. Faculty of Health Sciences, University of Buea, Cameroon
2. Faculty of Medicine and Biomedical Sciences, University of Yaounde 1, Cameroon
3. Faculty of Medicine and Biomedical Sciences, University of Garoua

Corresponding author: Ekani Boukar Mahamat, Faculty of Health Sciences, University of Buea, Cameroon, Email : boukaryoussouf@gmail.com, Tel : (+237) 677569797

Keywords: Amputation and mortality related to diabetic foot outcomes, risk factors, Yaoundé, Cameroon.

Mots-clés : Amputation et mortalité liées au pied diabétique ; Facteurs de risque ; Yaoundé ; Cameroun.

Date de soumission: 03/09/2025

Date d'acceptation: 03/12/2025

ABSTRACT

Background: Diabetic foot complications (DFC) are a significant cause of morbidity and mortality worldwide, often leading to amputations and death. This study aimed to identify the determinants of amputation and mortality outcomes among diabetic foot patients at the Yaoundé Central Hospital in Cameroon.

Methods: This was a retrospective descriptive study of medical records for 329 patients with diabetic foot admitted between January 2019 and December 2021. We collected data on patient demographics, comorbidities, laboratory findings, and clinical presentation using the Wagner classification. The primary outcomes were lower-limb amputation and mortality. We performed a multivariate logistic regression to identify factors associated with amputation and mortality related to diabetic foot outcomes.

Results: The mean age of the patients was 57.9 years, with 66% having type 2 diabetes. The most common comorbidities were heart failure (38%) and hypertension (33.7%). The study found a high rate of poor outcomes, with 75 patients (22.8%) undergoing amputation and 77 patients (23.4%) dying. Multivariate analysis revealed that dyslipidemia (adjusted odds ratio [aOR]: 2.942) and a Wagner classification ≥ 4 (aOR: 0.053) were significant, independent predictors of adverse outcomes.

Conclusion: The presence of dyslipidemia and a high-grade Wagner classification are critical determinants of poor outcomes in diabetic foot patients at Yaounde central hospital. These findings underscore the urgent need for enhanced screening, aggressive lipid management, and timely, specialized care for severe diabetic foot disease to reduce the high rates of amputation and mortality.

RESUME

Introduction : Les complications du pied diabétique représentent une cause majeure de morbidité et de mortalité dans le monde. Le but de l'étude était d'identifier les déterminants liés à l'amputation et la mortalité chez les patients présentant un pied diabétique à l'Hôpital Central de Yaoundé.

Méthodes : Il s'agissait d'une étude rétrospective descriptive portant sur 329 patients hospitalisés pour pied diabétique entre janvier 2019 et décembre 2021. Les données démographiques, cliniques, biologiques et la classification de Wagner ont été collectées. Les issues défavorables retenues étaient l'amputation du membre inférieur et la mortalité. Une régression logistique multivariée a été utilisée pour identifier les facteurs associés.

Résultats : L'âge moyen des patients était de 57,9 ans ; 66 % présentaient un diabète de type 2. Les comorbidités les plus fréquentes étaient l'insuffisance cardiaque (38 %) et l'hypertension artérielle (33,7 %). Les résultats ont montré un taux élevé d'issues défavorables : 22,8 % d'amputations (75 patients) et 23,4 % de décès (77 patients). L'analyse multivariée a révélé que la dyslipidémie (OR ajusté : 2,94) et une classification de Wagner ≥ 4 (OR ajusté : 0,053) étaient des prédicteurs indépendants significatifs des issues défavorables.

Conclusion : La présence de dyslipidémie et un stade avancé de la classification de Wagner constituent des déterminants critiques des issues défavorables du pied diabétique à l'Hôpital Central de Yaoundé.

DOI : <https://doi.org/10.64294/jsd.v3i4.189>

Introduction

The diabetic foot is one of the most severe and debilitating complications of diabetes mellitus, representing a major cause of morbidity, disability, and mortality worldwide. It is defined as infection, ulceration, or destruction of tissues of the foot associated with neuropathy and/or peripheral arterial disease. Beyond its clinical burden, the diabetic foot leads to prolonged hospitalizations, repeated surgical interventions, and high healthcare costs, thereby constituting a substantial socioeconomic challenge. Epidemiological data suggest that 15 to 25% of diabetic patients will develop a foot ulcer during their lifetime, and among them, 20% will ultimately require amputation of a lower limb segment [1]. In sub-Saharan Africa, the situation is even more alarming due to late diagnosis, limited access to specialized care, and poor availability of podiatric and vascular services. Consequently, rates of amputation remain disproportionately high, with significant excess mortality [2]. These factors contribute to amputation rates that are up to 10 times higher than those in high-income countries [3]. In Cameroon, although the diabetic foot is a frequent reason for hospitalization among diabetic patients [4], studies remain scarce and are mostly descriptive. Very few have specifically assessed the predictors of adverse outcomes such as amputation or death. Identifying these determinants is crucial to improving patient management, guiding preventive measures, and reducing the devastating impact of this condition.

Methods

We conducted a cross sectional with retrospective data collection study at the Central Hospital of Yaoundé from January 2019 to December 2021. All diabetic patients aged ≥ 18 years, hospitalized for diabetic foot complications with complete medical records within the 30 days following admission, were included. Diabetic patients with traumatic foot or swelling red leg and those with incomplete records as absence of biological and/or clinical characteristics and outcomes, were excluded. Data collected included sociodemographic, clinical, and biological characteristics, as well as the Wagner classification of diabetic foot lesions. The outcomes of interest were lower limb amputation (minor or major) and in-hospital mortality. Data analysis was performed using SPSS version 25. Qualitative variables were expressed as frequencies and compared using the Chi-square test. Quantitative variables were analyzed using the Student's t-test or the Mann-Whitney U test as appropriate. Multivariate logistic regression was applied to identify independent predictors of adverse outcomes. A p-value < 0.05 was considered statistically significant. Ethical approval was obtained from the institutional ethics committee of the Central Hospital of Yaoundé, and patient confidentiality was

strictly respected.

Results

A total of 329 diabetic foot patients were included in the study. The mean age of participants was 57.9 years (± 13.5). The majority of participants (66.0%) were diagnosed with type 2 diabetes (Table 1).

Table 1: demographic characteristics of patients admitted to the YCH diabetic unit.

Demographic characteristics	Frequency	Proportion (%)
Mean age (years)	57.9 $\pm$ 13.5	
BMI		
Normal	154	46.8
Overweight	126	38.3
Obese	49	14.9
Type of Diabetes		
DM Type II	217	66.0
DM Type I	112	34.0
Wagner Classification		
< 4	249	75
≥ 4	80	25

Most patients were on treatment; 237 (72%) were on at least one treatment modality, with 121 (36.8%) on insulin only, 63 (19.1%) on orals, and 53 (16.1%) on both (Table 2).

Table 2: Distribution of Patients According to Type of Antidiabetic Treatment

Type of Treatment	Frequency	Proportion (%)
Insulin only	121	36.8 %
Oral antidiabetic drugs only	63	19.1 %
Combined (Insulin + Oral)	53	16.1 %
Total on treatment	237	72 %
Untreated	92	28 %
Overall total	329	100 %

Among the comorbidities recorded, heart failure was the most prevalent (38.0%), followed by hypertension (33.7%) and chronic kidney disease (26.7%) (Table 3).

Table 3: population comorbidities

Comorbidities	Frequency	Proportion (%)
Hypertension	102	33.7
Heart failure	115	38.0
Chronic Kidney Disease	81	26.7
Osteoarthritis	1	0.3
Chronic Obstructive Pulmonary Disease	1	0.3
Liver cirrhosis	1	0.3
Tuberculosis	1	0.3

The study found that 90.4% of participants had HbA1c levels greater than 7%, and 25% of the

patients had a Wagner classification of four or higher (Table 1). In terms of outcomes, the study recorded 75 amputations (22.8%) and 77 deaths (23.4%) (Table 4).

Table 4: outcomes

Outcomes	Frequency	Proportion (%)
Amputation	75	22.8
Death	77	23.4
Unidentified outcomes	5	1.5

Multivariate logistic regression identified two significant factors associated with poor outcomes: dyslipidemia (aOR: 2.942) and a Wagner classification greater than or equal to four (aOR: 0.053) (Table 5 and Table 6).

Table 5: factors associated with poor outcome

Variable	Category	Alive n (%) N= 252	Dead n (%) N= 77	p-value
Lipid profile	Normal	125 (83.3)	25 (16.7)	0.008
	Dyslipidemia	127 (70.9)	52 (29.1)	
BMI	Normal	121 (78.6)	33 (21.4)	0.007
	Overweight	102 (81.0)	24 (19.0)	
	Obese	29 (59.2)	20 (40.8)	
Wagner class	< 4	116 (61.4)	73 (38.6)	<0.001
	≥ 4	136 (97.1)	4 (2.9)	
Amputation	Yes	74 (96.1)	3 (3.9)	<0.001
	No	178 (70.6)	74 (29.4)	

Table 6 : multivariate logistic regression

Variables	Alive n (%)	Dead n (%)	p-value	aOR	95% CI (lower-upper)
Lipid profil					
Normal	125 (83.3)	25 (16.7)	0.006	1	1.369 – 6.324
Dyslipidemia	127 (70.9)	52 (29.2)	--	2.942	--
Wagner Classification					
< 4	116 (61.4)	73 (38.6)	<0.001	1	0.018 - 0.155
≥ 4	136 (97.1)	4 (2.9)	--	0.053	--

Discussion

This study demonstrates that diabetic foot remains a major cause of disability and death in Cameroon, with unacceptably high rates of amputation (22.8%) and mortality (23.4%). These results underscore persistent challenges in early detection, glycemic control, and access to multidisciplinary care.

The mean age (57.9 years) and the predominance of type 2 diabetes are consistent with regional findings from Nigeria, Ghana, and Kenya [5–7]. This middle-aged predominance reflects the chronic evolution of diabetes in African populations, where diagnosis often occurs late. The male predominance (slightly higher though not statistically detailed) has been noted

elsewhere and may reflect lifestyle and occupational exposure to trauma, as well as poorer foot hygiene practices among men [8].

The high rates of heart failure (38%), hypertension (33.7%), and chronic kidney disease (26.7%) confirm the multifactorial burden of diabetes, which accelerates vascular damage and impairs wound healing [9,10]. The identification of dyslipidemia as a major determinant of adverse outcomes aligns with findings from Saudi Arabia and India [11,12]. Dyslipidemia contributes to micro- and macroangiopathy, reducing tissue perfusion and impairing leukocyte function. This mechanism increases infection susceptibility and delays ulcer healing. Therefore, early lipid screening and management—often overlooked in African diabetic clinics—should be systematically integrated into care.

The strong association between Wagner grade ≥ 4 and poor outcomes underscores the role of lesion severity as a prognostic marker. Higher Wagner grades represent deep necrotic or gangrenous lesions, often requiring surgical debridement or amputation. These findings parallel results from studies in Ghana and Iraq, which found advanced lesion grades as independent predictors of mortality [7,13].

Late presentation remains a key challenge: over 70% of African patients consult after more than two weeks of ulcer onset [14]. This delay allows infection progression and systemic involvement. Community-level awareness and early referral strategies are therefore critical.

The amputation rate (22.8%) and mortality rate (23.4%) are comparable to those reported in Ethiopia (25%) and Nigeria (21%) [15,16]. These outcomes far exceed those in high-income countries, where mortality rarely exceeds 2–5% due to robust wound-care systems and vascular reconstruction services [17].

The high mortality may also be related to systemic sepsis and uncontrolled hyperglycemia, conditions commonly observed in this cohort. Poor access to antibiotics, delayed surgical intervention, and limited intensive care capacity further worsen outcomes.

These findings highlight urgent priorities: early detection and referral systems for diabetic foot ulcers through primary care sensitization, the integration of lipid and cardiovascular risk management into diabetic foot protocols. Multidisciplinary care units involving endocrinologists, surgeons, podiatrists, and infectious disease specialists. Training of healthcare workers in wound care and early infection recognition. Community education campaigns emphasizing foot hygiene and early consultation.

Study Limitations

This study's retrospective nature limited

microbiological data and follow-up on long-term outcomes after discharge. Despite these limitations, the multicenter design and relatively large sample size provide valuable insights for national policy and hospital practice.

Conclusion

The present study concludes that the majority of diabetic foot patients admitted to Yaoundé Central Hospital have type 2 diabetes, poor glycemic control, and a high prevalence of comorbidities. The presence of dyslipidemia and a high-grade Wagner classification are critical factors associated with poor outcomes, emphasizing the need for enhanced management strategies to reduce morbidity and mortality.

Conflict of Interest: The authors declare that they have no competing interests.

Contribution of authors: Ekani Boukar: Conceived and designed the study, collected data, performed statistical analysis, and drafted the manuscript, Mokake: Assisted with study design, contributed to data interpretation, and critically revised the manuscript for important intellectual content, Mbelle and Wagnoun: Contributed to data collection, patient recruitment, and literature review, Ousmana, Nana, Savom, Ngwane: Contributed to literature review, Bang, Chichom, Essomba, Ngowe: Supervised the study, validated the methodology, guided the analysis, and provided final approval of the version to be published.

References

- Boulton AJ, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of diabetic foot disease. *Lancet*. 2005;366(9498):1719–24.
- Kahn SE, Cooper ME, Del Prato S. Pathophysiology and treatment of type 2 diabetes. *Lancet*. 2014;383(9922):1068–83.
- Alegbeleye BJ. Major limb amputations in Northwestern Cameroon. *Health Sci Dis*. 2020;21(2).
- Pisoh-Tangnyin C, Farikou I, Guifo ML, et al. Epidemiology of extremity amputations in Yaoundé, Cameroon. *Health Sci Dis*. 2010;11(4).
- Sarfo-Kantanka O, Sarfo FS, Kyei I, Agyemang C, Mbanya JC. *BMC Endocr Disord*. 2019;19(1):27.
- Obimbo M, Njogu S. Diabetes-related amputation in rural Kenya. *Atherosclerosis*. 2010;3:5–4.
- Marzoq A, Shiaa N, Zaboon R, et al. Outcome of diabetic foot ulcers in Basrah, Iraq. *Int J Diabetes Metab*. 2019;25(1–2):33–8.
- Al-Rubeaan K, et al. Diabetic foot complications and risk factors. *PLoS One*. 2015;10(5):e0124446.
- Feldman EL, Callaghan BC, Pop-Busui R, et al. Diabetic neuropathy. *Nat Rev Dis Primers*. 2019;5(1):41.
10. Aumiller WD, Dollahite HA. Pathogenesis and management of diabetic foot ulcers. *JAAPA*. 2015;28(5):28–34.
- Badri MM, Ghandourah NA, et al. Lower limb amputations among diabetics in Saudi Arabia. *J King Abdulaziz Univ Med Sci*. 2011;18(2):13–25.
- Ramanathan B, et al. Glycaemic status and diabetic foot outcomes in South India. *J Basic Clin Physiol Pharmacol*. 2022;33(2):155–62.
- Ekenze, Sebastian O., Obinna V. Ajuzieogu, and Benedict C. Nwomeh. "Challenges of management and outcome of neonatal surgery in Africa: a systematic review." *Pediatric surgery international* 32.3 (2016): 291-299.
- Goodman, Laura F., St-Louis, Etienne, Yousef, Yasmine, et al. The global initiative for children's surgery: optimal resources for improving care. *European Journal of Pediatric Surgery*, 2018, vol. 28, no 01, p. 051-059.
- Udoh, David O. et Adeyemo, Adebolajo A. Traumatic brain injuries in children: a hospital-based study in Nigeria. *African Journal of Paediatric Surgery*, 2013, vol. 10, no 2, p. 154-159..
- WHO. Global report on the prevention of surgical site infections. Geneva: WHO; 2018.
- Saxton, Anthony T., Poenaru, Dan, OZGEDIZ, Doruk, et al. Economic analysis of children's surgical care in low-and middle-income countries: a systematic review and analysis. *PloS one*, 2016, vol. 11, no 10, p. e0165480.



Radical retropubic prostatectomy by laparoscopic approach versus open surgery for localized prostate cancer. Techniques and results in two Cameroonian university teaching hospitals

Prostatectomie radicale retro pubienne par voie coelioscopique versus ciel ouvert pour cancer localisé de la prostate : techniques et resultats dans deux hôpitaux universitaire du Cameroun

Mekeme Mekeme JB^{1,5}, Makon Nwaha A^{2,5}, Tchivatang GG⁵, Fouda JC^{1,5}, Nzati⁴,
Yon Mekeme JM⁵, Fonji M⁵, Momha MMN⁵, Mbassi AA^{1,4}, Kemegni G¹, Ongolo Zogo P^{3,5},
Atangana P⁶, Owono Etoundi P⁵, Fru Angwafo III⁵

Original Article

1. Urology and Andrology Unit, Yaounde Central Hospital, Cameroon
2. Urology Unit Douala Laquintini Hospital, Douala, Cameroon
3. Medical Imagery Center, Yaounde Central Hospital
4. Higher Institute of Medical Technology, Nkolondom, Cameroon
5. Faculty of Medicine and Biomedical Sciences, University of Yaounde I
6. Faculty of Medicine and Pharmaceutical Sciences, University of Douala

Corresponding author : Mekeme Mekeme Junior Barthélémy, Urology and Andrology Unit, Yaounde Central Hospital, Tel : (+237) 677676240, juniormekeme@yahoo.fr

Keywords: Radical retropubic prostatectomy, prostate cancer, open surgery, laparoscopic surgery, Yaoundé, Douala

Mots-clés : Prostatectomie retro pubienne radicale, cancer de la prostate, chirurgie à ciel ouvert, chirurgie laparoscopique, Yaoundé, Douala

Date de soumission: 27/06/2025

Date d'acceptation: 29/11/2025

ABSTRACT

Introduction: Prostate cancer is a significant global health issue. The aim of our study was to analyse the short and medium-term outcomes of laparoscopic and open retropubic radical prostatectomy in two Cameroonian Teaching Hospitals.

Materials and methods: We conducted a retrospective and prospective analysis of all patients who underwent radical retropubic prostatectomy (RRP) and radical laparoscopic prostatectomy (RLP) in the Urology and Andrology Departments of the Yaoundé Central and Douala Laquintinie Hospitals over a 14-year period (2010-2024). We used validated self-administered questionnaires, including International Consultation Incontinence Questionnaire (ICIQ) and International Index of Erectile Function (IIEF 5) to assess perioperative data, disease progression and the quality of life.

Results: In total, 17 patients underwent radical prostatectomy, of which 10 patients had open PRR and 7 had a PRL. Their mean age was 66.1, with majority being from four regions of Cameroon. The period between diagnosis and surgery was 4.3 months. Participants who had open surgery had a higher blood transfusion rate (80% vs 28.7%; $p = 0.001$); longer catheter and drain removal time (13.1 vs. 11.7 days; 6.3 vs 4.2 days); and longer hospital stay (15.8 vs. 8.2 days). Mid-term complications were comparable in both groups, with erectile dysfunction representing 50% for PRR vs 42.8% for PRL ($p = 0.33$) and urinary incontinence was present in 10% for PRR vs 28.5% for PRL ($p = 0.1$).

Conclusion: Surgical treatment for localized prostate cancer provides adequate carcinologic control in our setting. Open surgery had more peri-operative complications, medium term outcomes showed no significant differences between both approaches.

RESUME

Introduction : Le cancer de la prostate est un problème de santé mondial. Notre but était d'analyser les résultats à court et moyen terme de la prostatectomie radicale retro pubienne par voie laparoscopique (PRL) et à ciel ouvert (PRR) dans deux hôpitaux Universitaire Camerounaise.

Matériels et méthodes : Etude rétrospective et analytique ayant inclus les patients ayant subi une PRR et PRL dans les départements d'urologie et d'andrologie des hôpitaux Central de Yaoundé et Laquintinie de Douala sur une période de 14 ans (2010-2024). Des questionnaires auto-administrés validés, ainsi que spécialisés étaient utilisés pour évaluer les données peropératoires, la progression de la maladie et la qualité de vie.

Résultats : Dix-sept patients avec un âge moyen de 66.1 provenant de quatre régions du Cameroun, ont subi une prostatectomie radicale, dont 10 ayant eu un PRR ouvert et 7 un PRL. La période entre le diagnostic et la chirurgie était de 4,3 mois. Le taux de transfusion sanguine était plus élevé chez ceux ayant eu un PRR (80% contre 28,7% ; $P = 0,001$) ; et un plus long délai d'ablation de sonde et drain (13,1 vs 11,7 jours ; 6,3 vs 4,2 jours) ; et plus long séjour hospitalier (15,8 vs 8,2 jours). Dans le moyen terme, les complications étaient superposables pour les deux groupes, avec une dysfonction érectile représentant 50% pour PRR vs 42,8% pour la PRL ($p = 0,33$) et l'incontinence urinaire était présente dans 10% pour PRR vs 28,5% pour le PRL ($P = 0,1$).

Conclusion : Le traitement chirurgical du CaP localisé permet un contrôle carcinologique suffisant dans notre contexte. L'abord en ciel ouvert a plus de complications per-opératoires. Néanmoins, a moyen terme, il n'y avait aucune différence significative entre les deux voies.

DOI : <https://doi.org/10.64294/jsd.v3i4.190>

Introduction

Cancer has emerged as a leading public health concern worldwide, impacting both developed and developing countries. According to the International Agency for Research on Cancer (IARC), 14.1 million new cases were diagnosed globally in 2014. Among men, prostate cancer is the most prevalent malignancy in those over 50 years of age, accounting for 1.1 million new cases annually and ranking as the second leading cause of cancer related mortality after lung cancer. In Cameroon, data from GLOBALCAN 2022 data, prostate cancer is third most common cancer, following breast and cervical cancer, with an annual incidence of 2,050 cases and a prevalence of 3,895 per 100,000 inhabitants [2]. Prostate disease is generally characterised by lower urinary tract symptoms [3], but the advent of markers of prostate disease has led to diagnosis of asymptomatic cancer via early biopsy and histologic analysis [4]. Mortality and morbidity from this cancer largely depends on its grade [5,6]. Radical surgery to obtain a cure is indicated for localised disease. Laparoscopic or open approaches both follow the same surgical steps as described in standard literature[7]

Our study objective was to analyze the short and medium-term outcomes of laparoscopic and open retropubic radical prostatectomy in two Cameroonian teaching hospitals.

Methodology

This was a retrospective and analytical cross-sectional study, conducted in two teaching hospitals in Cameroon: Yaoundé Central and Douala Laquintinie Hospitals, from October 1st 2023, to August 30th, 2024 (11 months) considering a Study period from 2010 – 2024. The study population comprised 132 patients diagnosed with localised prostate cancer who underwent either an open retropubic radical prostatectomy or a laparoscopic prostatectomy.

To carry out this study we obtained an ethical clearance of the faculty of medicine and biomedical sciences (FMBS), the research authorisation from the various places of study. The data has been processed in strict compliance with confidentiality.

We consulted the medical registers which permitted us to get in touch with our patients in order to obtain their consent and to fill out the informed questionnaires and then we had access to the patient files. The files not having exclusion criteria were retained. Using these files, we completed our information collection sheets.

Independent variables were socio demographic profile (age, sex, religion, marital status, ethnicity, profession, and residence), clinical parameters Prostate specific antigen (PSA) level in ng/ml, prostate volume in gram, Gleason score) and therapeutic factors (lymph node dissection, nerve-

sparing surgery).

Dependent variables included complications and follow-up findings like Blood transfusion, Urinary incontinence, Erectile dysfunction, ICIQ-UI score, International index of erectile dysfunction (IIEF-5) score, PSA level post-surgery and Additional treatment.

Data were thus collected and analysed using the R software.

The statistical analysis was conducted using R software version 4.4.3. Qualitative data were presented as frequency (n) and percentage (%) while quantitative data were expressed as mean and standard deviation (σ). The Chi-square test was used to compare proportions. The student's t-test was used to compare means. A significance threshold was set at $P = 0.05$.

Surgical technique

a. Surgical Instruments for open approach



Figure 1 : Instrument table (1. Deaver retractor, 2. retractor, 3. suction cannula, 4. Straight Allari forceps, 5. Cup, 6. Prostate crusher, 7. Curved Allari forceps, 8. Kocher forseps, 9. Jeal-Louis fort forceps, 10. Hryntschak retractor, 11. Metzenbaum scissors, 12. Dissecting forceps, 13. Scalpel blade N° 23 mounted on a handle, 14. Angled needle holder)



Figures 2 : (A) Laparoscopy column (monitor, insufflator, light source, Ligasure) (B) Laparoscopic instruments (a-Curved needle holder, b-Suction cannula, c-Straight needle holder, d-0-degree laparoscope, e-Ligasure f.Traumatic grasping forceps, g-Bipolar forceps, h-Atraumatic grasping forceps, p-Insufflation tubing, q-Camera cover, i-Curved scissors)

Results

a. Peri-operative data

The table below prevents the perioperative data from our study. Among patient who underwent open

radical prostatectomy, up to 80% required blood transfusion, compared to 28,6% in laparoscopic surgery group. Five out of ten patients received at least 1000cc of whole blood. In contrast with those who had laparoscopic surgery, where only two out of seven patients received 500cc of blood during the procedure.

Table I : perioperative data

Variables	n =17	Open Surgery	Laparos-copy	P-Value
Duration of Surgery (min)				
Average	230	220	245	0.2
Blood Transfusion				
	n (%)	n (%)	n (%)	0.001
> 2000 cc	2 (11.8%)	2 (100%)	0 (0.0%)	
1500 cc	2 (11.8%)	2 (11.8%)	0 (0.0%)	
1000 cc	2 (11.8%)	1 (50%)	1 (50.0%)	
500 cc	4 (23.5%)	3 (75.0%)	1 (25.0%)	
No transfusion	7 (41.2%)	2 (28.6%)	5 (71.0%)	
Post-operative fever				
	n (%)	n (%)	n (%)	0,1
Yes	4(23.5%)	3(75%)	1(25%)	
Catheter removal delay (days)				
Mean ± SD	12.2±3.3	13.1±4.2	11.7±2.1	0.6
Drain removal time (days)				
Mean ± SD	5.8±1.8	6.3±2.1	4.2±1.3	0.1
Hospital stay (days)				
Mean ± SD	12.5±4.9	15.8±3.7	8.29±2.7	<0.001

N= number, n= percentage

Among the ten patients, who underwent open radical prostatectomy, three developed post-operative fever, while only one of the seven patients in the laparoscopic group had fever. The mean duration for transurethral catheter removal was 12.2 ± 3.3 days, with earlier removal in the laparoscopic group (11.7 days) compared to the open surgery group (13.1 ± 4.2 days). The average hospital stay was 8.29 ± 2.7 days for laparoscopic surgery compared to 15.8 ± 3.7 days for open surgery.

b. Late Complications

The distribution of complications related to erectile dysfunction was homogeneous in both groups of our study (p value = 0.33). Severe erectile dysfunction (3 out of 17 patients in our study population) was more frequently observed in patients who underwent open prostatectomy. Only 3 out of 17 operated patients experienced moderate to severe urinary incontinence. Of these 3 patients, 2 had hypertension and the other had diabetes. They all presented with erectile dysfunction before surgery.

Table II : Late Complications

Variables	n = 17	Open Surgery	Laparos-copy	P-Value
Erectile Dysfunction (IIEF5 score)				
	n (%)	n (%)	n (%)	0.331
Normal: 21-25	4 (23.5%)	2 (50.0%)	2 (50.0%)	
Mild: 16-20	4 (23.5%)	2 (50.0%)	2 (50.0%)	
Moder: 11-15	4 (23.5%)	3 (75.0%)	1 (25.0%)	
Severe: 5-10	3 (17.6%)	3 (100%)	0 (0.0%)	
Non interpretable : 1-4	2 (11.8%)	0 (0.0%)	2 (100%)	
Urinary Incontinence (ICIQ-UI score)				
				0.152
Mild: 1-6	9 (75.0%)	6 (66.7%)	3 (33.3%)	
Moder: 7-12	1 (8.3%)	1 (100%)	0 (0.0%)	
Severe : >12	2 (16.7%)	0 (0.0%)	2 (100%)	

c. Results of Histopathologic analysis of specimen

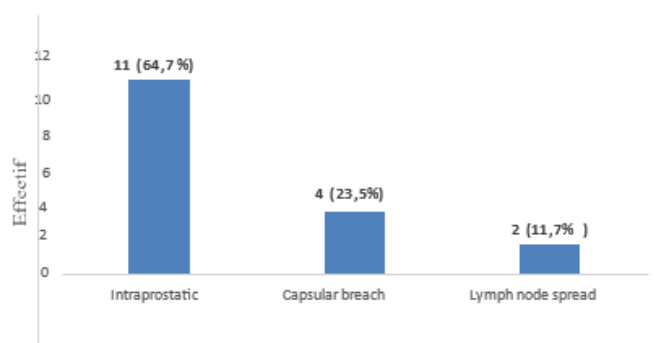


Figure 3: Histopathology results of the surgical specimen

The histopathologic analysis of the surgical specimens revealed 100% adenocarcinoma. Among the patients ,11(64.7%,) had tumors confined to the prostate. Capsular invasion was identified in 4 patients (23.5%), while lymph node involvement was noted in 2 patients (11.7%).

d. Complementary treatment after surgery

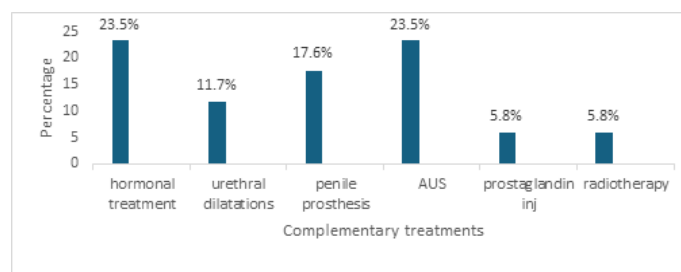
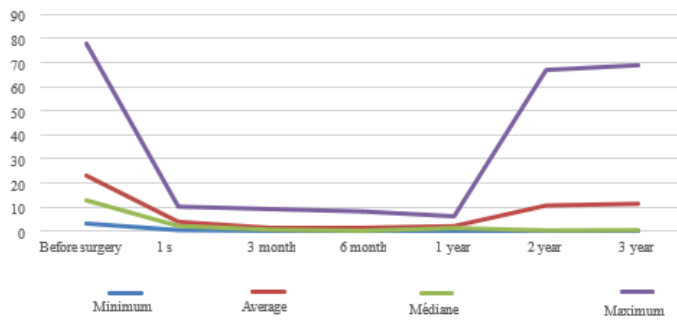


Figure 4: Complementary treatments after surgery

In our study, 12 patients received additional treatment after surgery. The most common modalities were hormone therapy, placement of an artificial urinary sphincter followed by penile prosthesis implantation. Two patients developed long-term anastomotic strictures, for which regular urethral dilation sessions were performed at specific intervals.

e. Total PSA fluctuations**Figure 5:** PSA Kinetics

This curve describes PSA kinetics before and after surgery. The nadir is reached from the 3rd month onward. We observe a significant decrease in PSA during the first year. However, we note two cases of PSA persistence and increase after the second year.

Table III: factors associated with the choice of surgery

Variables	aOR	CI 95%		P-value
		Minimum	Maximum	
Hospitalization duration	10-6	NA	Lower	1
Blood transfusion				1
1500cc	10-6	0	NA	
500cc	10-6	0	NA	
Not	1015	0	NA	

Although we obtained significant values regarding hospitalization duration ($p < 0.001$) and blood transfusion ($p = 0.001$), logistic regression analysis allowed us to determine values that were not statistically significant.

Discussion

Laparoscopy was used in 41.2% of cases, while open surgery was accounted for 58.8%. No cases required conversion from laparoscopy to open surgery. The choice of surgical approach depended on several factors, including the hospital's technical capabilities, the surgeon experience, and the cost of the procedure. In a 2014 study by Verdier et al. Titled Open versus Laparoscopic Radical Prostatectomy: Experience of a French Centre, 20.5% underwent RRP, while 79.5% had RLP [1]. In Verdier's study, patients who underwent open surgery did so between 2000 and 2003, while those who underwent laparoscopic surgery did so between 2003 and 2012. This highlights that with the advent of laparoscopy, developed countries quickly adapted, and open surgery became an abandoned option. In contrast, in developing countries, healthcare facilities are still in a process of learning and equipping themselves.

The duration of surgery was evenly distributed in our study ($P = 0.2$), with an overall average of 230 minutes. Laparoscopy generally took more time, with an average of 245 minutes compared to 220

minutes for open surgery. Surgical durations in the literature vary from 80 to 500 minutes in the study by Drouin et al. [9]. In the 2002 study on Localized Prostate Cancer: Treatment by Laparoscopic Radical Prostatectomy, analysing 841 cases by Vallancien et al., the average operative time was 2 hours and 30 minutes (ranging from 1 hour 30 minutes to 6 hours 30 minutes) [10].

The rate of blood transfusion was heterogeneously distributed in our study ($P = 0.001$). A total of 58.8% were transfused during or immediately after surgery. We had 28.6% of patients transfused in the RLP group versus 80% in the RRP group. These results are higher than those of Verdier et al., who reported a transfusion rate of 0.7% versus 2.9% for RLP and RRP, respectively [8]. Bastide et al., in a critical analysis of a comparative meta-analysis on morbidity, functional, and oncological outcomes of total prostatectomy based on the surgical approach, found an average transfusion rate of 51% for Open surgery and between 0% and 30% for laparoscopic surgery [11].

In our study, cases of fever were observed during hospitalization and were evenly distributed ($P = 0.1$). Among the 23.5% of patients who developed fever, 11.8% had malaria, likely due to multiple transfusions. Among the remaining 11.8%, no specific aetiology was identified as biological tests were normal, and the patients were on antibiotics during their hospital stay.

We found no statistically significant difference regarding catheter and drain removal ($P = 0.6$; $P = 0.1$), although the average removal time was earlier in LRP patients (11.7 vs. 13.1 days for the catheter and 4.2 vs. 6.3 days for the drain, respectively). Verdier et al. reached the same conclusion in their study comparing RRP and RLP. Patients who underwent RRP had longer hospital stays, with a heterogeneous distribution ($P = 0.001$) as RLP patients were discharged earlier (8.29 days vs. 15.8 days). Our data contrasts with the literature; Verdier et al. reported 6 days vs. 6.3 days for RLP and RRP, respectively [8].

The distribution of erectile dysfunction complications was homogeneous in both groups of our study ($P = 0.33$). Severe erectile dysfunction (17.6%) was more common in patients who underwent open prostatectomy. This could be explained by the fact that these three patients had comorbidities such as diabetes and hypertension. Additionally, in two of these three patients, the neurovascular bundles were not preserved during surgery.

In our study, there was no statistically significant difference ($P = 0.152$) in the occurrence of urinary incontinence after surgery. Only 17.6% of operated patients presented moderate to severe urinary incontinence.

Anastomotic strictures were evenly distributed ($P = 0.2$). Verdier et al. reported an incontinence rate of 37.3%, as their follow-up period was 12 months compared to our study, which had a three-year follow-up [7].

The rate of positive surgical margins in our study was 23.5%, which was moderate compared to figures reported in the literature, even considering their wide variability (11% to 41.5%) [8]. Other authors have found no significant difference in positive margins between RRP and RLP. Notably, Tewari et al, in their recent literature review, highlighted an equivalent margin rate between RRP and robot-assisted RLP, but a lower rate compared to conventional RLP [12]. Balla Bouzid reported a 6% rate in his thesis defended in Rabat in 2009. This lower rate compared to ours may be due to the fact that in his study, only 13% of patients were classified as high risk according to D'Amico. After radical prostatectomy, PSA levels normally become undetectable within 4 to 6 weeks. In our study, the nadir was reached at the third month. A total of 52.9% had undetectable PSA levels after three years of follow-up; 11.8% experienced biochemical recurrence within a year, for which salvage therapy was instituted, either through hormone therapy or radiotherapy. Our results are similar to those of Barret et al., who found that after treatment, the median PSA levels at 3, 6, and 12 months were 3.1, 2.9, and 2.7 ng/mL, respectively [13].

Conclusion

Surgical treatment for localized prostate cancer provides adequate control in our setting. While Peri-operative complications like blood transfusion, duration of transurethral catheter post op, length of hospital stay, erectile dysfunction and urinary incontinence are more frequent with open surgery. Medium term outcomes though show no significant differences between open and laparoscopic approaches.

Limitation

1. This study was carried out in one centre, but we wish to extend the study to other centres.
2. The sample size in this study was not large
3. Practice of laparoscopic surgery in our two study centres is still at an early phase

Ethical Clearance: Study was approved by institutional ethics committee.

Authors' Contribution: All the authors contributed to the research work. They read and agreed to the final version of the manuscript. Junior MEKEME and FOUDA conceived and designed research.

Junior MEKEME, GAYMA Guillaume and FOUDA, collected data.

Junior MEKEME and GAYMA Guillaume analysed data.

Junior MEKEME, GAYMA Guillaume and FOUDA interpreted results.

Junior MEKEME and GAYMA Guillaume drafted manuscript.

All co-authors edited and revised manuscript.

All authors read and approved final manuscript.

Conflicts of Interest: The authors declare no competing financial or personal interests

References:

1. Le Guévelou J, Peyrottes A, Meynard L, Barret E, Beauval JB, Brureau L, et al. Les grands principes des traitements du cancer de prostate localisé. *Médecine Nucl.* Elsevier; nov 2023;47:291-9.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *Glob Cancer Stat.* 4 févr 2022 ;2.
3. Fouda PJ, Mpay EM, Mekeme JM, Angwafor F, Sow M. La symptomatologie du bas appareil urinaire de l'homme à l'Hôpital Central de Yaoundé. A propos de 329 cas. *Health Sci Dis.* 2013;14(3).
4. Sabrina MIHOUB. Étude épidémiologique, anatomopathologique et immunohistochimique de l'adénocarcinome prostatique. [Algerie]: Université des Frères Mentouri Constantine Faculté des Sciences de la Nature et de la Vie; 2019.
5. F F Angwafo III, A Zaher, R Befidi-Mengue, A Wonkam, I Takougang. High-grade intra-epithelial neoplasia and prostate cancer in Dibombari, Cameroon. *prostate cancer and prostatic diseases.* Cameroon; 2003;34-8.
6. Angwafo FF, Atanga PN, Minkoulou E, Fouda PJ, Kim KS, Adams-Campbell L, et al. Factors Influencing Patient Survival in a Group of Men with Prostate Cancer in Yaoundé, Cameroon. *UroOncology.* juin 2003;3(1):7-11.
7. Smith JA, Howards SS, Preminger GM, et al. (eds). *Hinman's atlas of urologic surgery.* Fourth edition. Philadelphia: Elsevier, 2018.
8. Verdier E, Doré B, Fromont G, Pirès C, Lecoq B, Dezael J-C, et al. Prostatectomie radicale ouverte versus laparoscopique: expérience d'un centre français. *Prog En Urol.* Elsevier; 2014;24(3):173 9.
9. Drouin S-J, Vaessen C, Misrai V, Ferhi K, Bitker M-O, Chartier-Kastler E, et al. Résultats carcinologiques et fonctionnels de la prostatectomie totale laparoscopique robot-assistée. *Prog En Urol.* Elsevier ; 2009 ;19(3) :158 64.
10. Vallancien G, Guillonnet B, Cathelineau X, Baumert H, Doublet J-D. Cancer de la prostate localisé : traitement par prostatectomie radicale coelioscopique étude de 841 cas. *Bull Académie Natl Médecine.* Elsevier; 2002;186(1):117 24
11. Bastide C, Rozet F, Salomon L, Mongiat-Artus P, Beuzeboc P, Cormier L, et al. Analyse critique d'une méta-analyse comparative sur la morbidité, les résultats fonctionnels et carcinologiques de la prostatectomie totale en fonction de la voie d'abord utilisée. *Travail du comité de cancérologie de l'AFU.* *Prog En Urol.* 1 sept 2010 ;20(8) :547 52.
12. Tewari A, Sooriakumaran P, Bloch DA. Positive surgical margins and perioperative complication rates of primary surgical treatments for prostate cancer : a systematic review and meta analysis comparing retropubic, laparoscopic and robotic prostatectomy. *Eur Urol.* Elsevier ;2012 ;62(1) :1-
13. Barret E, Ahallal Y, Sanchez-Salas R, Galiano M, Cosset J-M, Validire P, et al. Morbidity of focal therapy in the treatment of localized prostate cancer. *Eur Urol.* avr 2013;63(4):618 22.



Surgical Management of Sciatica due to Lumbar Disc Herniation: Epidemiology, Quality of Life and Postoperative Outcome at Yaounde Military Hospital: A Retrospective Study

Prise en charge chirurgicale de la sciatique par une hernie discale lombaire : épidémiologie, qualité de vie et évolution postopératoire à l'Hôpital Militaire de Yaoundé – étude rétrospective

Djoubairou BO¹, Agbéko Komlan Doléagbéno A², Gbassara Koulagna B³, Figuim B⁴, Mfouapon-Ewane HB⁴, Motah M¹, Djientcheu VDP⁴

Original Article

1. Department of Surgery, Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Cameroon.
2. Neurosurgery Unit, CHU Sylvanus Olympio, Lomé, Togo.
3. Department of Surgery, Faculty of Health Sciences, University of Nairobi, Kenya. ORCID: 0009-0001-3545-7639
4. Department of Surgery, Faculty of Medicine and Biomedical Sciences, University of Yaounde, Cameroon.

Corresponding author: Ben Ousmanou Djoubairou, MD Neurosurgeon, Department of Surgery, Faculty of Medicine and Pharmaceutical Sciences, Douala, Littoral Region, Military Hospital of Yaoundé, Cameroon. Email: benjdoubairou@yahoo.fr | Phone: +237 672 997 544

Key words: Lumbar disc herniation; Discectomy; Functional outcome; Oswestry Disability Index; Return to work; Sub-Saharan Africa; Neurosurgery; Cameroon

Mots-clés: Hernie discale lombaire ; Discectomie ; Résultats fonctionnels ; Oswestry Disability Index ; Reprise du travail ; Afrique subsaharienne ; Neurochirurgie ; Cameroun

Date de soumission: 15/11/2025
Date d'acceptation: 01/12/2025

ABSTRACT

Background: lumbar disc herniation (LDH) is a major cause of sciatica and disability in young and middle-aged adults. This study evaluated the epidemiological features, clinical profile, and postoperative outcomes of patients operated on for LDH at the Yaounde Military Hospital.

Methods: a retrospective analytical study was carried out from January 2018 to December 2025 in the Neurosurgery Department. Twenty-five patients with complete postoperative follow-up were included. Sociodemographic, clinical, surgical, and postoperative parameters were analyzed using Stata® 17.0. Functional status was assessed with the Oswestry Disability Index (ODI), and return-to-work status at three months was recorded.

Results: the mean age was 43.6 ± 11.6 years, with a male predominance (68%). The most affected levels were L4–L5 (52%) and L5–S1 (40%). ODI scores improved markedly from a preoperative mean of 82.8% to 25% postoperatively. Complication rates were low (8%), consisting of one cerebrospinal fluid leak and one superficial wound infection. At three months, 92% of patients had resumed work, with 81.5% doing so through part-time reintegration. No socio-demographic or clinical variable was significantly associated with return-to-work outcomes ($p > 0.05$).

Conclusion: surgical discectomy for LDH at the Yaounde Military Hospital led to substantial functional improvement and a high early return-to-work rate. These findings support its effectiveness and safety, even in resource-limited settings, and underscore the importance of improving postoperative rehabilitation and expanding regional research.

RESUME

Introduction : La hernie discale lombaire est une cause majeure de sciatique et de handicap. Le but de cette étude était d'évaluer les caractéristiques épidémiologiques, cliniques et thérapeutiques des patients opérés d'une hernie discale lombaire à l'Hôpital Militaire de Yaoundé.

Méthodes : une étude analytique rétrospective a été conduite de janvier 2018 à décembre 2025 au sein du service de neurochirurgie. Vingt-cinq patients disposant d'un suivi postopératoire complet ont été inclus. Les paramètres socio-démographiques, cliniques, opératoires et postopératoires ont été analysés. Le statut fonctionnel a été évalué par l'Oswestry Disability Index, et la reprise du travail à trois mois a été enregistrée.

Résultats : L'âge moyen était de $43,6 \pm 11,6$ ans avec une prédominance masculine (68 %). Les niveaux L4–L5 (52 %) et L5–S1 (40 %) étaient les plus touchés. Le score ODI moyen est passé de 82,8 % en préopératoire à 25 % en postopératoire. Le taux de complications était faible (8 %). À trois mois, 92 % des patients avaient repris le travail. Aucune variable socio-démographique ou clinique n'était associée au statut de reprise du travail ($p > 0,05$).

Conclusion : la discectomie lombaire réalisée a permis une amélioration fonctionnelle notable et un taux élevé de reprise précoce du travail, confirmant son efficacité et sa sécurité.

DOI : <https://doi.org/10.64294/jsd.v3i4.191>

Introduction

Lumbosciatica due to a lumbar disc herniation (LDH) represents a frequent and significant challenge in neurosurgery. Indeed, displacement of the nucleus pulposus beyond the normal margins of the intervertebral space causes compression or irritation of a lumbar nerve root, leading to radicular pain that is often debilitating [1]. The incidence of lumbar radiculopathy related to an LDH is estimated in some series at 0.3 to 2.7 per 1,000 person-years for surgical definitions [1]. Prevalence points of symptomatic disc herniation have also been reported, ranging from 0.2% to 3% depending on the population studied [2]. The most frequently affected age group is typically between 30 and 50 years old, with a slight male predominance. Clinically, lumbosciatica due to herniated discs (HDL) manifests as lumbar pain radiating down the lower limb, often accompanied by signs of nerve root tension, sensory or motor disturbances, or even neurological deficits. This presentation has a significant functional impact (reduced mobility, inability to work, impaired quality of life) and represents a major socioeconomic cost [3].

Initial treatment is generally conservative (rest, anti-inflammatories, physiotherapy, activity modification). When this treatment fails—particularly in cases of persistent nerve root pain, neurological deficits, or significant functional impairment—surgery to decompress the disc (endoscopy, minimally invasive surgery, and conventional open surgery) becomes the preferred option [4]. Postoperative outcomes are generally satisfactory: for example, a cohort study of 1,195 patients who underwent discectomy showed significant improvements in pain scores, the Oswestry Disability Index, and the EuroQoL-5D at 3 and 12 months [5]. However, the outcome is not always excellent: a recent review indicates that approximately 25% to 33% of patients report unsatisfactory results after surgery [6]. Furthermore, specific data regarding quality of life, return to work, and postoperative complications vary depending on geographical context, surgical techniques, and institutional follow-up.

In Cameroon, and more specifically at the Yaounde Military Hospital, data concerning the surgical management of lumbosciatica related to a herniated disc remain limited. The epidemiological profile of patients undergoing surgery, the pre-operative impact on quality of life, functional outcomes, return to work, and post-surgical complications are not well documented in this context; moreover, patients' fear of surgery delays treatment and impacts post-operative outcomes. This gap makes it difficult to optimize care policies and compare results internationally.

It is within this context that the present study was conducted. It aims to describe the epidemiological and clinical profile of patients operated on for sciatica

secondary to a lumbar disc herniation at the Yaounde Military Hospital, as well as to assess quality of life before and after surgery, identify post-operative complications, and measure return to work at 3 months (partial return vs. full return). This data will enrich the local literature, provide useful guidelines for patient care, inform clinical decisions in this specific context, and, above all, demystify and popularize surgery.

Methodology:

This study was designed as a retrospective analytical investigation carried out in the Neurosurgery Department of the Yaounde Military Hospital over an eight-year period, from January 2018 to December 2025. It included all patients who underwent surgical management for lumbar disc herniation within the department. Data were obtained from individual medical files, operative registers, and postoperative follow-up consultations, allowing a comprehensive review of socio-demographic, clinical, operative, and recovery-related information.

The source population consisted of all patients operated on for lumbar disc herniation in the Neurosurgery Department during the study period. From this population, the study population included only those whose records were complete and who had adequate postoperative follow-up to assess functional outcomes, quality of life, and return-to-work status. These patients had full documentation of demographic characteristics, clinical presentation, radiological findings, operative details, and postoperative evolution.

Eligible participants were patients who underwent surgery for lumbar disc herniation between January 2018 and December 2025 and who had complete medical records containing all relevant preoperative, operative, and postoperative variables. Only patients with at least three months of postoperative follow-up, allowing assessment of return-to-work status, were included. Patients with incomplete or missing records, those operated on for other lumbar pathologies such as lumbar stenosis, tumors, or traumatic lesions, as well as patients lost to follow-up before the functional assessment, were excluded.

Sampling was exhaustive, incorporating all medical files that fulfilled the predefined eligibility criteria. A total of 25 patient records meeting these conditions were retained for analysis.

The variables analyzed included socio-demographic characteristics such as age, sex, year of surgery, and occupation; preoperative clinical variables including duration of symptoms, affected side, type of herniation, neurological deficits, and disc level; operative variables such as surgical technique and duration of surgery; and postoperative variables including length of hospital stay, complications, need for re-operation, pre- and postoperative pain scores,

and Oswestry Disability Index. Functional follow-up variables included return-to-work status, type of work schedule resumed, and time taken to return to work.

Data collection relied on a detailed review of individual patient records, the operating room logbook, and structured postoperative follow-up questionnaires completed during routine control visits. All extracted information was systematically recorded on a standardized data collection sheet established prior to the study.

Data entry and statistical analysis were performed using Stata version 17.0. Quantitative variables were summarized through measures of central tendency and dispersion, including means, standard deviations, and observed ranges, and were illustrated when necessary with histograms and box-plots. Qualitative variables were expressed as absolute frequencies and percentages and presented in tables or graphical representations. Analytical procedures included Pearson's chi-square test to assess associations between categorical variables, and Student's t-test to compare quantitative variables such as age between groups. The statistical significance threshold was fixed at $p < 0.05$.

The study adhered to the ethical standards outlined in the Declaration of Helsinki. Confidentiality and anonymity of all patients were strictly preserved throughout the research process. Authorization to access clinical records and conduct the study was obtained from the Head of the Neurosurgery Department and the Ethics Committee of the Yaounde Military Hospital.

Results:

A total of 25 patients who underwent surgery for lumbar disc herniation were included in this study between January 2018 and December 2025 (Table 1).

Table 1 : distribution of patients per year of surgery

Year of surgery	Number of patients	Proportion of patient (%)
2018	4	16
2019	1	4
2020	3	12
2021	2	8
2022	7	28
2023	6	24
2024	1	4
2024	1	4
Total	25	100

The year 2022 saw the highest number of procedures (28%), followed by 2023 (24%), reflecting a recent increase in surgical activity in the department. The mean age was 43.6 ± 11.6 years (range: 28–73 years).

The majority of patients were middle-aged adults, corresponding to the working population exposed to physical exertion. The series included 17 men (68%) and 8 women (32%), resulting in a male-to-female ratio of 2.1. Military personnel were the most frequent occupation (32.7%), followed by teachers (14.6%) and shopkeepers (14.1%). Public sector and security professions were thus predominant, potentially exposing patients to repeated physical strain. The average duration of symptoms before surgery was 14 months (range: 1–96 months). Nearly 76% of patients had experienced pain for less than 20 months. The right side was affected in 44% of cases, compared to 28% for the left side and 28% for bilateral involvement. Disc protrusions accounted for 96% of cases, compared to 4% of extrusions (Figure 1).

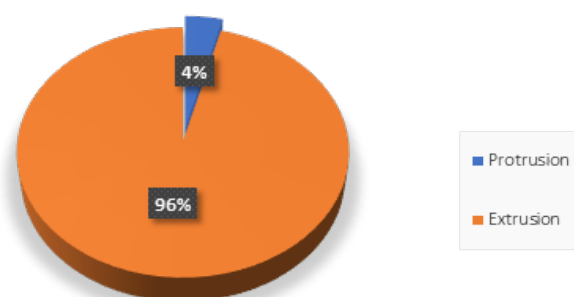


Figure 1 : type of herniated disc

No other forms of herniation (sequestered or migrated) were observed.

A sensory deficit was noted in 17 patients (68%), and a motor deficit in 8 patients (32%). The chi-square test between the type of herniation and the presence of a neurological deficit showed no significant difference ($\chi^2 = 0.49$; $p = 0.484$). The most frequently affected levels were L4–L5 (52%) and L5–S1 (40%) (Figure 2). Statistical analysis ($\chi^2 = 6.19$; $p = 0.103$) showed no significant correlation between disc level and the nature of the neurological deficit.

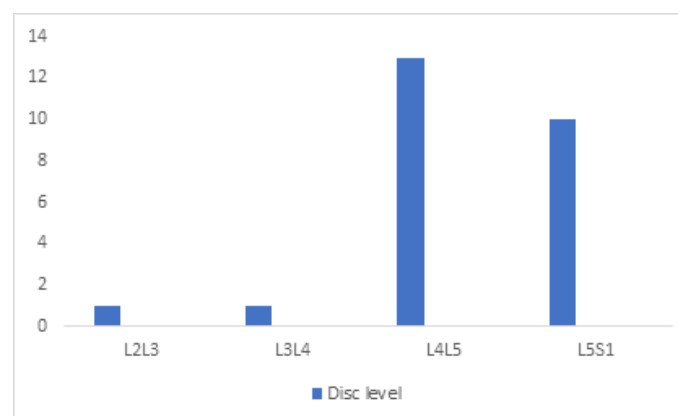


Figure 2: level of herniated disc

All patients underwent a conventional discectomy (Figure 3), the standard technique in the department.

The mean operative time was 57.8 minutes (range: 45–120 minutes). Three extreme values (90, 105, and 120 minutes) were observed in patients experiencing intra-operative technical difficulties.

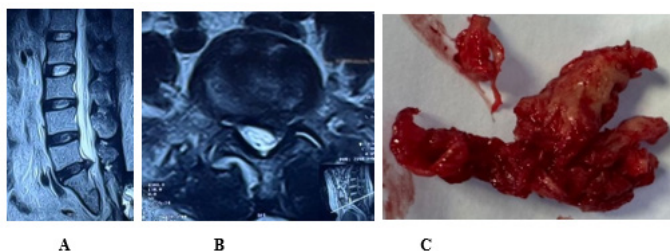


Figure 3: radiological and postoperative images of Herniated disc

- A. Sagittal T2 lumbar MRI, L5S1 herniated disc
- B. Axial T2 lumbar MRI, L5S1 left paramedial herniated disc with S1 nerve root compression
- C. Postoperative image of herniated disc resection

The length of hospital stay ranged from 4 to 10 days, with an average of 7 days.

The majority of patients had a hospital stay of less than 20 days. Minor complications were observed in 8% of patients: 1 CSF leak (4%), 1 wound infection (4%). No major neurological complications were recorded. A single re-operation (4%) was performed for symptomatic recurrence. The other 24 patients (96%) did not require any additional surgical procedures.

Pain assessment using a visual analog scale (VAS) showed an average reduction from 9/10 to 6/10 after surgery. This decrease indicates a clear improvement in functional comfort. The preoperative functional disability index (ODI) ranged from 60% to 100%, with an average value of 82.8%. The majority of patients therefore presented with severe to very severe disability before the procedure. Approximately 4% of patients had a score between 70% and 79%, while most (nearly 60%) were between 90% and 100% (Figure 4).

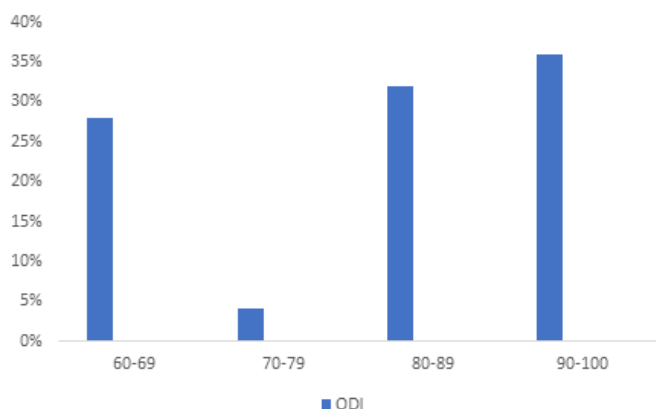


Figure 4: pre-operative ODI

After surgery, the postoperative ODI score ranged

from 18% to 97%, with an average of 25%. The majority of patients (approximately 60%) had a score between 18% and 37%, corresponding to minimal to moderate disability (Figure 5). Comparative analysis of box-plots (Figure 6) shows that the postoperative ODI functional score is significantly lower than the preoperative score, reflecting a significant improvement in quality of life and a marked reduction in lumbar pain after surgery.

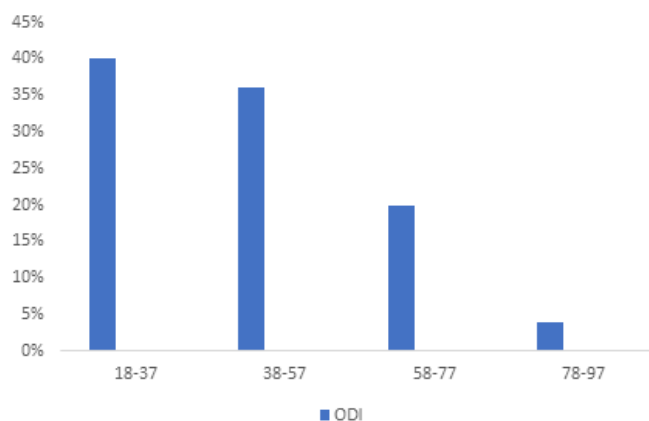


Figure 5: post-operative ODI

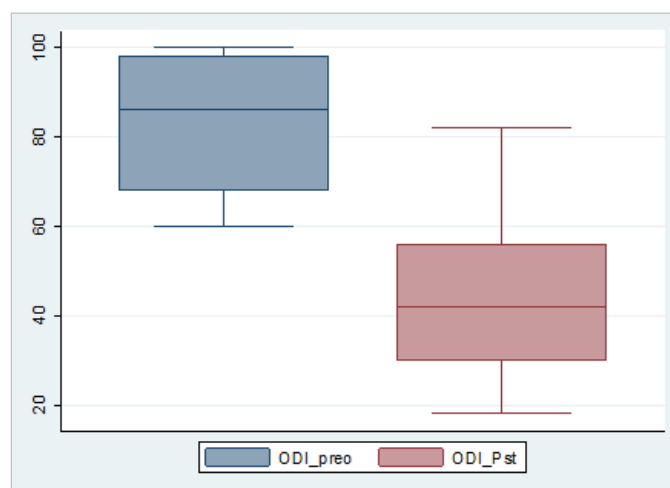


Figure 6 : comparison of ODIs

After three months of follow-up, 23 patients (92%) had returned to work, compared to 2 patients (8%) who had not yet returned (Table 5). No significant difference was observed between the sexes ($\chi^2 = 0.32$; $p = 0.569$). Patients who did not return to work were slightly older (mean age: 50 years) than those who did (43 years), but the difference was not significant ($t = 0.80$; $p = 0.43$). Among patients who returned to work, 81.5% worked part-time and 18.5% full-time. The mean time to return to work was 28 weeks (range: 0–104). The chi-square test between postoperative complications and return to work ($\chi^2 = 0.19$; $p = 0.910$) showed no significant association.

Discussion

The male predominance and average age of around 40 to 45 years are likely explained by the greater exposure of active men to physical exertion, postural constraints, or high-risk occupations such as those

of military personnel, teachers, or shopkeepers. The over-representation of military personnel (32.7%) may influence the patient profile, particularly due to their high level of physical activity and their expectations of a rapid return to work, which could also affect functional outcomes. Understanding this socio-professional profile allows for the adaptation of follow-up advice and post-operative rehabilitation programs according to the patient's profession. Clinicians should also anticipate that young and active patients often have higher expectations regarding rapid functional recovery and resumption of activity. In future studies, it would be relevant to examine the impact of occupational type (sedentary versus physical) on surgical outcomes and return-to-work time in this local context, and to consider multicenter studies in Central Africa to determine if this profile is generalizable.

Since the L4-L5 and L5-S1 segments are most subject to lumbar mechanical stress, it is logical that they are the most frequently affected. The average duration of symptoms, estimated at 14 months with extremes up to 96 months, could reflect a diagnostic delay because patients fear postoperative complications; a common misconception in the African context is that spinal surgery leads to postoperative motor deficits. This could also indicate a delay in care, as most of these patients did not have insurance or health coverage. Faster detection of symptoms and a reduction in the time between the onset of sciatica and surgery could thus improve postoperative outcomes. Surgeons must remain attentive to the presence of sensory or motor neurological deficits, as these can influence recovery. A prospective study would be useful to determine whether a shorter time to treatment promotes a better return-to-work rate and reduces postoperative deficits. Furthermore, a more detailed analysis of the type of herniation, whether protrusion or extrusion, could provide a better understanding of its influence on functional recovery.

The significant improvement observed, with the ODI score decreasing from approximately 82.8% to 25%, confirms that discectomy surgery is particularly effective in reducing disability related to herniated discs. These results are consistent with the literature, notably this study ([PubMed][7]) which showed an average improvement of 30% (ODI decreasing from 54.1% before to 23.8% after) and this other ([PubMed][8]) reporting a decrease from 67.2% to 15.7% at six weeks post-operatively ($p < 0.001$). This data helps patients better understand the expected benefits of surgery and set realistic recovery goals. The Oswestry Disability Index (ODI) is also a relevant tool for postoperative monitoring and planning appropriate rehabilitation. In the African context, it would be useful to collect ODI scores at different intervals (3, 6, and 12 months) to assess the stability of functional recovery and to examine postoperative

ODI thresholds associated with optimal return to work.

The high return-to-work rate of 92% at three months is particularly noteworthy in this context. For comparison, this cohort study ([PMC][9]) reported a rate of 95% at twelve months with a median time of approximately 78 days, while this meta-analysis ([BioMed Central][10]) estimated an overall rate of approximately 58% after spinal surgery, influenced by factors such as age, sex, and the nature of the work. The high rate observed in our series can be explained by the patient profile, predominantly young and active, as well as by the professional context of the armed forces, where the motivation to return to work is strong. These results underscore the importance of considering return to work as a key objective in surgical and postoperative planning. Rehabilitation programs should be specifically tailored to the patient's occupation, possibly including a partial return as an intermediate step toward a full return. Future studies could further analyze the determinants of the type of return to work (part-time or full-time) and the long-term maintenance of job stability, as well as assess the impact of workload, institutional support, and vocational rehabilitation programs on this return.

The low complication rate, estimated at 8%, likely reflects rigorous patient selection, the application of a standardized conventional discectomy technique, and adequate postoperative follow-up. The literature reports complication rates ranging from 2% to 6% in larger series, particularly for incidents such as cerebro-spinal fluid leaks or infections [11]. These results are encouraging and reassuring regarding the safety of the procedure, even in a resource-limited hospital setting. They also highlight the importance of a rigorous postoperative monitoring protocol and the prompt management of any potential complications. In the longer term, it would be relevant to document late complications such as recurrence or disc degeneration in this specific context, and to consider comparative studies between different surgical techniques, particularly between open discectomy and the endoscopic approach.

Study Limitations

This study has several limitations, notably the small sample size ($n = 25$), which reduces analytical power and the ability to generalize the results. Its retrospective nature also exposes it to selection and follow-up biases. The limited medium-term follow-up, with an assessment of return to work at only three months, does not allow for an evaluation of long-term outcomes. Furthermore, the lack of psychological or socioeconomic assessment of the patients is a significant limitation, as these factors can influence functional recovery and return to work. Finally, the specific military context, characterized by a strong

motivation to return to work, limits the generalizability of the findings to the civilian population.

Conclusion

This study highlights that lumbar disc herniation is a major cause of sciatica in young, active adults, particularly in the military context where physical demands are high. Surgery, primarily discectomy, has led to a significant improvement in quality of life and a notable reduction in functional disability, confirming its effectiveness in treating forms resistant to medical treatment. The low complication rate observed and the rapid return to work demonstrate the safety and reliability of this approach in our setting. However, persistent misconceptions and fear of surgery often delay treatment, underscoring the need to intensify patient awareness and education. It is therefore recommended to promote better public and healthcare staff information on the benefits of spinal surgery, to improve postoperative rehabilitation programs, to encourage multicenter research on long-term outcomes and to facilitate financial access to surgery in order to ensure more equitable and effective care for patients suffering from sciatica related to a lumbar disc herniation.

Declarations

Acknowledgements: The authors express their gratitude to the staff of the Neurosurgery Department and the administration of the Yaounde Military Hospital for their logistical support and collaboration during the conduct of this study.

Authors' Contributions

Ben Ousmanou Djoubairou conceptualized the study, supervised data collection and analysis, and reviewed the manuscript. Achille Agbéko Komlan Doléagbénou contributed to the interpretation of the results and the writing of the discussion. Boris Gbassara Koulagna was responsible for the initial drafting of the manuscript and formatting according to the guidelines of the Journal of science and Diseases. Bello Figuim participated in the collection of clinical data and the postoperative follow-up of patients. Hervé Mfouapon contributed to the management of medical records and data entry. Mathieu Motah and Vincent De Paul Djientcheu supervised the entire project, critically reviewed the manuscript, and approved the final version. All authors have read and approved the final version of the manuscript.

Funding: No external funding was received for this study.

Availability of Data and Materials: The data used and analyzed in this study are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate: This study was approved by the Ethics Committee of the Yaounde Military Hospital. Informed consent was obtained from the included patients before their participation.

Consent for Publication: All authors have given their consent for the publication of this manuscript. The patients consented to the anonymous use of their data for research and scientific publication.

Competing Interests: The authors declare that they have no conflicts of interest related to this study.

References

- Hincapié CA, Kroismayr D, Hofstetter L, Kurmann A, Cancelliere C, Rampersaud YR, Boyle E, Tomlinson GA, Jadad AR, Hartvigsen J, Côté P, Cassidy JD. Incidence of and risk factors for lumbar disc herniation with radiculopathy in adults: a systematic review. *Eur Spine J*. 2025; 34(1):263-294. doi:[10.1007/s00586-024-08528-8](https://link.springer.com/article/10.1007/s00586-024-08528-8)
- Al Barbarawi MM, Audat ZM, Khriesat WM, Qudsieh HM, Qudsieh RM. Surgical management of lumbar disc herniation: experience from 300 cases. **Neurosciences (Riyadh)*. 2023;28(3):159-165. doi:[10.17712/nsj.2023.3.20220092](https://nsj.org.sa/content/28/3/159)
- Abou-Zeid AH. Lumbar discectomy: outcome and predictors of postoperative recovery. *Egypt J Neurol Psychiatr Neurosurg*. 2019; 55:74. PMID: [31713029](https://pubmed.ncbi.nlm.nih.gov/31713029/)
- Al-Mosawi AJ. Surgical outcome of lumbar disc herniation: an experience from a teaching hospital. **Med Princ Pract*. 2015;24(3):285-290. Available from: https://applications.emro.who.int/imemrf/Med_Princ_Pract/Med_Princ_Pract_2015_24_3_285_290.pdf
- Azimi P, Mohammadi HR, Azhari S, Montazeri A. Lumbar microdiscectomy versus open discectomy: a randomized controlled trial. *Asian Spine J*. 2018;12(1):1-8. doi:[10.4184/asj.2018.12.1.1](https://pubmed.ncbi.nlm.nih.gov/29454134/)
- Yoon JW, Goh TS, Lee JS, Park SY. Comparison of long-term outcomes between microdiscectomy and endoscopic discectomy for lumbar disc herniation. *Int J Spine Surg*. 2024;18(6):637-645. doi:[10.14444/8624](https://www.ijssurgery.com/content/18/6/637)
- Atlas SJ, Keller RB, Wu YA, Deyo RA, Singer DE. Long-term outcomes of surgical and nonsurgical management of sciatica secondary to a lumbar disc herniation: 10-year results from the Maine Lumbar Spine Study. *Spine (Phila Pa 1976)*. 2001;26(10):1179-1187. PMID: [11389409](https://pubmed.ncbi.nlm.nih.gov/12807041/)
- Bailey CS, Rasoulinejad P, Taylor D, Sequeira K, Miller T, Watson J, et al. Surgery versus conservative care for persistent sciatica lasting 4 to 12 months. *N Engl J Med*. 2020;382(12):1093-1102. doi:[10.1056/NEJMoa1912658](https://pubmed.ncbi.nlm.nih.gov/30508966/)
- Shrestha R, Khanal S, Shrestha D, Sapkota R, Acharya B, Adhikari R. Outcome of lumbar disc herniation surgery: a single-center retrospective study. *Asian J Neurosurg*. 2021;16(3):497-502. doi:[10.4103/ajns.AJNS_297_20](https://pmc.ncbi.nlm.nih.gov/articles/PMC8635580/)
- Zhu Y, Wang L, Zhang Q, Chen Y, Li Y, Xu G, et al. Comparison of early and late surgical intervention in patients with lumbar disc herniation: a propensity score analysis. *J Orthop Surg Res*. 2024;19(1):228. doi:[10.1186/s13018-024-04988-2](https://josr-online.biomedcentral.com/articles/10.1186/s13018-024-04988-2)
- Kamper SJ, Ostelo RWJG, Rubinstein SM, Nellensteijn JM, Peul WC, Arts MP, et al. Minimally invasive surgery for lumbar disc herniation: a systematic review and meta-analysis. **J Spine Surg**. 2014;1(1):44-57. Available from: https://jss.amegroups.org/article/view/3919/4578



Aspects épidémiologiques, diagnostiques et thérapeutiques des cellulites cervico-faciales dans le service de Stomatologie et Chirurgie maxillo-faciale du Centre Hospitalier Universitaire Yalgado Ouédraogo

Epidemiological, diagnostic, and therapeutic aspects of cervicofacial cellulitis in the Department of Stomatology and Maxillofacial Surgery at the Yalgado Ouedraogo University Hospital Center

Bazame CBT¹, Idani M², Coulibaly A³, Congo RJ⁴, Kabore Wendpouloumdé AD², Millogo M^{2,5}, Konsem T²

Article Original

1. Service de Stomatologie et Chirurgie maxillo-faciale du CHU de Pala
2. Service de Stomatologie et Chirurgie maxillo-faciale du CHU Yalgado Ouédraogo
3. Service de Stomatologie et Chirurgie maxillo-faciale du CHU Régional de Ouahigouya
4. Service de Stomatologie et Chirurgie maxillo-faciale du CHU de Tengandogo

Auteur correspondant : Bazame Clovis Bienfaisance T, Chirurgien maxillo-facial et Stomatologiste, Praticien hospitalier au CHU de Pala; 01 BP 676 Bobo-Dioulasso 01; Tél : (00226) 70286297 ; Mail : bazameclovis@gmail.com

Mots clés : cellulite cervico-faciale ; origine dentaire ; antibiothérapie ; drainage chirurgical ; anesthésie locale

Keywords: cervico-facial cellulitis; dental origin; antibiotic therapy; surgical drainage; local anesthesia

Date de soumission: 13/10/2025

Date d'acceptation: 09/12/2025

RESUME

Introduction : L'objectif de ce travail est de rapporter les aspects épidémiologiques, diagnostiques et thérapeutiques des cellulites cervico-faciales dans le service de Stomatologie et Chirurgie cervico-faciale du CHU Yalgado Ouédraogo.

Matériels et méthode : Il s'est agi d'une étude transversale, descriptive, à collecte rétrospective sur une année dans le service de Stomatologie et Chirurgie maxillo-faciale du CHU Yalgado Ouédraogo, portant sur 127 patients.

Résultats : L'âge moyen des patients était de $42,1 \pm 17,13$ ans. Le sexe-ratio était de 2,34. Le niveau socio-économique était jugé précaire chez 75,60% des patients. Une automédication par AINS ou un recours à l'indigénat a été entrepris par 54 (42,51%) patients. Le délai moyen de consultation était de 10,8 jours. La tuméfaction inflammatoire cervicale et/ou faciale était constante. Il s'est agi d'une cellulite cervico-faciale diffusée chez 67 (52,8%) des patients. Les cellulites étaient d'origine odontogène dans la quasi-totalité des cas (96%). Sur le plan thérapeutique, le traitement médical était fait d'une double antibiothérapie par Amoxicilline-Acide clavulanique + Métronidazole et d'une corticothérapie. Le drainage chirurgical des collections suppurées était souvent réalisé sous anesthésie locale. L'avulsion dentaire était réalisée à chaque fois que la porte d'entrée de l'infection était dentaire. L'évolution était favorable chez 95,27% des patients.

Conclusion : Pour une affection éminemment évitable, l'accent doit être mis sur la prévention qui passe par la promotion de la santé bucco-dentaire et la mise en œuvre d'une couverture sanitaire pour tous.

ABSTRACT

Introduction: The aim of this study is to report on the epidemiological, diagnostic, and therapeutic aspects of cervicofacial cellulitis in the Stomatology and Cervicofacial Surgery Department at Yalgado Ouédraogo University Hospital.

Materials and methods: This was a cross-sectional, descriptive, retrospective study conducted over one year in the Stomatology and Maxillofacial Surgery Department of the Yalgado Ouédraogo University Hospital, involving 127 patients.

Results: The average age of the patients was 42.1 years $\pm$ 17.13 years. The sex ratio was 2.34. The socioeconomic status was considered precarious in 75.60% of patients. Self-medication with NSAIDs or recourse to indigenous remedies was undertaken by 54 (42.51%) patients. The average time to consultation was 10.8 days. Cervical and/or facial inflammatory swelling was constant. Diffuse cervico-facial cellulitis was present in 67 (52.8%) patients. Cellulitis was odontogenic in origin in almost all cases (96%). In terms of treatment, medical treatment consisted of dual antibiotic therapy with amoxicillin-clavulanic acid + metronidazole and corticosteroid therapy. Surgical drainage of suppurative collections was often performed under local anesthesia. Tooth extraction was performed whenever the infection originated in the teeth. The outcome was favorable in 95.27% of patients.

Conclusion: For a highly preventable condition, the emphasis must be placed on prevention through the promotion of oral health and the implementation of universal health coverage.

DOI : <https://doi.org/10.64294/jsd.v3i4.192>

Introduction

Les cellulites cervico-faciales sont des infections des loges cellulo-graisseuses de la face et/ ou du cou, se développant à partir d'une infection banale, le plus souvent dentaire [1-3]. Ce sont des infections polymicrobiennes associant des germes aérobies et anaérobies dont les potentialités extensives peuvent être graves et engager le pronostic vital [4-6]. Si ces affections sont devenues rares dans les pays développés depuis l'avènement de l'antibiothérapie, elles demeurent une préoccupation majeure en milieu hospitalier africain [7-9]. En effet, la précarité du niveau socio-économique des populations des pays en développement conduit à des retards à la consultation, au recours à la médecine traditionnelle ou encore à une automédication par AINS, fait ainsi diagnostiquer ces infections à des stades sévères, nécrosantes, mettant en jeu le pronostic vital [6,8,10]. La guérison se faisant alors parfois au prix de séquelles fonctionnelles et/ ou esthétiques lourdes.

Les cellulites cervico-faciales constituent une urgence médico-chirurgicale. Leur prise en charge est pluridisciplinaire et associe le chirurgien maxillo-facial, ORL, le médecin réanimateur-anesthésiste, le biologiste médical et le chirurgien-dentiste [11-13]. Ce traitement comprend trois volets : un traitement médical fait de mesures de réanimation et d'une antibiothérapie adéquate, un traitement chirurgical permettant le drainage des collections suppurées, la résection des tissus nécrotiques et la reconstruction des pertes de substances séquellaires, et un traitement étiologique visant à éliminer le foyer infectieux [1-5, 11,12].

L'objectif de ce travail est de rapporter les aspects épidémiologiques, diagnostiques et thérapeutiques des cellulites cervico-faciales dans le service de Stomatologie et Chirurgie cervico-faciale du Centre Hospitalier Universitaire Yalgado Ouédraogo.

Matériels et Méthodes

Il s'est agi d'une étude transversale, descriptive et analytique, à collecte rétrospective s'étalant du 01 Janvier au 31 Décembre 2022 dans le service de Stomatologie et Chirurgie maxillo-faciale du centre hospitalier universitaire Yalgado Ouédraogo. Cette étude a inclus tous les patients pris en charge pour cellulite cervico-faciale, dont les dossiers cliniques étaient exploitables. Les variables étudiées étaient d'ordre épidémiologique (âge, sexe et niveau socio-économique des patients), diagnostiques (délai de consultation, facteurs favorisants, formes anatomocliniques, bilans biologiques et radiologiques) et thérapeutiques (modalités thérapeutiques et évolutives). Les dossiers cliniques des patients et les registres de compte rendu opératoire étaient les sources des différentes variables d'intérêt. Les données recensées ont été recueillies à l'aide d'une fiche de collecte établie à cet effet. L'analyse des

données a été faite à l'aide du logiciel Epi-info dans sa version 7.2.2.6.

Résultats

Durant l'année de cette étude, 143 cas de cellulites cervico-faciales ont été enregistré, soit 7,33% de l'ensemble des patients admis en consultation stomatologique. L'incomplétude de certains dossiers a conduit à l'exclusion de 16 cas. L'échantillon de notre étude était donc constitué de 127 patients. La figure 1 donne le flux des patients répertoriés dans le service de Stomatologie et Chirurgie maxillo-faciale du CHU Yalgado Ouédraogo durant l'année 2022. L'âge des patients variait de 16 à 80 ans, avec une moyenne d'âge de 42,1 ans $\pm$ 17,13 ans. Le sex-ratio était de 2,34, soit 70% d'hommes (N=89) et 30% de femmes (N=38). Le niveau socio-économique était jugé défavorable chez 75,60% des patients. Une automédication a été entreprise par 42,51% des patients (N=54) au début de la symptomatologie. Il s'est agi de la prise d'anti-inflammatoire en monothérapie chez 44 patients ou d'un recours à des produits indigènes chez 11 patients.

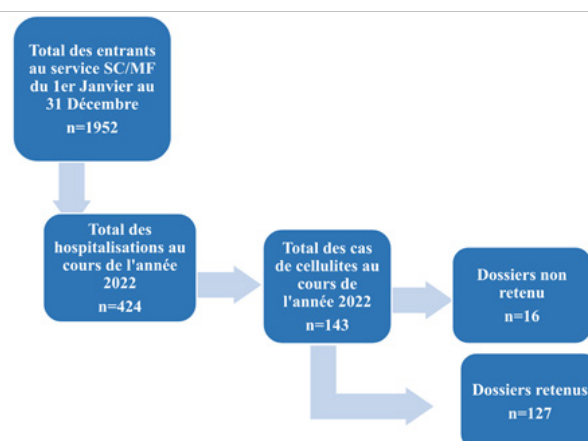


Figure 1 : diagramme de flux des patients admis en consultation stomatologique durant la période de l'étude

Sur le plan diagnostique, le délai de consultation variait de 4 à 29 jours avec un délai moyen de 10,8 jours $\pm$ 4,7 jours. La tuméfaction cervicale et/ ou faciale inflammatoire était la présentation clinique commune chez 96,10% des patients (N=122). Le tableau I fait la répartition des patients selon leur motif de consultation, plusieurs signes pouvant être associés chez le même patient. L'état général était bon chez 56,70% des patients (N=72) tandis que 31,50% des patients (N=50) avait un état général altéré à leur admission. L'hygiène bucco-dentaire était médiocre chez 95,30% des patients (N=121) avec issue de pus au collet d'une dent carieuse chez 48% d'entre eux (N=60). Pour ce qui est des formes cliniques, 52,8% des patients (N=67) présentaient une cellulite cervico-faciale diffusée tandis qu'il s'est agi d'une cellulite cervico-faciale circonscrite chez 40,90% (N=52) et d'une cellulite diffuse chez

6,3% patients (N=8). Dans cette étude, les cellulites cervico-faciales étaient principalement secondaires à une infection dentaire chez 96% patients (N=122). Un bilan radiologique était systématique réalisé. La radiographie panoramique dentaire, prescrite chez l'ensemble des patients, a retrouvé une carie dentaire chez 96% patients (N=122) et une fracture mandibulaire chez 3 patients. La tomodensitométrie, réalisée chez 3 patients, avait mis en évidence une médiastinite chez 2 patients et une cellulite cervico-faciale avec extension orbitaire et atteinte du nerf optique chez 1 patient. Une étude cyto bactériologique de pus a pu être réalisée chez 20 patients. Cette étude était négative chez 16 patients, et a isolé *Staphylococcus sp* chez 2 patients, *staphylococcus aureus* chez 1 patient et *streptococcus epidermidis* chez 1 patient.

Tableau I : répartition des patients selon le motif de consultation

Motif de consultation	Effectif (n)	Fréquence (%)
Tuméfaction cervicale et/ou faciale	122	96,1
Dysphagie	31	24,4
Douleurs dentaires	22	17,3
Dysphonie	17	13,4
Nécrose étendue	3	2,4
Fistule endobuccale	2	1,6
Dyspnée	1	0,8

Sur le plan thérapeutique, le traitement médical des cellulites cervico-faciales a consisté à la mise en route systématique d'une bi-antibiothérapie probabiliste, faite d'amoxicilline + acide clavulanique associée au métronidazole, chez l'ensemble des patients ; une tri-antibiothérapie probabiliste associant de la gentamycine était instituée chez 2 patients. Une corticothérapie était prescrite chez 124 patients et un traitement antalgique, essentiellement de palier I, était institué chez tous les patients. Huit (08) patients ont bénéficié d'une réanimation faite d'oxygénothérapie et d'une correction de troubles électrolytiques. Le traitement chirurgical a consisté en une incision drainage des collections suppurées chez 97,6% des patients (N=124) et à une nécrosectomie chez 2,4% des patients (N=3). Ce traitement chirurgical était réalisé sous anesthésie locale chez 96,9% des patients (N=123) et sous anesthésie générale chez 3,1% patients (N=4). Les complications médiastinales et oculaires ont été pris en charge en collaboration avec d'autres spécialités. Quant au traitement étiologique, il a consisté en une extraction dentaire chez 96% des patients (N=122) et à la prise en charge d'une fracture mandibulaire chez 3 patients. Les cas de parodontopathies ont bénéficié d'une mise en état de la cavité buccale par l'équipe de chirurgie dentaire.

Dans cette série, 95,27% des patients (N=121) ont évolué favorablement. Toutefois, une mortalité

de 4,72% a été rapportée. Le délai moyen d'hospitalisation était de 9 jours $\pm$ 3,9 jours avec des extrêmes de 1 et 29 jours.



Figure 2 : patient de 37 ans présentant une cellulite cervico-faciale et thoracique d'origine dentaire avec nécrose étendue, laissant soudre du pus (A et B) qui a bénéficié d'un drainage + nécrosectomie au lit sous anesthésie locale (C).

Discussion

Les cellulites cervico-faciales demeurent une entité assez courante de la pathologie infectieuse maxillo-faciale en milieu hospitalier africain [1,2,11,14,15]. L'incidence annuelle rapportée dans cette étude sous-estime fortement la prévalence de ces infections dans nos services de Stomatologie et Chirurgie maxillo-faciale. En effet, outre les patients exclus pour incomplétude des dossiers cliniques, il existe dans la ville de Ouagadougou deux autres CHU disposant de chirurgiens maxillo-faciaux qui reçoivent également des cas d'infections de la face. Cependant, la prévalence rapportée dans cette série corrobore celle notée par plusieurs auteurs africains [2,5,11,14,16]. La littérature africaine décrit les cellulites cervico-faciales comme étant l'apanage du sujet jeune, de sexe masculin, vivant dans des conditions socio-économiques précaires [1,2,5,10]. Les résultats de cette série sont en concordance avec cette observation.

Les cellulites cervico-faciales peuvent bien survenir chez un sujet jeune en bonne santé apparente. Toutefois, certains facteurs sont bien connus pour favoriser la survenue des cellulites cervico-faciales. Il s'agit entre autres des terrains fragilisés sur le plan immunitaire (diabète, immunodépression au VIH, traitement immunosuppresseur, HTA), la mauvaise hygiène bucco-dentaire, la prise d'AINS en monothérapie pour des infections bucco-dentaires banales [1,5,17,18]. Le recours aux produits indigènes est une particularité en milieu hospitalier africain [8,11]. Tout comme la plupart des auteurs

africains, cette étude confirme l'incrimination de ces facteurs dans le développement des cellulites cervico-faciales. La précarité des patients rapportée dans toutes les séries africaines justifierait les initiatives d'automédication constatée dans cette étude. Les anti-inflammatoires en raison de leur propriété antalgique masquent la sévérité de l'infection et favorisent la survenue de l'infection en inhibant l'immunité [12]. Ainsi, l'infection qui était jusque-là circonscrite par la réaction inflammatoire peut alors diffuser. La prise de ces AINS était dans certains cas le fait de praticiens non avertis. Aussi, les substances utilisées dans la pharmacopée traditionnelle sont mal connues. En plus de retarder la consultation spécialisée, elles auraient un effet toxique ou caustique qui pourrait favoriser la diffusion de l'infection et la nécrose cutanée [2,12].

Les retards à la consultation sont classiques dans les séries africaines [1,5,11,14,19]. Dans cette série, les patients ont consulté entre 4 et 29 jours après le début supposé de leur maladie, avec un délai moyen de 10,8 jours $\pm$ 4,7 jours. Ce constat est le reflet de l'itinéraire thérapeutique des patients. Le manque d'information de certains praticiens dans les centres de santé primaires et secondaires, le recours à l'automédication et aux traitements traditionnels d'une part, et l'inaccessibilité financière des soins de santé d'autre part, sont à prendre en considération.

Le diagnostic d'une cellulite cervico-faciale est clinique, basé sur la coexistence de signes généraux d'importance variable et de signes physiques cervico-faciaux. La tuméfaction cervico-faciale inflammatoire est quasi-constante. Cette tuméfaction était le motif de consultation le plus courant dans cette série. A elle seule, elle est fortement évocatrice d'une cellulite cervico-faciale. L'association d'un trismus et d'une odynophagie est habituelle [6,8,11]. Pour ce qui est des formes cliniques, la prédominance des cellulites cervico-faciales diffusées est la résultante du retard de prise en charge rapportée dans cette étude.

Dans la plupart des séries publiées, l'infection dentaire est le principal facteur déterminant la survenue de la cellulite cervico-faciale [1,2,4,6,8,11,19]. Cette donnée est retrouvée dans cette étude.

Pour ce qui est du bilan radiologique dans les cellulites cervico-faciales, la radiographie panoramique dentaire s'impose en cas de cellulite odontogène. Elle permet d'objectiver les foyers cariés, les zones d'ostéolyses péri-apicales et les granulomes ou kystes péri-apicaux [1,9,20]. En raison de la prédominance de la porte d'entrée dentaire de l'infection cervico-faciale dans cette étude, cet examen a été largement prescrit pour l'ensemble des patients. La tomodensitométrie, grâce à son excellente résolution en densité tissulaire et osseuse permet de préciser la nature inflammatoire d'une tuméfaction cervicale, d'évaluer son extension et de

rechercher une collection dont la mise en évidence imposerait le drainage chirurgical [12,13,20]. Cette exploration est d'un apport considérable en cas de suspicion d'extension médiastinale dont l'expression clinique initiale peut être parfois frustrante [12,20]. La faible réalisation de cet examen dans notre étude s'expliquerait par des raisons pécuniaires.

Les germes en causes dans les cellulites cervico-faciales sont variables ; il s'agit le plus souvent de germes commensaux de la cavité buccale. La prédominance des germes anaérobies fait l'unanimité des auteurs [16,21]. Dans cette série, une étude bactériologique n'a pu être réalisée que par 20 patients, ceci principalement en raison de difficultés d'intendance. Aussi, cet examen n'est pas toujours disponible dans les laboratoires médicaux de nos centres hospitaliers. Sur cet échantillon de 20 patients, la culture s'est révélée négative dans la grande majorité des cas. La prise d'antibiotique avant le prélèvement du pus, les mauvaises conditions de prélèvement et de transport du pus pourraient expliquer les cultures infructueuses dans cette étude. Aucun germe anaérobie n'a été identifié dans cette série. Les bactéries identifiées (staphylocoques et streptocoques) étaient sensibles aux bêta-lactamines (pénicillines et céphalosporines) et aux aminosides.

Sur le plan thérapeutique, les patients étaient traités soit en ambulatoire pour les cellulites circonscrites séreuses, soit en hospitalisation pour les cellulites circonscrites suppurées, les cellulites diffusées et les cellulites diffuses. Notre protocole thérapeutique est semblable à celui indiqué dans la littérature [1,5,11,14,15,21]. L'antibiothérapie associait systématiquement Amoxicilline + acide clavulanique et du Métronidazole en voie orale pour les cellulites séreuses, et par voie parentérale dans les autres cas. Dans les cellulites diffuses, il s'agissait d'une trithérapie associant aux deux précédents antibiotiques de la gentamycine avec surveillance de la fonction rénale. Cette antibiothérapie, initialement probabiliste, était réajustée lorsqu'un antibiogramme était réalisé.

La corticothérapie, largement prescrite dans cette série, vise à lever les œdèmes inflammatoires obstructifs et favoriser ainsi une meilleure diffusion de l'antibiotique en améliorant la perfusion tissulaire autour des zones gangreneuses [11,12].

Les différents gestes chirurgicaux (drainage des collections, nécrosectomie) doivent se réaliser idéalement sous anesthésie générale. L'anesthésie générale permet de réaliser des gestes complets dans de conditions confortables pour le chirurgien et pour le patient. Dans cette série, en raison de difficultés d'intendance, les différents gestes chirurgicaux ont été réalisés au fauteuil sous anesthésie locale car le retard dans leur réalisation pourrait aggraver la maladie. Toutefois, le drainage des collections

médiastinales et orbitaires, beaucoup plus complexe, a été exécuté sous anesthésie générale. A chaque fois que la porte d'entrée était dentaire, l'extraction dentaire était réalisée après une mécanothérapie intensive au moyen d'un bouchon de liège, permettant d'améliorer l'ouverture buccale. Pour les patients hospitalisés, cette extraction dentaire était réalisée avant la sortie médicale du patient afin d'éviter de le perdre de vue sans avoir pu extraire la dent causale. Les pertes de substances cutanées bénéficiaient d'une cicatrisation dirigée lorsqu'elles étaient peu étendues ; les vastes pertes de substances étaient reconstruites par greffe de peau sous anesthésie générale. Pour ce qui est des cellulites compliquant une fracture mandibulaire négligée, l'ostéosynthèse mandibulaire était réalisée après avoir complètement juguler l'infection.

Malgré la précarité des conditions socio-économiques des patients qui ne permet pas une prise en charge optimale, des résultats satisfaisants ont été notés dans cette étude. En effet, une évolution favorable était observée chez 121 (95,27%) patients. Cependant, une mortalité de 4,72% a été notée dans cette série. Cette mortalité est inférieure à celle rapportée dans la littérature qui varie entre 6 et 21% [5,7,16].

La durée d'hospitalisation variait entre 1 et 29 jours avec une moyenne de 9 jours $\pm$ 3,9 jours. Les très courtes durées correspondaient aux décès tandis que les longues durées correspondaient aux patients démunis, avec des interruptions régulières de l'antibiothérapie.

Conclusion

Dans cette étude, les cellulites cervico-faciales étaient une affection du sujet jeune de sexe masculin vivant des conditions socio-économiques défavorables avec souvent une prise d'anti-inflammatoire. La porte d'entrée de l'infection était principalement dentaire. Le traitement associait antibiothérapie, drainage des collections suppurées et traitement de la porte d'entrée de l'infection, permettant d'obtenir très souvent une évolution favorable. Pour une affection éminemment évitable, l'accent doit être mis sur la prévention qui passe par la promotion de la santé bucco-dentaire et la mise en œuvre d'une couverture sanitaire pour tous.

Déclaration d'intérêt Les auteurs ne déclarent aucun conflit d'intérêt en lien avec cet article.

Contributions des auteurs : Protocole de recherche, collecte et analyse des données : CONGO Rachid Jocelyn ; recherche bibliographique et rédaction de l'article : BAZAME Clovis Bienfaisance T, DANI Motandi, COULIBALY Arsène ; Relecture finale : KABORE Wendpouloumdé Aimé Désiré, MILLOGO Mathieu, KONSEM Tarcissus ; Superviseur : KONSEM Tarcissus. Tous les auteurs ont contribué à la correction finale.

Références

1. Mboua Ndenga V-J, Ngo Nyeki A-R, N'djeudjui C, Mossus Y, Chimi N, Amougou S et al. Epidemiologic, diagnostic and therapeutic aspects of the odontogen cervico facial cellulitis in Ebolowa Regional Hospital Center. *J Sci. Dis.* 2025;3(2):31-6.
2. Fongoro H, Touré A, Koïta H, Kassambara A, Sissoko Y, Traoré A et al. Cellulites cervico-faciales d'origine dentaire au Centre de Santé de Référence de Dioila de Mali. *ESI Preprints* 2025;37:353-60.
3. Anzouan- Kacou E, Yapo A, Behibro R, Seguy F, Late S, Konan E. Cellulites cervico-faciales de l'enfant : aspects épidémiologiques, cliniques et thérapeutiques au CHU de Treichville (Abidjan). *Rev Col Odonto-Stomatol Afr Chir Maxillo-fac.* 2022;29(3):20-5.
4. Kouakou KR, Ouattara B, Sidibé O, Boka BL, Daweni J KM. Cellulites cervico-faciales diffusées et nécrosantes : aspects épidémiologiques, cliniques et thérapeutiques en 15 ans au CHU de Cocody (Côte d'Ivoire). *Rev Col Odonto-Stomatol Afr Chir Maxillo-fac.* 2018;25(2):5-9.
5. Togo S, Ouattara MA, Saye J, Sangaré I, Touré M, Maiga I. Les cellulites cervico-faciales nécrosantes d'origine dentaire dans un pays en voie de développement. *Rev Mal Respir* 2017;34(7):742-8.
6. Ouédraogo YCL, Bayala J-P, Sawadogo DR, Dahourou EM, Diari LA, Konsem T. Cellulites cervico-faciales graves, morbidité et mortalité : à propos de 150 cas au CHU Yalgado Ouédraogo au Burkina Faso. *Rev Col Odonto-Stomatol Afr Chir Maxillo-fac.* 2023;30(3):50-6.
7. Ag Med Elmehti Elansari MS, Dienta L, Doumbia A, Diarra SM, Maïga M, Maïga O et al. Cellulite cervico-faciale dans un centre régional du Mali : une série de 31 cas. *Jacccr Infectiology* 2020;2(2):1-7.
8. Djémi EM, Zegbeh NEK, Vroh BTS, Béréte PIJ, Crezoit GE. Cellulites cervico-faciales diffuses : caractéristiques cliniques et facteurs de risque de mortalité. *Health. Sci. Dis.* 2022;23(10):10-3.
9. Bouraïma FA, Hounkpatin SHR, Vodouhe UB, Akanni D. Aspects diagnostiques et thérapeutiques des cellulites cervico-faciales à Parakou, Bénin. *J. Rech. Sci. Univ. Lomé* 2019;21(2):299-307.
10. Halwani C, Hachicha H, Zgolli C, Akkari K, Mhammed R Ben. Facteurs prédictifs de gravité des cellulites cervico-faciales : A propos de 180. *J Tun Orl.* 2018;40:41-5.
11. Zegbeh NEK, Digbeu OKE, Béréte PIJ, Faozo L. Facial Cellulitis of Dental Origin: Experiments from the University of Bouaké Health Centre (Cote d'Ivoire). *OJST* 2020;5(10):97-105.
12. Taonsa RAJ, Sanfo M, Millogo M, Dargani MF. Cellulite diffuse cervico-thoracique d'origine dentaire compliquée de pyothorax : à propos d'un cas au centre hospitalier universitaire de Tengandogo (Burkina Faso). *Rev Col Odonto-Stomatol Afr Chir Maxillo-fac.* 2023;30(3):57-61.
13. Arrob A, Tourabi K, Abouchadi A. Pyothorax compliquant une cellulite cervicale d'origine dentaire: à propos d'un cas. *PAMJ Clin Med.* 2020;4(68):1-5.
14. Békono CA, Nkodo Etende Y, Nnanga Mbozo'o J-C, Passi S, Eko Bimale O, Amengle A et al. Clinical, therapeutic and prognostic aspects of dental cellulitis at Sangmélina Referral Hospital. *J Sci Dis.* 2025;1(1):35-40.
15. Kwedi KGG, Elobo Ntalabe J-G, Kwedi RKK, Ewo C, Bengondo Messanga C. Odontogenic cellulitis in the town of Mbalmayo: epidemiological, clinical, paraclinical and therapeutic aspects. *J Sci Dis.* 2025;2(3):29-35.
16. Bissa HC, Salou M, Pegbessou EP, Amana B Dossim

- S, Tigossou S, Dagnra AY, Kpemissi E. Aspects épidémiologiques et bactériologiques des cellulites cervico-faciales au CHU Sylvanus Olympio de Lomé. RAORL-CCF 2014;14(1):32-6.
17. Rakotoarimanana FVA, Haminason LS, Rafenomanjato MM, Rasolondraibe AF, Randriamanantena T. Cellulites cervico-faciales chez l'enfant. HNJM 2022;3:321-32.
18. Riahi I, Tbini M, Bouziri S, Chaouachi S, Ben Naceuf I, Lahiani R, Ben Salah M. Diabète et complications des cellulites cervico-faciales. Ann Endocrinol-Paris. 2024;85(5):531-5.
19. Ghammam M, Houas J, Chouchane L, Meherzi A, Mallat N, Bellakhder M, Kermani W, Abdelke M. Les cellulites cervico-faciales : A propos de 82 cas. J. Tun Orl. 2019;42:37-41.
20. W El Abed, H Krimi, S Lezid et al. Les cellulites cervico-faciales d'origine dentaire : Approches diagnostique et thérapeutique. J. Tun Orl. 2019;41:41-5.
21. Randriamanantena T, Rafenomanjato MM, rakotoarimanana FVD, Raotoson HS, Andriamanantena RH, Razakaharimanana SL, Rakotoarison RA. Cellulites odontogènes : statut bactériologique et aspect thérapeutique. HNJM 2022;3:288-9



High prevalence of multidrug-resistant bacteria in diabetic foot infections: a series of 59 cases at a district hospital in Cameroon

Prévalence de bactéries multirésistantes dans les infections du pied diabétique : à propos de 59 cas dans un hôpital de district au Cameroun

Ngono CS ^{1,2}, Nko'o MHJ ^{1,2}, Nguea Ndjame AG ^{3,4}, Noah Onana MN ², Obono Fouda P ¹, Kemgou FR ⁵, Ateba Ateba NS ¹, Atangana Ekobo HN ¹, Ntone Enyime SV ¹, Bidjogo Gwet MM¹, Zeh Mabiom GA², Noah Noah D ^{1,2}

Original Article

1. Faculty of Medicine and Pharmaceutical Sciences, University of Ebolowa
2. Sangmélima Referral Hospital
3. Faculty of Medicine and Pharmaceutical Sciences, University of Douala.
4. Central Hospital of Yaoundé
5. University Institute of Science and Technology, Yaoundé
6. Yaoundé General Hospital

Corresponding author

: Ngono Claire Sandrine,
Department of Internal Medicine and Specialties, Faculty of Medicine and Pharmaceutical Sciences, University of Ebolowa, Sangmélima Reference Hospital, Email: clairesngono12@gmail.com, Tel : (+237) 659147829

Key words: Diabetic foot, infection, antibiogram, multidrug resistance, sub-Saharan Africa

Mots-clés : Pied diabétique, infection, antibiogramme, bactéries multirésistantes, Afrique subsaharienne.

Date de soumission: 28/07/2025

Date d'acceptation: 03/12/2025

ABSTRACT

Introduction: Diabetic foot infections (DFI) represent a common and significant healthcare challenge, particularly in low-resource settings like Sub-Saharan Africa. This study aimed to outline the epidemiological, clinical, and microbiological aspects along with the patterns of anti-biotic susceptibility relevant to DFI in Yaoundé.

Materials and Methods: A cross-sectional study was conducted at Cité Verte District Hospital from October 15, 2022, to July 21, 2023. We enrolled diabetic patients with infected foot ulcers. Bacteriological samples were taken to identify the causative pathogens and determine their anti-biotic susceptibility profile.

Results: The study sample comprised 59 patients, mostly male, with a mean age of 52 ($\pm$ 11.8) years. A significant proportion of patients had type 2 diabetes (88%) which lasted for less than a decade. Foot ulcers were chronic and severe (66% Wagner grade 3), and only 39% had received some form of education on foot care. The predominant pathogens identified were gram-negative bacilli, including *Klebsiella pneumoniae* (20%), *Proteus mirabilis* (10%), *Escherichia coli* (8%), followed by gram-positive cocci *Staphylococcus saprophyticus* (36%). There was polymicrobial infection in 17% of cases. Other notable findings included high level resistance to amoxicillin-clavulanic acid, cephalosporins, and vancomycin. These findings suggest the presence of com-mon multidrug resistant and strains resistant to methicillin.

Conclusion: The study highlights the prevalence of multidrug-resistant bacteria in DFI in Yaoundé, limiting therapeutic options. Strengthening preventive education, improving microbiological diagnostic capacity, and adapting antibiotic stewardship are critical in such resource-limited settings.

RESUME

Introduction : L'infection du pied diabétique (IPD) est une complication grave du diabète, particulièrement redoutable en Afrique subsaharienne en raison des ressources limitées. Cette étude visait à décrire les aspects épidémiologiques, microbiologiques et les profils de résistance des bactéries isolées dans les IPD à Yaoundé.

Méthodes : Une étude transversale descriptive a été réalisée entre le 15 octobre 2022 et le 21 juillet 2023 à l'Hôpital de District de la Cité Verte. Tous les patients diabétiques présentant une ulcération du pied infectée ont été inclus. Les prélèvements bactériologiques effectués ont permis d'identifier les germes et d'évaluer leur sensibilité aux antibiotiques.

Résultats : Cinquante-neuf patients ont été inclus, majoritairement des hommes (61 %), d'un âge moyen de 52 $\pm$ 11.8 ans, avec un diabète de type 2 (88 %). Les ulcères étaient anciens (>1 mois dans 98 %), sévères (66 % de grade 3 selon Wagner), et 39 % des patients avaient reçu une éducation préventive. Les pathogènes isolés étaient majoritairement des bacilles Gram négatifs (*Klebsiella pneumoniae* 20 %, *Proteus mirabilis* 10 %, *Escherichia coli* 8 %) et des cocci Gram positifs (*Staphylococcus saprophyticus* 36 %). Les infections polymicrobiennes concernaient 17 % des prélèvements. Une résistance élevée aux antibiotiques a été observée, notamment aux bêta-lactamines et à la vancomycine.

Conclusion : La forte prévalence des bactéries multirésistantes dans les IPD à Yaoundé appelle à renforcer la prévention, l'accès au diagnostic microbiologique et à des protocoles antibiotiques adaptés.

DOI : <https://doi.org/10.64294/jsd.v3i4.193>

Introduction

Infected diabetic foot ulcers (DFUs) are a common and serious complication of diabetes mellitus, particularly in sub-Saharan Africa where access to specialized care remains limited (1,2). This condition is a major cause of hospitalization and non-traumatic amputation in the region [1,3]. Similar to other low to middle-income nations, Cameroon case series illustrate a male predominance, averaging around 50 years of age, associated to a short duration of diabetes prior to ulcer development. DFU prevention and therapeutic education remain underdeveloped which contributes to delays in care-seeking as well as the onset of deep infections (2,3). From a microbiological standpoint, bacterial profiles associated with DFUs in Africa diverge from those in higher income countries. While *Staphylococcus aureus* often predominates in Western countries, several African studies report a predominance of Gram-negative bacilli like *Klebsiella pneumoniae* and *Escherichia coli* (4–6). The rising rates of antimicrobial resistance coupled with high rates of multidrug resistant bacteria is problematic (7–9). In this respect, we would like to report the epidemiological and microbiological data along with the resistance patterns pertaining the infections to diabetic foot (10) in Cité Verte District Hospital, Yaoundé, with the intent of enhancing the local intelligence for better clinical outcomes.

Materials and Methods

A descriptive cross-sectional study took place at the Cité Verte District Hospital in Yaoundé, Cameroon, which is a reference center for the management of diabetic foot ulcers (DFUs), between October 15, 2022, and July 21, 2023. The diagnosis of diabetic foot ulcer was made as per the International Working Group on the Diabetic Foot (IWGDF) 2023 criteria. The microbiological analyses were performed in collaboration with SANTE PLUS laboratory which is accredited for clinical bacteriological examinations. Patients number with diabetes and foot infection ulcers that were seen outpatient or inpatient and gave their informed consent to participate were included consecutively. A clinical and microbiological data collection form was used to collect the data from the patients anonymously. The data entered into Microsoft Word were then transferred into Microsoft Excel 2013 and IBM SPSS Statistics version 21. Quantitative variables were described using means, standard deviations, and medians, while qualitative variables were expressed as frequencies and percentages. The research has been given the green light by the ethics committee in charge.

Results

Fifty-nine (59) patients with infected diabetic foot ulcers (DFU) were involved in the study. The study population was predominantly male (61%), with a sex ratio of 1.5. The mean age was 52 years (± 11.8) with

a range of 49 to 89 years. The 40 - 49 age group was the most represented (51%). Type 2 diabetes mellitus was diagnosed in most patients (88%, $n=52$) and in 73% of the cases, the duration of diabetes was less than a decade. Ulcer location-wise, blisters were the leading cause (35%). The wounds were very severe with 66% of them being classified as Wagner grade 3 and had been developing for more than one month in 98% of cases. The duration of the ulcer in 47% of patients was more than four months. Most patients (90%) reported recent antibiotic use. Participants who received education on diabetic foot prevention accounted for only 39%. Bacteriological profile of wounds Bacterial organisms was obtained in all the samples.

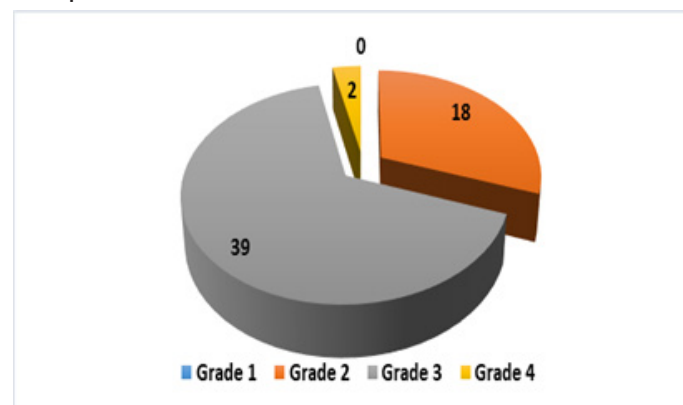


Figure 1: distribution of samples by infection severity

Bacteria were isolated from all samples. Isolated gram-positive cocci (GPC) were found in 46% of instances ($n=27$), mostly *Staphylococcus saprophyticus* (36%, $n=21$). Gram negative bacilli (GNB) were isolated in 66% of cases ($n=39$), with *Klebsiella pneumoniae* (24%, $n=14$) as the most common. There were polymicrobial infections in 17% of cases ($n=10$).

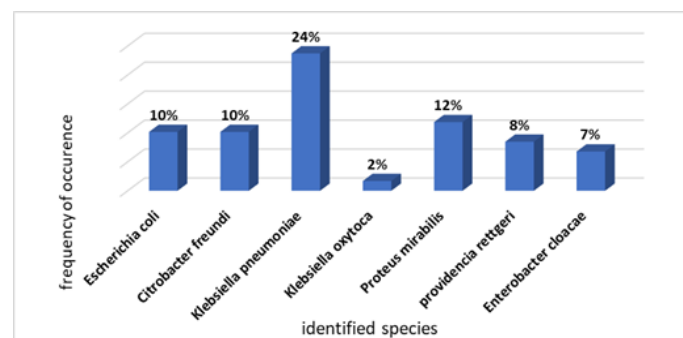


Figure 2: distribution of isolated Gram-negative bacteria

Isolates of *Staphylococcus aureus* showed notable resistance to vancomycin (100%) and oxacillin (80%). *Staphylococcus saprophyticus* showed 95% resistance to vancomycin and 75% to oxacillin. Isolates from *Proteus mirabilis*, *Citrobacter freundii*, *Enterobacter cloacae*, and *Klebsiella pneumoniae* showed significant resistance to penicillin (100%) as well as first- and second-generation cephalosporins. However, all tested GNB isolates exhibited sensitivity to carbapenems.

Table I: bacteriological profile of infected diabetic foot ulcers (n=59)

Type of organism	Species	Number (n)	Percentage (%)
Gram-positive cocci (GPC)	All GPC	27	46
	Staphylococcus aureus	5	8
	Staphylococcus epidermidis	1	2
	Staphylococcus saprophyticus	21	36
Gram negative bacilli (GNB)	All GNB	39	54
	Escherichia coli	6	10
	Citrobacter freundii	6	10
	Klebsiella pneumoniae	14	24
	Klebsiella oxytoca	1	2
	Proteus mirabilis	7	12
	Providencia rettgeri	5	8
	Enterobacter cloacae	4	7
Polymicrobial	-	10	17

Table II: antibiotic resistance patterns of bacteria isolated from diabetic foot ulcers

Bacterial species	Antibiotics with resistance $\geq 50\%$	Antibiotics with preserved susceptibility ($>70\%$)
Staphylococcus aureus	Vancomycin (100%), Oxacillin (80%), Tetracycline (80%), Norfloxacin (60%)	Erythromycin, Lincomycin, Gentamicin (80%)
Staphylococcus saprophyticus	Vancomycin (95%), Oxacillin (75%), Norfloxacin (50%), Tetracycline (55%)	Erythromycin, Lincomycin (80–100%)
Staphylococcus epidermidis	No significant resistance	Susceptible to all tested antibiotics (100%)
Proteus mirabilis	Amoxicillin, Amox-clav, TMP-SMX (100%), Cefuroxime, CRO (86%)	Imipenem, Amikacin (100%), CIP (86%)
Klebsiella pneumoniae	Amoxicillin (100%), Amox-clav (93%), CRO (71%)	Imipenem (93%), Amikacin (100%), CIP (86%)
Citrobacter freundii	Amoxicillin, Amox-clav, TMP-SMX (100%), FOX, CXM (100%)	Imipenem (100%), Amikacin (83%)
Enterobacter cloacae	Amoxicillin, Amox-clav, CRO, CXM, TMP-SMX (100%)	Imipenem (100%)
Providencia rettgeri	Amox-clav (100%), Amoxicillin (80%)	Imipenem (100%), CIP, Amikacin, Chloramphenicol (60%)
Klebsiella oxytoca	Amoxicillin, Amox-clav, CXM, CRO, CAZ, FEP, CIP, Amikacin, TMP-SMX (100%)	Imipenem, ATM (100%)

Abréviations :

- CRO = Ceftriaxone, CXM = Cefuroxime, CAZ = Ceftazidime, FEP = Cefepime, ATM = Aztreonam
- TMP-SMX = Trimethoprim-sulfamethoxazole, CIP = Ciprofloxacin, FOX = Cefoxitin
- Amox-clav = Amoxicillin-clavulanic acid

Discussion

In this study, patients with infected DFUs were mostly middle-aged men, a characteristic typically described in low- and middle-income countries (11,12). Increased trauma exposure and low use of preventive care may account for this male predominance (11). The observed mean age is in line with data from sub-Saharan Africa and Cameroon, where diabetes is frequently diagnosed after the fact (1,12). Therapeutic education remains a difficulty in resource-limited contexts (2,3). Less than 40% of our patients had received advice on preventing DFU, which is consistent with deficiencies found in earlier studies conducted in Africa (3). Delays in seeking care, which exacerbate diabetic foot infections, are a result of this lack of education (2,3). Chronicity of wounds increases the risk of amputation and bacterial colonization (4,11).

From a microbiological perspective, we detected a prevalence of Gram-negative bacilli such as *Klebsiella pneumoniae* and *Escherichia coli*, consistent with regional findings (5,6). This picture contrasts with high-income countries where *Staphylococcus aureus* remains the main isolated pathogen (4). Some African series have reported the presence of *Staphylococcus saprophyticus*, which raises concerns regarding its pathogenicity or possible environmental contamination (6). Our study's polymicrobial infection rate was lower than other African studies, which may have been caused by sampling methods or past antibiotic use (5). However, polymicrobial infections are still prevalent in chronic DFUs and need to be properly managed.

One of the biggest challenge to treating DFUs in Africa is antibiotic resistance (7,8). High resistance to fluoroquinolones and beta lactams was noted in our series, consistent with regional pattern (7,8).

The presence of multidrug-resistant strains and methicillin-resistant *Staphylococcus aureus* (MRSA) complexifies therapeutic management (9). Although carbapenems retain their effectiveness, their high cost and limited availability restrict their use in our setting (7,8).

The WHO emphasizes the urgency of strengthening strategies to combat antimicrobial resistance, notably through rational antibiotic use, appropriate prescribing, and systematic use of antibiograms prior to antibiotic therapy (9). These measures are useful to decrease morbidity and improve functional outcomes for diabetic patients with DFUs in resource-limited

settings (3,5).

Our study contributes to documenting the local specificities of DFU infections in Cameroon and highlights the need to develop prevention policies, structured therapeutic education, and microbiological surveillance to optimize DFU management. Strengthening the capacity of healthcare providers and improving access to effective antibiotics remain priorities in combating DFU complications in our context.

Conclusion

Diabetic foot infections are still a frequent and serious problem in our environment. This study points out the main contribution of Gram-negative bacilli as well as multidrug-resistant profiles that are very alarming and allow only a few therapeutic options. Prevention is inadequate and there is not enough education for therapy, which means that the patient becomes more and more aware of the problem. The use of antibiograms should be part of the strategy for adjusting antibiotic treatment and preventing the spread of multidrug-resistant strains. The implementation of microbiological surveillance programs and the revision of the management protocols are important for improving the outcomes in diabetic patients.

Acknowledgement

We wish to express our heartfelt gratitude to Dr. NGONO Hélène Valérie, medical biologist from the SANTE PLUS laboratory, for her support and supervision of the bacteriological analyses. We also express our sincere thanks to the staff of the SANTE PLUS laboratory and the Cité Verte District Hospital for their availability and collaboration. Our appreciation goes also to the patients who have accepted to participate in this study, thus becoming the co-creators of the new knowledge.

Author contributions

Ngono Claire Sandrine (a,b), Nko'o Moise Henry Julien (a,b), Nguea Ndjame Arlette Géraldine (a,b), Noah Onana Marie Noelle (b), Obono Fouda Mballa Patrick (b), Kemgou Franklin Roosevelt (b), Ateba Ateba Nelly Stella (b), Atangana Ekobo Huguette Noelle (b), Ntone Enyime Samuel Vianney (b), Bidjogo Gwet Marina Madeleine (b), Zeh Mabiom Gabriel Arsène (b), Noah Noah Dominique (c)

(a) "conception and design, acquisition of data, analysis and interpretation of data", (b) "drafting the article, revising it critically for important intellectual content", (c) "final approval of the version to be published".

Conflicts of interest: Authors declare no conflict of interest

References

- Hall V, Thomsen RW, Henriksen O, Lohse N. Diabetes in Sub Saharan Africa 1999-2011: Epidemiology and public health implications. a systematic review. *BMC Public Health*. 14 juill 2011;11:564.
- Pastakia SD, Pekny CR, Manyara SM, Fischer L. Diabetes in sub-Saharan Africa – from policy to practice to progress: targeting the existing gaps for future care for diabetes. *Diabetes Metab Syndr Obes Targets Ther*. 22 juin 2017;10:247 63.
- Ndip EAA, Tchakonte B, Mbanya JC. A Study of the Prevalence and Risk Factors of Foot Problems in a Population of Diabetic Patients in Cameroon. *Int J Low Extrem Wounds*. juin 2006;5(2):83 8.
- Lipsky BA, Berendt AR, Cornia PB, Pile JC, Peters EJG, Armstrong DG, et al. 2012 Infectious Diseases Society of America Clinical Practice Guideline for the Diagnosis and Treatment of Diabetic Foot Infections. *Clin Infect Dis*. 15 juin 2012;54(12):e132 73.
- Wada FW, Mekonnen MF, Sawiso ED, Kolato S, Woldegiorgis L, Kera GK, et al. Bacterial profile and antimicrobial resistance patterns of infected diabetic foot ulcers in sub-Saharan Africa: a systematic review and meta-analysis. *Sci Rep*. 5 sept 2023;13(1):1 10.
- Luisa Nang EO, Milca A. Microbial Profile of Diabetic Foot Ulcers of Patients Attending the Regional Hospital Bamenda (Cameroon). *Acta Sci Med Sci*. 1 févr 2024;19 24.
- Makeri D, Odoki M, Eilu E, Agwu E. Update on prevalence and antimicrobial resistance of *Staphylococcus aureus* and *Pseudomonas aeruginosa* isolated from diabetic foot ulcers in Africa: a systematic review and meta-analysis. *Bull Natl Res Cent*. 10 oct 2023;47(1):145.
- Lawal OU, Ayobami O, Abouelfetouh A, Mourabit N, Kaba M, Egyir B, et al. A 6-Year Update on the Diversity of Methicillin-Resistant *Staphylococcus aureus* Clones in Africa: A Systematic Review. *Front Microbiol*. 3 mai 2022;13:860436.
- World Health Organization. Global action plan on antimicrobial resistance [Internet]. Geneva: World Health Organization; 2015 [cité 27 juin 2025]. 28 p. Disponible sur: <https://iris.who.int/handle/10665/193736>
- Fitridge R, Game F, Senneville É, Nicolaas C. Schaper (chair), Jaap J. van Netten.
- World Health Organization. Global report on diabetes [Internet]. Geneva: World Health Organization; 2016 [cité 27 juin 2025]. 83 p. Disponible sur: <https://iris.who.int/handle/10665/204871>
- Tindong M, Palle JN, Nebongo D, Aminde LN, Mboue-Djieka Y, Mbarga NTF, et al. Prevalence, Clinical Presentation, and Factors Associated With Diabetic Foot Ulcer in Two Regional Hospitals in Cameroon. *Int J Low Extrem Wounds*. mars 2018;17(1):42 7.



Factors associated with academic performance in children living with epilepsy followed in a pediatric referral hospital in Cameroon

Facteurs associés à la performance académique chez les enfants vivant avec une épilepsie suivis dans un hôpital pédiatrique de référence au Cameroun

Enyama D^{1,2}, Noukeu Njinkui D^{1,2}, Massoh Kamte IO¹, Kago Tague DA³, Gams Massi D⁴, Mbonda Chimi PC³, Nguefack S³

Original Article

1. Department of Pediatrics, Child and Adolescent Health, Faculty of Medicine and Pharmaceutical Sciences, University of Dschang, Dschang, Cameroon
2. Pediatric Department, Douala Gyneco-Obstetric and Pediatric Hospital, Douala, Cameroon
3. Department of Pediatrics, Faculty of Medicine and Biomedical Sciences, University of Yaoundé 1, Yaoundé, Cameroon
4. Department of Clinical Sciences, Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon

Corresponding author: ENYAMA Dominique, Department of Pediatrics, Douala Gyneco-Obstetric and Pediatric Hospital, P. O. Box 7270, Douala, Cameroon, Phone number: +237 698858899, E-mail: enyamad@yahoo.fr

Key words: Epilepsy, Academic performance, Children, Associated factors, Cameroon

Mots clés : Épilepsie, Résultats scolaires, Enfants, Facteurs associés, Cameroun

Date de soumission: 03/09/2025
Date d'acceptation: 03/12/2025

ABSTRACT

Background: Epilepsy is a chronic neurological condition affecting children's neurocognitive development and academic performance. This study aimed to describe academic performances of children with epilepsy and identify their determinants in Douala, Cameroon.

Materials and Methods: This cross-sectional analytical study (November 2024-April 2025) included 102 school-enrolled children aged 6 to 15 years with confirmed epilepsy diagnoses. Data collection involved structured questionnaires administered to parents/guardians, clinical examinations by a pediatric neurologist, and medical record reviews. Academic performance was assessed using last trimester grades, with good academic performance, defined as a grade $\geq 10/20$. Statistical analysis employed chi-square tests, Fisher's exact tests, and logistic regression. The significance threshold was set for $p < 0.05$.

Results: Among 102 participants, average age at diagnosis was 55.5 ± 36.6 months, with slight female predominance (52.9%). Idiopathic epilepsy was most common (60.8%). Poor academic performance occurred in 32.4% of children, while 38.2% had repeated a grade. Factors associated with good academic performance included idiopathic epilepsy (aOR = 13.241, 95% CI [2.393-73.266]), age over 5 years at diagnosis (aOR = 1.862, 95% CI [0.581-5.974]), and after-school academic support (aOR = 4.395, 95% CI [1.554-12.426]). High seizure frequency was associated with poor academic performance (aOR = 0.293, 95% CI [0.105-0.822]).

Conclusion: This study revealed a strong association between epilepsy and reduced academic achievement in children. Findings highlight the need for comprehensive management strategies including early screening and intervention for learning challenges to minimize epilepsy's impact on educational progress.

RESUME

Contexte : L'épilepsie est une affection neurologique chronique qui affecte le développement neurocognitif et les résultats scolaires des enfants. Cette étude visait à décrire les résultats scolaires des enfants épileptiques et à identifier leurs déterminants à Douala, au Cameroun.

Matériel et méthodes : cette étude analytique transversale (novembre 2024-avril 2025) a porté sur 102 enfants scolarisés âgés de 6 à 15 ans présentant un diagnostic confirmé d'épilepsie. La collecte des données s'est faite à l'aide d'un questionnaire structuré administré aux parents/tuteurs à partir des dossiers médicaux, après un examen clinique effectué par un neuropédiatre. Les résultats scolaires ont été évalués à partir des notes obtenues au dernier trimestre, les mauvais résultats étant définis comme $< 10/20$. L'analyse statistique a consisté aux tests du chi carré, test exact de Fisher et de régression logistique.

Résultats : parmi les 102 participants, l'âge moyen au moment du diagnostic était de 55,5 mois, avec une légère prédominance des filles (52,9 %). L'épilepsie idiopathique était la plus fréquente (60,8 %). 32,4 % des enfants avaient de mauvais résultats scolaires, tandis que 38,2 % avaient redoublé au moins une classe. Les facteurs associés à de bons résultats scolaires comprenaient l'épilepsie idiopathique (aOR = 13,241, IC à 95 % [2,393-73,266]), un âge supérieur à 5 ans au moment du diagnostic (aOR = 1,862, IC à 95 % [0,581-5,974]) et le soutien scolaire après l'école (aOR = 4,395, IC à 95 % [1,554-12,426]). Une fréquence élevée des crises était associée à de mauvais résultats scolaires (aOR = 0,293, IC à 95 % [0,105-0,822]).

Conclusion : Cette étude a révélé une forte association entre l'épilepsie et la baisse des résultats scolaires chez les enfants. Les résultats soulignent la nécessité de mettre en place des stratégies de prise en charge globales, notamment un dépistage précoce et une intervention rapide en cas de difficultés d'apprentissage, afin de minimiser l'impact de l'épilepsie sur la scolarité.

DOI : <https://doi.org/10.64294/jsd.v3i4.194>

Introduction

Epilepsy is one of the most common brain disorders, affecting 50 million people worldwide, with serious physical, psychological, social, and economic consequences for affected individuals and their families [1]. Epilepsy in children can be linked to significant learning and behavioral problems, leading to poor academic outcomes; several factors contribute to these educational challenges, primarily brain pathology, ongoing seizures, antiepileptic drugs, and psychosocial issues [2]. Nine out of ten people with epilepsy in low-income countries (LICs) are under 20 years old [3]. With a prevalence of approximately 7 to 8 per 1,000 children under 11 years, it is the most common neurological condition in the pediatric population [4]. Children with epilepsy in Sub-Saharan Africa (SSA) experience higher rates of school dropout, more days absent from school, and reduced participation in extracurricular sports activities [5,6]. Most existing studies have focused on teachers' beliefs and perceptions. Teachers' misconceptions about epilepsy are common. Few studies have examined barriers to education from the perspective of children with epilepsy and their families. This study aims to address this gap by identifying factors associated with academic performance in children living with epilepsy, followed in a pediatric referral hospital in Douala, Cameroon. The findings will enhance understanding of the challenges these children face and help develop targeted interventions to improve their educational outcomes.

Materials and Methods

We conducted a cross-sectional descriptive and analytical study from November 1, 2024, to April 30, 2025 (6 months) at the pediatrics department of a pediatric referral hospital in Douala. This department includes two units: a hospitalization unit and an outpatient clinic. The hospitalization unit has two sections: general pediatrics for infants and children and neonatology for newborns (0 to 28 days). The outpatient clinic is dedicated to ambulatory care of children aged 0-15 years, including those diagnosed with epilepsy. The hospital is equipped with a clinical biology laboratory, neuroimaging facilities (brain CT scans, ultrasound, and standard radiography), and a video-electroencephalography unit (video-EEG). There is also a physiotherapy unit for patient rehabilitation as well as a clinical psychologist. The health care team includes nurses, one child neurologist, one neonatologist, three general pediatricians, and two general practitioners. Epilepsy management is multidisciplinary and coordinated by the child neurologist.

The study included children aged 6 to 15 years old diagnosed with epilepsy according to the International League Against Epilepsy (ILAE) criteria, who were attending school at the time of the study. All

children in this age group with a confirmed diagnosis of epilepsy, attending school, and whose parents or legal guardians provided informed consent were recruited. Those with incomplete data were excluded. A consecutive, exhaustive sampling method was used.

We contacted the parents or guardians of eligible patients to invite them to take part in the study. Parents or guardians who provided informed consent were asked to accompany their child to the child neurology clinic. The children received a clinical examination from the child neurologist. Additionally, a pre-tested questionnaire, specifically designed for the study was used to collect relevant data. It included sections on sociodemographic details, clinical features of epilepsy, and school information (current grade level, overall grades in the last trimester, history of repeating grades, and extracurricular activities).

Academic performance: refers to the results students achieve in their studies, usually measured through evaluations, exams, and grades. It reflects the student's ability to understand, absorb, and apply the knowledge and skills gained in a school setting. Therefore, we assessed academic performance based on the overall grades received in class [15]. Academic performance was ranked according to the average score out of 20: 18-20 (excellent), 15-17 (very good), 12-14 (good), 10-11 (fair), 08-09 (insufficient), and 00-07 weak. **Poor academic performance** refers to insufficient or unsatisfactory academic results in a student, characterized by low grades, difficulty understanding concepts, or a lack of motivation for studies. Thus, poor academic performance indicates a grade < 10/20 [15]. **Good academic performance** refers to satisfactory or excellent results, marked by a strong understanding of concepts, high grades, and quick skill development. It indicates a grade of $\geq 10/20$ [15].

This study was approved by the ethical board of the study hospital (ethical clearance n°2024/1621/HGOPED/DG/CEI from the 26th November 2024). An authorization was also granted by the Faculty of Medicine and Pharmaceutical Sciences at the University of Dschang (no. B6/3098/24/UDs/FMSP/D/CDAASR). Informed consent forms were signed by parents or guardians who agreed to participate in the study. Children aged 12 or older provided their own consent whenever possible. Participation was voluntary, and data confidentiality was maintained.

Data were entered and coded, then exported to SPSS version 25.0 for Windows (SPSS, IBM, Chicago, IL, USA) for statistical analysis. Quantitative variables were presented as mean $\pm$ standard deviation (SD) or median and interquartile range (IQR). Qualitative variables were presented as frequencies and percentages. Logistic regression models were used to identify factors associated with good academic

performance, defined as a grade $\geq 10/20$, with results expressed as adjusted odds ratios (aOR) and their 95% confidence intervals (CI). A p-value < 0.05 was considered statistically significant.

Results

A total of 102 children living with epilepsy were included in the study (Figure 1).

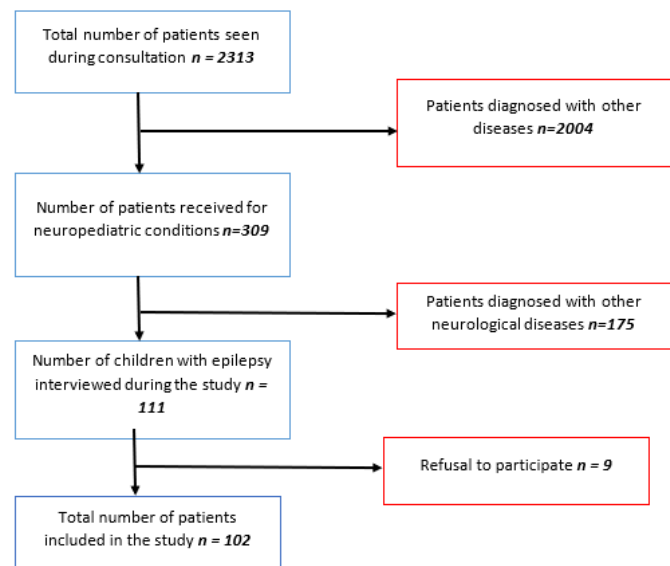


Figure 1. Participants inclusion diagram

The average age of participants was 9 years, with a female predominance (59.9%). Most children were in primary school (88.2%), and among them, the vast majority were in class 1 (42.2%). The average age at diagnosis was 55.5 ± 36.6 months (Table 1).

Regarding the type of epilepsy: 61% had the idiopathic type, 28% the symptomatic type, and 11% the cryptogenic type (Figure 2).

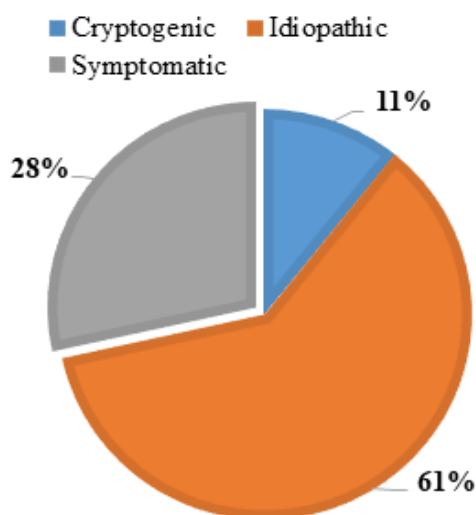


Figure 2. Distribution of participants according to epilepsy types

66.6% of children were on monotherapy, and 30.4% on polytherapy. 49% of children had well-controlled seizures at the time of the study.

Table 1. Sociodemographic characteristics of children and their parents and clinical characteristics of epilepsy

Variables	Modalities	Number (N=102)	Percentages(%)
Children's age group (year)	6-10	70	68.6
	>10	32	31.4
Age group at diagnosis (months)	0-59	51	50.0
	60-119	41	40.2
	120-180	10	9.8
Sex	Male	48	47.1
	Female	54	52.9
School level	Class 1	38	37.3
	Class 2	14	13.7
	Class 3	7	6.9
	Class 4	11	10.8
	Class 5	14	13.7
	Class 6	6	5.9
	Form 1	2	2
	Form 2	2	2
	Form 3	3	2.9
	Form 4	1	1
Secondary	Form 5	2	2
	Lower sixth	1	1
	Upper sixth	1	1
Type of schooling	Normal	97	95.1
	Adapted	5	4.9
School system	Public	15	14.7
	Private	87	85.3
Parent/guardian education level	None	0	0
	Primary	7	6.9
	Secondary	51	50
	Higher	44	43.1
Marital status	In a relationship	85	83.3
	Single parent	17	16.7

Poor academic performance (grades $< 10/20$) was observed in 33 of 102 children (32.4%, 95% CI: 23.8-42.0%). Grade repetition occurred in 39 of 102 participants (38.2%, 95% CI: 29.0-48.2%). Among children with grade repetition, 18 repeated once (18/39, 46.2%) (Table 2). The most common difficulties involved mathematics and languages.

Multivariate analysis identified several factors significantly linked to academic performance. Children with idiopathic epilepsy (aOR = 13.241, 95% CI [2.393-73.266]), those diagnosed after the age of 5 (aOR = 1.862, 95% CI [0.581-5.974]), and children receiving after-school academic support (aOR = 4.395, 95% CI [1.554-12.426]) experienced significantly fewer academic difficulties than others. Conversely, children with frequent seizures faced more academic challenges (aOR = 0.293, 95% CI

[0.105-0.822]) (Table 3).

Children with epilepsy who receive after-school academic support are 4 times more likely to succeed in school, while those with idiopathic epilepsy had significantly higher odds of good academic performance (aOR = 13.241). Also, being diagnosed between ages 5-10 years was found to protect against school failure compared to diagnosis before age 5.

Table 2: Distribution of children with epilepsy according to their academic performance

Variables	Modalities	Frequencies	Percentages (%)
Overall average grade of the child in the last trimester	00-07	23	22.54
	08-09	10	9.8
	10-11	15	14.7
	12-14	30	29.4
	15-17	21	20.6
	18-20	3	2.94
Has the child ever repeated a class	Yes	39	38.2
	No	63	61.8
If yes, number of repetitions	1	18	46.2
	2-3	8	20.5
	>=4	13	33.3

Table 3. Multivariate analysis of factors associated with good academic performance (grade ≥ 10)

Variables	Modalities	Adjusted p-value (<0.05)	Adjusted OR (95% CI)
Age at diagnosis (in months)	0-59	-	-
	60-119	0.047	0.175 (0.031-0.975)
	120-180	0.296	1.862 (0.581-5.974)
Type of epilepsy	Cryptogenic	-	-
	Idiopathic	0.003	13.241 (2.393-73.266)
	Symptomatic	0.795	0.797 (0.144-4.419)
After-school academic support	No	-	-
	Yes	0.005	4.395 (1.554-12.426)
Presence of seizures at school	No	-	-
	Yes	0.911	0.897 (0.133-6.032)
Difficulty resuming school activities after a seizure	No	-	-
	Yes	0.752	1.390 (0.181-10.697)
Has ever missed school due to seizures	No	-	-
	Yes	0.261	0.409 (0.086-1.942)
Main difficulties encountered in their academic journey related to epilepsy	Seizure frequency	0.020	0.293 (0.105-0.822)
	Lack of academic support	0.000	0.086 (0.022-0.334)
	Emotional difficulties	0.053	0.244 (0.058-1.018)

Abbreviations: aOR = adjusted Odds Ratio; CI = Confidence Interval.

Note: The model identifies factors associated with good academic performance (grade $\geq 10/20$). An aOR >1 indicates a positive association with good performance

Discussion

This study revealed that one-third of children with epilepsy experienced academic difficulties, with 32.4% showing poor academic performance and 38.2% having repeated at least one grade. Multivariate analysis identified seizure frequency as the primary modifiable risk factor, while idiopathic epilepsy type and after-school academic support emerged as protective factors.

Description of sociodemographic and clinical characteristics

The sociodemographic and clinical profile of our patients aligns with the typical picture of pediatric epilepsy in many parts of sub-Saharan Africa. We have a slight majority of girls (52.9% vs. 47.1% boys). This sex ratio of 0.89 is similar to other studies conducted in sub-Saharan Africa on pediatric epilepsy, although some may report a slight male predominance [16]. The most common age group (5-10 years, 68.6%) highlights the vulnerability of young schoolchildren, a critical period for learning the basics. The fact that 50% of parents have a secondary education level is an important indicator; higher parental education is often linked to better understanding of health issues, improved treatment adherence, and more effective academic support for the child, though further research is needed to confirm this specific correlation in our setting. The most frequent age group at diagnosis (0 to 59 months) was very early (50% of cases). This early onset, while potentially increasing the risk of long-term developmental issues due to interference with crucial periods of brain development [15,17], also allows for early management and treatment, which are vital for seizure control and may help reduce the impact on cognitive development [3,12]. Idiopathic epilepsy was the most common type in our study (60.8%). Although this predominance of idiopathic forms is often associated with better outcomes and a generally more favorable cognitive prognosis than symptomatic epilepsies, it could nonetheless explain some of the academic difficulties observed overall in our series [15,18].

Description of the academic performance

Our findings on the academic performance of children with epilepsy are significant. The data shows that 32.4% of children faced difficulties, such as poor academic performance, and 38.2% repeated a grade, despite 95.1% attending regular school. This suggests that even epilepsy that appears to be well-managed can still impact cognitive and educational development. These results match international studies that report higher rates of cognitive issues, learning challenges, and academic delays among children with epilepsy compared to the general population [16]. School-related problems can include issues with concentration, memory, and executive functions, all of which influence learning

and academic success. While these challenges may not always cause outright failure, they can increase the child's effort, lead to academic fatigue, and result in underperformance. The fact that 85.3% of children in our series attend private schools may help explain some of these issues, as private schools often offer better supervision and smaller classes, potentially hiding the true level of cognitive difficulty and the need for specialized education. The low percentage of adapted schooling (4.9%) indicates possible underdiagnosis of specific needs or limited access to specialized support. The high rates of grade repetition and learning difficulties observed align with international reports, which frequently highlight cognitive deficits in children with epilepsy [15,18,19]. These difficulties can result from various factors, including the direct effects of seizures on the developing brain, subclinical interictal epileptiform activity, side effects of antiepileptic medications, and associated comorbidities.

Factors associated with good academic performance

Our results showed that seizure frequency is a key factor influencing academic performance. Uncontrolled seizures are often linked to poor academic results, likely due to more widespread epileptic activity and greater disruption of neural networks involved in learning and memory [18,20]. Our multivariate analysis confirmed this relationship, demonstrating that children who identified seizure frequency as their main academic difficulty had significantly lower odds of good academic performance (aOR = 0.293, $p = 0.020$), emphasizing the critical importance of optimal seizure control for educational success. Early onset of epilepsy, especially before acquiring fundamental skills like reading, writing, and arithmetic, can also hinder normal cognitive development, resulting in cumulative deficits [17,21,22]. This is particularly relevant given our finding that being diagnosed between ages 5-10 years protects against school failure compared to diagnosis before the age of 5 (aOR = 0.175, $p = 0.047$), suggesting that epilepsy onset during the preschool years may have more detrimental effects on subsequent academic achievement, possibly due to interference with critical early neurodevelopmental processes.

In our study, idiopathic epilepsy is associated with better academic performance (aOR = 13.241, $p = 0.003$) compared to those with cryptogenic epilepsy, probably because idiopathic epilepsy typically has a more favorable prognosis [18,19]. This striking association underscores the prognostic significance of epilepsy etiology, with idiopathic forms generally reflecting less severe underlying brain pathology and better response to treatment, thereby preserving cognitive and academic functioning.

The availability of tailored academic support is a critical factor; when missing or inadequate, it can worsen academic challenges. Our findings provide strong empirical evidence for this assertion, as children with epilepsy who receive after-school academic support are 4 times more likely to succeed in school (aOR = 4.395, $p = 0.005$). Furthermore, children who identified lack of academic support as their main difficulty had dramatically lower odds of good academic performance (aOR = 0.086, $p < 0.001$), representing an approximately 91% reduction in the likelihood of academic success. Targeted pedagogical and psychological interventions, customized to meet the specific needs of children with epilepsy (such as classroom accommodations and homework assistance), are vital to help them succeed and remain integrated into school [18]. Without such support, minor difficulties can accumulate and lead to dropout. These findings highlight academic support as one of the most modifiable and impactful factors in determining educational outcomes for children with epilepsy, suggesting that investment in structured after-school support programs should be a priority intervention in our setting.

Lastly, our study emphasizes the role of socioeconomic factors and stigmatization. In settings like Cameroon, where specialized educational resources are few, family support and a positive social environment become even more important. Stigmatization can cause social exclusion, low self-esteem, and reduced school participation, thereby worsening learning difficulties. The strong protective effect of after-school academic support observed in our study may be mediated not only through direct educational assistance but also through enhanced family engagement, improved self-esteem, and reduced stigma associated with receiving appropriate, individualized attention to the child's learning needs.

Study limitations

Several limitations warrant consideration. The cross-sectional design precludes establishing temporal relationships between epilepsy characteristics and academic outcomes. Academic performance assessment relied partially on parental reports, introducing potential recall bias. The absence of standardized neuropsychological testing limits our understanding of specific cognitive domains affected. Additionally, recruitment from a single tertiary center may limit generalizability to community-based populations.

Conclusion

These findings support implementing comprehensive epilepsy management strategies that integrate educational support services with medical treatment. Healthcare providers should routinely screen for academic difficulties and advocate for after-school support programs. Future research should

evaluate the effectiveness of structured educational interventions through randomized controlled trials and investigate optimal timing for academic support initiation.

Acknowledgments: The authors thank all the staff of the pediatric ward, as well as the families who participated in the study.

Authorship Contributions: ED conceived the study, designed the methodology, supervised data collection, performed statistical analysis, and drafted the manuscript. MKIO contributed to study design, conducted clinical examinations, collected data, and revised the manuscript. NND participated in data collection and manuscript revision. KTDA provided statistical consultation and contributed to data interpretation. GMD supervised the research process and provided critical manuscript review. MCPC contributed to study design and manuscript revision. NS provided senior supervision, contributed to study conception, and approved the final manuscript version.

Disclosure of Conflicts of Interest: All authors declare no financial or personal relationships that could inappropriately influence this work. No pharmaceutical industry support was received. All authors confirm independence in study conduct and manuscript preparation.

References

1. Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Childhood Illnesses. 2nd ed. Geneva: World Health Organization; 2013 Accessed 25 July 2025]. (WHO Guidelines Approved by the Guidelines Review Committee). <http://www.ncbi.nlm.nih.gov/books/NBK154447/>
2. Vinayan KP. Epilepsy, antiepileptic drugs and educational problems. *Indian Pediatr.* 2006;43(9):786-94.
3. Ba-Diop A, Marin B, Druet-Cabanac M, Ngoungou EB, Newton CR, Preux PM. Epidemiology, causes, and treatment of epilepsy in sub-Saharan Africa. *Lancet Neurol.* 2014;13(10):1029-44. [https://doi.org/10.1016/S1474-4422\(14\)70114-0](https://doi.org/10.1016/S1474-4422(14)70114-0)
4. Dulac O. Issues in paediatric epilepsy. *Acta Neurol Scand Suppl.* 2005;182. <https://pubmed.ncbi.nlm.nih.gov/16359427/>. Accessed 28 March 2025.
5. Ali DB, Tomek M, Lisk DR. The effects of epilepsy on child education in Sierra Leone. *Epilepsy Behav EB.* 2014;37:236-40. <https://doi.org/10.1016/j.yebeh.2014.07.007>
6. Quereshi C, Standing H, Swai A, Hunter E, Walker R, Owens S. Barriers to access to education for young people with epilepsy in Northern Tanzania: A qualitative interview and focus group study involving teachers, parents and young people with epilepsy. *Epilepsy Behav EB.* 2017;72:145-9. <https://doi.org/10.1016/j.yebeh.2017.04.005>
7. Akpan MU, Ikpeme EE, Utuk EO. Teachers' knowledge and attitudes towards seizure disorder: a comparative study of urban and rural school teachers in Akwa Ibom State, Nigeria. *Niger J Clin Pract.* 2013;16(3):365-70. <https://doi.org/10.4103/1119-3077.113465>
8. Mustapha AF, Odu OO, Akande O. Knowledge, attitudes and perceptions of epilepsy among secondary school teachers in Osogbo South-West Nigeria: a community based study. *Niger J Clin Pract.* 2013;16(1):12-8. <https://doi.org/10.4103/1119-3077.106709>
9. Ojinnaka NC. Teachers' perception of epilepsy in Nigeria: a community-based study. *Seizure.* 2002;11(6):386-91. <https://doi.org/10.1053/seiz.2001.0664>
10. Berhe T, Yihun B, Abebe E, Abera H. Knowledge, attitude, and practice about epilepsy among teachers at Ethiopian National School, Addis Ababa, Ethiopia. *Epilepsy Behav EB.* 2017;70(Pt A):150-3. <https://doi.org/10.1016/j.yebeh.2017.02.009>
11. Gebrewold MA, Enquselassie F, Teklehaimanot R, Gugssa SA. Ethiopian teachers: their knowledge, attitude and practice towards epilepsy. *BMC Neurol* 2016;16(1):167. <https://doi.org/10.1186/s12883-016-0690-4>
12. Mushi D, Burton K, Mtuya C, Gona JK, Walker R, Newton CRJC. Perceptions, social life, treatment and education gap of Tanzanian children with epilepsy: a community-based study. *Epilepsy Behav EB.* 2012;23(3):224-9. <https://doi.org/10.1016/j.yebeh.2011.12.003>
13. Ibinga E, Ngoungou EB, Olliac B, Hounsossou CH, Dalmay F, Mouangue G, Atego SJ, Preux PM, Druet CM. Impact of epilepsy on children and parents in Gabon. *Epilepsy Behav EB.* 2015;44:110-6. <https://doi.org/10.1016/j.yebeh.2014.12.035>
14. Munyoki G, Edwards T, White S, Kwasa T, Chengo E, Kokwaro G, Odera VM, Sander JW, Neville BG, Newton CR. Clinical and neurophysiologic features of active convulsive epilepsy in rural Kenya: a population-based study. *Epilepsia.* 2010;51(12):2370-6. <https://doi.org/10.1111/j.1528-1167.2010.02653.x>
15. Fitts W, Rahamatou NT, Abass CF, Vogel AC, Ghislain AH, Sakadi F, Hongxiang Q, Conde ML, Baldé AT, Hamani ABD, Bah AK, Anand P, Patenaude B, Mateen FJ. School status and its associations among children with epilepsy in the Republic of Guinea. *Epilepsy Behav EB.* 2019;97:275-81. <https://doi.org/10.1016/j.yebeh.2019.05.040>
16. Ibekwe RC, Ojinnaka NC, Iloeje SO. Factors Influencing the Academic Performance of School Children with Epilepsy. *J Trop Pediatr.* 2007;53(5):338-43. <https://doi.org/10.1093/tropej/fmm034>
17. Ao A, Sb O, Ja O. School performance of Nigerian adolescents with epilepsy. *Epilepsia.* 2006;47(2). <https://pubmed.ncbi.nlm.nih.gov/16499769/>. Accessed 3 June 2025. <https://doi.org/10.1111/j.1528-1167.2006.00437.x>
18. Aldenkamp AP, Weber B, Overweg-Plandsoen WCG, Reijls R, van Mil S. Educational underachievement in children with epilepsy: a model to predict the effects of epilepsy on educational achievement. *J Child Neurol.* 2005;20(3):175-80. <https://doi.org/10.1177/08830738050200030101>
19. Fastenau PS, Johnson CS, Perkins SM, Byars AW, deGrauw TJ, Austin JK, Dunn DW. Neuropsychological status at seizure onset in children: risk factors for early cognitive deficits. *Neurology.* 2009;73(7). <https://pubmed.ncbi.nlm.nih.gov/19675309/>. Accessed 29 May 2025. <https://doi.org/10.1212/WNL.0b013e3181b23551>
20. Aguiar BVK, Guerreiro MM, McBrien D, Montenegro MA. Seizure impact on the school attendance in children with epilepsy. *Seizure.* 2007;16(8):698-702. <https://doi.org/10.1016/j.seizure.2007.05.013>
21. Reilly C, Neville BGR. Academic achievement in children with epilepsy: a review. *Epilepsy Res.* 2011;97(1-2):112-23. <https://doi.org/10.1016/j.eplepsyres.2011.07.017>
22. Vetri L, Pepi A, Alesi M, Maltese A, Scifo L, Roccella M, Quatrosi M, Elia M. Poor School Academic Performance and Benign Epilepsy with Centro-Temporal Spikes. *Behav Sci.* 2023;13(2):106. <https://doi.org/10.3390/bs13020106>



Itinerary and determinants of loss to follow-up of pregnant women at the Yaoundé Gynaeco-Obstetrics and Paediatric Hospital

Itinéraire et déterminants des pertues de vue chez les femmes enceintes à l'Hôpital Gynéco-Obstétrique de Yaoundé

Nyada SR^{1,2}, Fouda Awona EN¹, Ebong Ebontane C^{1,3}, Tompeen I^{1,5}, Batoum Mboua V^{1,4}, Nsahlai C¹, Dohbit Sama J^{1,5}, Foumane P^{1,6}

Original Article

1. Faculty of Medicine and Biomedical Sciences, The University of Yaoundé 1
2. Gynecological Endoscopic Surgery and Human Reproduction Teaching Hospital, Yaoundé
3. Yaoundé Central Hospital
4. University Teaching Hospital Yaoundé
5. Yaoundé Gynaeco-Obstetrics and Paediatric Hospital
6. Faculty of Medicine and Pharmaceutical Sciences, The University of Ebolowa

Corresponding author: Nyada Serge Robert, Faculty of Medicine and Biomedical Sciences, The University of Yaoundé 1, Email: sergenyadar@yahoo.fr, Tel: (+237)

Key words: loss to follow-up; antenatal care; itinerary; determinants; Yaoundé

Mots clés : Pertues de vue; suivi prénatal; itinéraire; déterminants; Yaoundé

Date de soumission: 31/10/2025

Date d'acceptation: 09/12/2025

ABSTRACT

Introduction: Understanding "loss to follow-up" among pregnant women could help improve follow-up in clinical studies and thereby contribute to goals for prevention, treatment or research being achieved. The aim of our study was to trace the itinerary and assess the determinants of loss to follow-up amongst pregnant women at the Yaoundé Gynaeco-Obstetrics and Paediatric Hospital.

Methods and Materials: We conducted a cross-sectional analytical study from November 6, 2019 to June 2020. We included in our study women who had carried out antenatal care at the Yaoundé Gynaeco-Obstetrics and Paediatric Hospital. Variables of the study were socio-demographic, clinical and itinerary related of loss to follow-up of pregnant women.

Results: We enrolled 405 women; out of who 239 completed their follow-up and 166 women got lost to follow-up, giving a 41% proportion of loss to follow-up. After leaving the hospital, women attended private hospitals in 47.5% and the main reasons were distance to the hospital (22.3%) and financial barrier (18.2%). The choice of place of childbirth was the private facilities in 55.4%. The determinants of loss to follow-up included age group of [20- 30[years; residing at more than 15 km from the hospital; number of antenatal contacts <4; perception on the cost of pregnancy care as being very expensive.

Conclusion: The proportion of pregnant women lost to follow up was high. Young women between 20 – 30 years, having a past history of curettage, with poor economic resources and who recorded less than four antenatal contacts were prone to interrupt follow up.

RESUME

Introduction : Une meilleure compréhension du phénomène des « pertues de vue » pourrait permettre d'améliorer le suivi et par conséquent d'atteindre les objectifs de prévention et de traitement. Le but de cette étude était de déterminer l'itinéraire et les déterminants des pertues de vue parmi les femmes enceintes suivies à l'Hôpital Gynéco-Obstétrique et Pédiatrique de Yaoundé.

Méthodologie : Nous avons mené une étude transversale analytique sur une période de 8 mois entre novembre 2019 et juin 2020. Les variables étudiées étaient les données socio-démographiques, cliniques et l'itinéraire des pertues de vue.

Résultats : Nous avons retenu 405 dossiers de patientes, dont 166 appartenant au groupe I et 239 au groupe II ; d'où le taux de pertues de vue de 41%. Après avoir quitté l'hôpital, les gestantes consultaient dans les formations sanitaires privées dans 47,5% ; les principales raisons évoquées étant l'éloignement de l'hôpital (22,3%) et les difficultés financières (18,2%). Les gestantes choisissaient de donner naissance dans 55,4% dans des formations privées. Les déterminants associés aux pertues de vue sont : appartenir à la tranche d'âge [20-30[ans, habiter à plus de 15 km de l'hôpital, avoir réalisé moins de 4 consultations prénatales et avoir la perception que le coût du suivi prénatal est très onéreux.

Conclusion : Le taux de pertues de vue des gestantes était élevé. Les patientes d'âge jeune entre 20 et 30 ans, ayant un antécédent de curetage, un pouvoir financier faible et ayant réalisé moins de quatre contacts prénatals étaient plus susceptibles d'être pertues de vue.

DOI : <https://doi.org/10.64294/jsd.v3i4.195>

Introduction

Discontinuity of care may contribute to a considerable worsening of most diseases, leading to organ damage and an increase in health care expenditure [1,2]. Loss to follow-up is a major barrier to achieving the goals of prevention and control programs, too [3]. It is an indicator of treatment effectiveness, and therefore important to explore in the domain of pregnancy follow-up. As a result, women who are lost to follow-up may have less desired health outcome than the patients who remain in care, and therefore more likely to die [4-7].

There is limited information on loss to follow-up amongst pregnant women. In Cameroon, Dohbit et al reported a 44% loss to follow-up amongst adolescent pregnant women in Yaoundé [8]. Factors associated with this were working in the informal sector, originating from the North-West region of Cameroon, long waiting period during antenatal consultation, long distance to the hospital, medical fees considered as expensive, high cost of delivery, aggressive attitude of hospital staff, having a large family size and low socio-economic status [8]. We found no study done on the entire population of pregnant women on loss to follow-up and none to know the route they take and where they ended up once they leave health facilities. Thus, we carried out this study to raise local data on the itinerary and determinants of loss to follow-up of pregnant women booked at the Yaounde Gynaeco-Obstetrics and Paediatric Hospital (YGOPH) to ameliorate maternal services.

Materials and methods

We conducted a cross-sectional analytical study covering the year 2018 at the Yaoundé Gynaeco-Obstetrics and Paediatric Hospital (YGOPH). The target population was all pregnant women attending antenatal care irrespective of their place of delivery. Patients were divided into two groups. The group 1 included women who had carried out at least one antenatal care and did not deliver in the YGOPH. And the group 2 was made up of women who completed their follow-up and delivery at the YGOPH. The minimum sample size was estimated, based on the Schlesselman formula. The sampling method was consecutive. We searched the archives of the antenatal care unit and selected appropriate cases. Once the phone numbers were identified, women were called in order to obtain verbal informed consent. Women residing in Yaoundé were given an appointment during which the consent form was signed and the interview done. For those residing out of Yaoundé, the interview was done through phone call according to their availability. At the end of the interview, the questionnaire was filled. Variables of the study were socio-demographic, clinical and itinerary related of loss to follow-up of pregnant women. Statistical analysis was done using

the software SPSS version 24. The Odds ratio with 95% confidence intervals was used to determine statistically significant risk factors. An error margin of 5% was set. Ethical approval was obtained from the Institutional Review Board of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé 1 and from the Centre Regional Ethics Committee for Human Health Research.

Results

Concerning the socio-demographic characteristics of our study population, as shown in Table I, the mean age of the study population was 29.9 ± 5.1 years (range 20-42 years). The [20 – 30[years age group was the most represented, and was significantly associated with loss to follow-up ($P < 0.001$).

Table I: Socio-demographic characteristics of study population

Variable	Total N=405 (%)	Group 1: Loss to follow-up N=166 (%)	Group 2: Complete follow-up N=239 (%)	OR (CI 95%)	P value
Mean age (years)	31.0 $\pm$ 5.3	29.9 $\pm$ 5.1	31.7 $\pm$ 5.2		
Age group (years)					
[20 – 30[	200 (49.4)	101 (60.8)	99 (41.4)	2.20 (1.5 – 3.3)	< 0.001
[30 – 45[	205 (50.6)	65 (39.2)	140 (58.6)		
Occupation					
Pupil	4 (1.0)	1 (0.6)	3 (1.3)	0.48 (0.5 – 4.6)	0.647
Student	76 (18.8)	36 (21.7)	40 (16.7)	1.38 (0.8 – 2.3)	0.244
Housewife	82 (20.2)	28 (16.9)	54 (22.6)	0.70 (0.4 – 1.2)	0.169
Jobless	14 (3.5)	8 (4.8)	6 (2.5)	1.97 (0.7 – 5.8)	0.270
Civil servant	94 (23.2)	37 (22.3)	57 (23.8)	0.92 (0.6 – 1.5)	0.811
Informal sector	70 (17.3)	34 (20.5)	36 (15.1)	1.45 (0.9 – 2.4)	0.182
Private sector	65 (16.0)	22 (13.3)	43 (18.0)	0.70 (0.4 – 1.2)	0.218
Marital status					
Married	192 (47.4)	68 (41.0)	124 (51.9)	0.64 (0.4 – 1.0)	0.034
Spinster	147 (36.3)	70 (42.2)	77 (32.2)	1.53 (1.0 – 2.3)	0.046
Cohabitation	61 (15.1)	25 (15.1)	36 (15.1)	1.0 (0.6 – 1.7)	1.000
Widow	4 (1.0)	2 (1.2)	2 (0.8)	1.45 (0.2 – 10.4)	1.000
Divorced	1 (0.2)	1 (0.6)	0 (0.0)	-	0.410
Residence (distance between house to hospital in kilometers)					
0 – 5km	263 (64.9)	101 (60.8)	162 (67.8)	0.74 (0.5 – 1.1)	0.169
5 – 10km	119 (29.4)	52 (31.3)	67 (28.0)	1.17 (0.8 – 1.8)	0.506
10 – 15km	14 (3.5)	6 (3.6)	8 (3.3)	1.08 (0.4 – 3.2)	1.000
>15km	9 (2.2)	7 (4.2)	2 (0.8)	5.21 (1.1 – 25.4)	0.036

The majority of our participants in Group 1 (lost to follow up group) were civil servants (22.3%) followed by students (21.7%). Spinsters were the mostly represented marital status (42.2%), followed by married women (41.0%). Women resided mostly at 0-5km (60.8%) from the hospital. Residing more than 15 km from the hospital was associated with an increased risk to interrupt follow-up ($P=0.036$).

Regarding the obstetrical past history of our patients (Table II), the mean parity was 2.3 ± 1.5 . A premature delivery was recorded in five patients (3%). Miscarriage was reported in 37 patients (63.8%). In addition, a past history of curettage was noticed for seven patients (4.2%). Cesarean section was the most common surgical procedure with 22 cases (13.3%) and cephalo-pelvic disproportion as the most frequent indication.

Table II: Obstetrical past history of participants

Variable	Total N=405 (%)	Group 1: Loss to follow-up N=166 (%)	Group 2: Complete follow-up N=239 (%)	OR (CI 95%)	P value
Gestivity	3.0 ± 1.8	2.9 ± 1.8	3.1 ± 1.8		
Parity	2.4 ± 1.4	2.3 ± 1.5	2.5 ± 1.5		
Premature delivery					
Yes	23 (5.7)	5 (3)	18 (7.5)	0.387 (0.1-1)	0.040
No	382 (94.3)	161 (97)	221 (92.5)		
History of abortion					
Yes	136 (33.6)	58 (34.9)	78 (32.6)	1.13 (0.6 – 2.3)	0.436
No	269 (66.4)	108 (65.1)	161 (67.4)		
Types of abortion					
Spontaneous	84 (61.8)	37 (63.8)	47 (60.3)	1.13 (0.6 – 2.3)	0.436
Induced	52 (38.2)	21 (36.2)	31 (39.7)		
Surgical past history					
Caesarean section	80 (19.8)	22 (13.3)	58 (24.3)	0.48 (0.3 – 0.8)	0.007
Curettage	9 (2.2)	7 (4.2)	2 (0.8)	5.22 (1.1 – 25.4)	0.028
Myomectomy	5 (1.2)	5 (3.0)	0 (0.0)	-	0.011
Other indications of laparotomy	4 (1.0)	0 (0.0)	4 (1.7)	-	0.120

As part of the follow up of the current pregnancy, shown on Table III, 111 out of 166 women (66.9%) started antenatal care at the YGOPH during the first trimester. Reasons related to the late start of antenatal care were: having started antenatal care in other health care facilities (49.2%), personal choice (18%) and financial barrier (16.4%). Concerning the total number of antenatal contacts, 89 out of 166 (54.3%) carried out less than four consultations

during the pregnancy.

In the lost to follow up group, as shown on Table IV, the median age of pregnancy at the last antenatal care was 28 weeks, interquartile range [20 - 34]. The majority of women stopped antenatal care during the third trimester (60.8%). Median number of antenatal consultations attended was 4, interquartile range [2 – 6.8]. Once they left the YGOPH, women mostly visited private health facilities located at the periphery in 79 out 166 cases (47.5%). It is worthy to notice that 63 out of 166 (38%) did not report any further consultation at all. The main reasons advocated for leaving the YGOPH were respectively: distance (22.3%), financial barrier (18.1%), relocation of participants out of town (13.9%), fright and frustrations induced by the health personnel (11.4%).

Out of the 166 women who were lost to follow-up, 92 (55.4%) experienced childbirth in private health facilities, 39 (23.5%) in another public health facility and 25 (15.1%) delivered out of Yaoundé. The main reasons associated with the preference of choice of place of delivery other than YGOPH were distance (36.7%), financial barrier (17.5%), women seeking to be closer to their family (9%) and women not satisfied by hospital's service (8.4%).

Table III: Follow up of current pregnancy

Variable	Total N=405 (%)	Group 1: Loss to fol- low-up N=166 (%)	Group 2: Comple- te fol- low-up N=239 (%)	OR (CI 95%)	P value
Trimester of pregnancy at first antenatal contact at YGOPH					
First trimester	273 (67.4%)	111 (66.9%)	162 (67.8%)	0.96 (0.6 – 1.5)	0.914
Second trimester	104 (25.7%)	49 (29.5%)	55 (23.0%)	1.40 (0.9 – 2.2)	0.165
Third trimester	28 (6.9%)	6 (3.6%)	22 (9.2%)	0.37 (0.1 – 0.9)	0.030
Reasons for late start of antenatal care (second or third trimester)					
Started antenatal care elsewhere	63 (47.7%)	30 (49.2%)	33 (46.5%)	1.11 (0.6 – 2.2)	0.861
Chose to start late	24 (18.2%)	11 (18.0%)	13 (18.3%)	0.98 (0.4 – 2.4)	1.000
Financial barrier	19 (14.4%)	10 (16.4%)	9 (12.7%)	1.4 (0.5 – 3.6)	0.623
Didn't want to waste time in the hospital	11 (8.3%)	6 (9.8%)	5 (7.0%)	1.44 (0.4 – 5.0)	0.754
Ignorance	8 (6.1%)	2 (3.3%)	6 (8.5%)	0.37 (0.1 – 1.9)	0.286
Seniority	7 (5.3%)	2 (3.3%)	5 (7.0%)	0.45 (0.1 – 2.4)	0.450
Total number of antenatal consultations					
[0 – 4[	122 (31.0)	89 (54.3)	33 (13.4)	7.05 (4.4- 11.4)	<0.001
[4-15[	271 (69.0)	75 (45.7)	196 (85.6)		

Table IV: Loss to follow-up evolution

Variable	Value n=166	Percentage (%)
Pregnancy age at last antenatal care		
1st trimester	12	7.2%
2nd trimester	53	31.9%
3rd trimester	101	60.9
Next place to follow up		
Public health facility	24	14.5
Private health facility	79	47.5
No further place	63	38
Place of delivery		
Private health facility	92	55.4
Another public health facility	39	23.5
In another city town in Cameroon	25	15.1
On the way to hospital	7	4.2
At home	3	1.8
Reasons advocated for leaving YGOPH		
Distance to YGOPH	37	22.3
Financial barrier	30	18.1
Relocation	23	13.9
Fright and frustration from hospital personnel	19	11.4
Not satisfied	15	9
Inadequate privacy	14	8.4
Family reasons	13	7.8
Influx of patients	13	7.8
Religious reasons against blood transfusion	2	1.2
Reasons associated with choice of place of delivery		
Distance to YGOPH	61	36.7
Financial barrier	29	17.5
Be closer to the family	15	9.0
Not satisfied by YGOPH's service	14	8.4
Bypassed scheduled caesarean section	11	6.6
Doubt on performance of the hospital personnel	10	6.0
Rumours on excessive unexplained caesarean section	9	5.4
Preference of a particular gynaecologist of YGOPH	9	5.4
Wanted to be followed-up in private health facility	8	4.8

As shown on Table V concerning familial and socio-cultural variables associated with loss to follow-up, the perception of the cost of pregnancy by participants was predominantly affordable in 93 out of 166 (56%). There was a statistically significant association between perception of cost of pregnancy being very expensive and loss to follow-up ($P=0.018$). Regarding the cost of delivery, 49 out of 166 patients

(29.5%) considered it as being affordable. This was a protective factor to loss to follow-up, with a statistical significance ($P=0.000$).

Table V: Familial and socio-cultural variables associated with loss to follow up

Variable	Total N=405 (%)	Group 1: Loss to follow-up N=166 (%)	Group 2: Complete follow-up N=239 (%)	OR (CI 95%)	P value
Perception on the cost of pregnancy care					
Cheap	14 (3.5)	6 (3.6)	8 (3.3)	1.08 (0.4-3.2)	0.548
Affordable	237 (58.5)	93 (56)	144 (60.3)	0.83 (0.6-1.2)	0.208
Expensive	108 (26.6)	41 (24.7)	67 (28)	0.86 (0.5-1.3)	0.290
Very expensive	46 (11.4)	26 (15.7)	20 (8.4)	2.03 (1.1-3.8)	0.018
Perception on the cost of delivery					
Cheap	6 (1.5)	2 (1.2)	4 (1.7)	0.72 (0.1-4.0)	0.524
Affordable	169 (41.7)	49 (29.5)	120 (50.2)	0.42 (0.3-0.6)	< 0.001
Expensive	136 (33.6)	49 (29.5)	87 (36.4)	0.73 (0.5-1.1)	0.091
Very expensive	44 (10.9)	17 (10.3)	27 (11.3)	0.90 (0.5-1.7)	0.434
No idea	50 (12.3)	49 (29.5)	1 (0.4)	99.68 (13.6-730.8)	< 0.001
Perception of reception by hospital staff					
Friendly	86 (21.2)	32 (19.3)	54 (22.6)	0.84 (0.5-1.4)	0.288
Normal	147 (36.3)	61 (36.7)	86 (36)	1.03 (0.7-1.6)	0.483
Aggressive	106 (26.2)	44 (26.5)	62 (26)	1.00 (0.6-1.6)	0.539
Bizarre	66 (16.3)	29 (17.5)	37 (15.4)	1.16 (0.7-2.0)	0.338
Level of education of head of the house					
No education	3 (0.7)	1 (0.6)	2 (0.8)	0.72 (0.1-8.0)	0.634
Primary	11 (2.7)	4 (2.4)	7 (2.9)	0.82 (0.2-2.8)	0.505
Secondary	164 (40.5)	72 (43.4)	92 (38.5)	1.22 (0.8-1.8)	0.189
Higher	227 (56.1)	89 (53.6)	138 (57.8)	0.85 (0.6-1.3)	0.235
Profession of head of the house					
Civil servant	139 (34.4)	52 (31.3)	87 (36.5)	0.80 (0.5-1.2)	0.171
Informal sector	124 (30.6)	53 (32)	71 (29.7)	1.11 (0.7-1.7)	0.356
Private sector	119 (29.4)	47 (28.3)	72 (30.1)	0.92 (0.6-1.4)	0.390
Student	10 (2.5)	8 (4.8)	2 (0.8)	6.00 (1.3-28.6)	0.014
Housewife	9 (2.2)	4 (2.4)	5 (2.1)	1.16 (0.3-4.4)	0.543
No occupation	4 (0.9)	2 (1.2)	2 (0.8)	1.45 (0.2-10.4)	0.542

On the other hand, the same figure was associated with no idea on the cost of delivery because they had left the hospital earlier before their delivery, and was significantly associated with loss to follow-up

($P=0.000$). The perception of reception by hospital staff was predominantly normal (36.7%), followed by their aggressiveness (26.5%). The level of education and profession of the head of household were respectively higher institute (53.6%) and working in the informal sector (32%). In addition, having a student as profession of the head of the family was found in eight cases and was associated with loss to follow up.

After multivariate analysis, factors found to be associated with loss to follow up were the followings: age group between [20 – 30[years, number of antenatal contacts done less than four, having a past history of curettage and having a student as head of household.

Discussion

Sociodemographic characteristics associated with “loss to follow-up”

Few studies have addressed the problem of loss to follow-up amongst pregnant women. Our study showed that 41% of pregnant women were lost to follow-up. This result was close to that of Dohbit et al. who came-up with 44% in a similar study conducted in 2017, in Yaoundé -Cameroon [8]. However, the result is much higher than that of Marete et al, where the proportion of loss to follow-up was 1.7% in a prospective multi-centric study [9]. This difference can be explained by the fact that in latter survey, various techniques were employed to ensure retention of mothers in the registry. For example, some teams engaged traditional birth attendants to complete follow-up visit at home before and after delivery.

The mean age of women was 29.9 years (± 5.1). The [20 – 30[years age group was significantly associated with loss to follow-up (OR= 2.19, 95% CI= 1.5-3.3, $P < 0.001$) thus younger women were more likely to leave the hospital as compared to older women. This can be explained by the fact that older patients tend to have a more settled lifestyle, making it easier to incorporate hospital attendance for follow-up, whereas younger people had to move closer to the family for proper care after delivery and/or relocate to; seek employment, further studies or get married. Marete et al. had similar findings in 2015 with mothers of less than 20 years having a high risk of interrupting follow-up (RR= 1.2, 95% CI= 1.1, 1.3) [9].

Women's matrimonial status especially being single and married were significantly associated with loss to follow-up. The married women had a lesser tendency of leaving the hospital (OR 0.64, CI 95% 0.4-1.0, $P=0.034$) whereas spinsters tended to discontinue follow-up (OR 1.53, CI 95% 1.0-2.3, $P=0.046$). Married women, we believe have more financial, moral and physical support from their husbands, while single women are left to themselves and have to come up with all the necessary provisions,

making them prone to become discourage. This is also seen in other studies on loss to follow-up where single women lack family support influencing them to discontinue follow-up [10, 11].

Residing at more than 15 km from the hospital influenced women to discontinue follow-up. This finding is in agreement with that of Tollegbe et al. in 2004, in a descriptive study to explain the discontinuity of obstetrical care in Africa. They found that women living at more than 15km from the health facility were 5 times more likely to interrupt follow-up [12]. This could be explained by the fact that women leaving in distant quarters encounter challenges with high transportation costs and road traffic jams, making it more difficult for them to meet-up with their consultations. So, even though these women came from out of town and desired to experience antenatal and delivery care at the YGOPH, unfortunately, they had to drop.

Itinerary of women who were “lost to follow-up”

A patient tracer is an effective way to determine the final status of lost patients. Most women in our series headed to private healthcare facilities (47.5%), 38% did not continue follow-up and 14.5% continued in public facilities. This difference in proportion could be explained by the fact that they evaluated women's perception and satisfaction of antenatal care in the private and public facilities. Whereas we tried to know the route taken by women once, they left our center.

The major complains women made about the YGOPH and the reasons attached to this preference for private health facilities in our study were: great distance from the women's residence making it difficult for them to arrive to the hospital on time to secure a good position (21.7%), financial barrier related to paraclinical investigations and delivery caution fees considered heavy (18.1%), relocation of women either family reasons or in search for settled life (13.9%). Others were fear of unjustified caesarean section and frustration from impolite attitude of nurses mostly when vital signs are taken (11.4%) and dissatisfaction of women on the absence of gynaecologists (10.2%), who are replaced by residents a different one at each consultation, inadequate confidentiality and poor communication with care providers. This contrast those of Isatou et al. in Gambia in 2012 where satisfaction rate with antenatal services in private facilities was higher (97.9%) [13]. In a study on exploring the reasons for loss to follow-up in pregnancy of unknown location, Flynn et al found that barriers to follow-up were the long duration of management, general inconvenience and poor communication with their health care team [14]

A large proportion of women sought to deliver in private facilities (55.4%) followed by public health facilities (23.5%). This growing preference as identified in

our study for private clinic was observed in a recent review conducted by Thecla et al., Tanzania in 2018 [15]. In contrast, in a study by Khumukcham et al. in India the preference for public hospitals was high [16].

The reasons for this choice of place of birth to the detriment of the YGOPH included: the distance to the hospital, as women opted to deliver in nearby private clinics. Financial challenges impacting their decisions; it was noticed that the cost of delivery relatively differ in different private hospitals where rich women visited high standing while those with low income delivered in low graded clinics [17]. Most women leaving alone as students sort to deliver closer to the family to benefit from proper family support.

The religious reasons for interrupting follow-up were women not going for blood transfusion in 1.2%. Christians belonging to the Jehovah Witness faith usually refuse blood transfusion even when it is indicated [18]. This induced the discontinuity of care for some pregnant women who were programmed for caesarean section and were told to reserve blood for eventual transfusion.

Clinical and reproductive variables associated with “loss to follow-up”

A past history of premature delivery was significantly associated with loss to follow-up (OR= 0.38, 95% CI = 0.1-1.0, P=0.040). Women with premature delivery were less likely to end follow-up probably due to the fear of having premature delivery again. Having fewer antenatal contacts (less than 4 contacts) was associated with loss to follow-up (OR= 7.05, 95% CI= 4.4-11.4, P<0.001). Tollegbe et al. outlined the proportions of discontinuity of obstetric care according to the number of antenatal consultations in different countries. He reported that in Cameroon, having less than four antenatal contacts was associated with 40.8% of loss to follow-up whereas having more than four antenatal contacts was associated with 23.3% of loss to follow-up [12]. Yet this cannot be applied to our study because some women started antenatal care elsewhere before booking for antenatal contacts at YGOPH and some others continued elsewhere after leaving YGOPH.

Women with a past history of caesarean section were less likely to stop antenatal contacts at the hospital (OR= 0.48; 95% CI= 0.3-0.8; P=0.007) this is because most of them considered the YGOPH as a one with a high level of care required for high-risk cases.

Socio-cultural and economic factors associated with “loss to follow-up”

We found an association between loss to follow-up and the perception of the cost of delivery as affordable (OR= 0.42; 95%CI=0.3-0.6; P < 0.001). This contrast with the findings of Dohbit et al. in a similar study in 2017 where women’s perception of delivery fees was

very expensive (OR= 16.23; 95% CI= 4.2-104.3; P < 0.001) [8]. This difference can be explained in that, in our series women who perceived delivery fees as affordable were less likely to discontinue follow-up while those having no idea had left earlier simply because of financial constraints. However, there was a similarity with the findings of Dohbit et al. on the perception of pregnancy cost to be very expensive and this was statistically significant with a high risk of discontinuity [8]. This similarity is mostly due to the bulky cost of laboratory investigations.

In Cameroon, a prospective cohort study conducted by Sidze et al. in 2015 on factors associated with loss to follow-up in HIV, found that paternal and maternal socio-professional activities are associated with loss to follow-up [19]. This is similar to our study where being a student and head of the household was a factor associated with loss to follow-up. This can be due to the fact that students have less financial resources and time to take care of the family needs.

Conclusion

The proportion of pregnant women lost to follow-up is very high. Close to half of these pregnant women after leaving YGOPH, revert to private health facility and the place of childbirth is a private hospital in 55.4%. Young women between 20 – 30 years, having a past history of curettage, with poor economic resources and who recorded less than four antenatal contacts are prone to interrupt follow up.

Conflict of interest: The authors declare that the research was conducted in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

Author’s contributions: Fouda Awona EN wrote the first draft. Nyada Sr, Ebong Ebontane C, Tompeen I, Batoum Mboua V and Nsahlai C were co-investigators. Dohbit Sama J and Foumane P were supervisors of the study. All authors reviewed the final manuscript.

References

1. Van Cutsem G, Ford N, Hildebrand K, Goemaere E, Mathee S, Abrahams M et al. Correcting for mortality among patients lost to follow-up on antiretroviral therapy in South-Africa: a cohort analysis. PLoS ONE. 2011; 6(2): e14684. doi:10.1371/journal.pone.0014684.
2. Osterberg L, Blaschke T. Adherence to medication. N Engl J Med 2005; 353: 487-97
3. Amitoj G, Rohit G, Shruti b, Rohul G, Gurkirat G, Joseph A et al. Loss to follow-up among cancer survivors. Amer J of Clinical Onco. 2018; 41(10):1024-1027.
4. De klerk E, Van der Heijde D, Landewe, Van der Tempel H, Urquhart J, Van der Linden S. Patient compliance in rheumatoid arthritis, polymyalgia rheumatic, and gout J Rheumatol. 2003; 30: 44-54.
5. Humphrey J, Kipchumba B, Alera M, Sang E, Musick B, Muli L et al. Outcomes after loss to follow-up for pregnant and postpartum women living with HIV and their children in Kenya: a prospective cohort study. JAIDS. 2024; 97(3):242-252. doi: 10.1097/QAI.0000000000003487.

6. Kelly-Hanku A, Nightingale CE, Pham MD, Mek A, Homiehombo P, Bagita M et al. Loss to follow up of pregnant women with HIV and infant HIV outcomes in the prevention of maternal to child transmission of HIV programme in two highburden provinces in Papua New Guinea: a retrospective clinical audit. *BMJ Open*. 2020 ; 10:e038311. doi:10.1136/ bmjopen-2020-038311.
7. Azanaw MM, Baraki AG, Yenit MK. Incidence and predictors of loss to follow-up among pregnant and lactating women in the Option B+ PMTCT program in Northwestern Ethiopia: a seven-year retrospective cohort study. *Front. Glob. Womens Health*. 2023; 4:1128988. doi: 10.3389/ fgwh.2023.1128988.
8. Dohbit SJ, Meka NU, Mve KV, Bogne JB, Foumane P, Bolo S. et al. High loss to follow-up of adolescent pregnancies in Yaoundé. What are their determinants and challenges? *J Gynecol Obstet Forecast*. 2018; 1(2): 1008.
9. Marete I, Tenge C, Chemweno C, Bucher S, Pasha O, Ramadurg UY et al.: Lost to follow-up among pregnant women in a multi-site community based maternal and newborn health registry: a prospective study. *Reproductive Health*. 2015; 12(Suppl 2):S4. doi:10.1186/1742-4755-12-S2-S4.
10. Foocharoen, Chingching MD, Yenrom, Patinut MD, Mahakkanukrauh, Ajanee MD, Suwannaroj et al. Prevalence and causes of loss to follow-up among patients with systemic sclerosis. *J Clin Rheumatol*. 2014; 20(8):456 doi: 10.1097/RHU.0000000000000198.
11. Kalinjuma, Aneth V, Glass, Tracy R, Weisser, Maja, Myeya et al. Prospective assessment of loss to follow-up: incidence and associated factors in a cohort of HIV-positive adults in rural Tanzania. *J Int AIDS Soc*. 2020; 23:e25460.
12. Tollegbe A: Les facteurs explicatifs de la discontinuité des soins obstétricaux en Afrique: cas du Bénin [mémoire professionnel d'études supérieures spécialisées en démographie]. Yaoundé: Institut de formation et de recherche démographiques. Institut; 2004. 61P.
13. Isatou K, Jallow, Ying-Jeng C, Tsai-Ling L, Nicole H. Women's perception of antenatal care services in public and private clinics in the Gambia. *Int J Qual Health Care*. 2012; 24(6):595–600.
14. Flynn AN, Mc Allister A, Jen A, Gutman S, Allen A, Kete C et al. Exploring reasons for loss to follow-up in pregnancy of unknown location: a mixed methods study. *J Womens Health*. 2025; 34(1). doi.org/10.1089/jwh.2023.1146.
15. Thecla W. Kohi1, Lilian T. Mselle, Justine Dol and Megan Aston. When, where and who? Accessing health facility delivery care from the perspective of women and men in Tanzania: a qualitative study. *BMC Health Services Research*. 2018; 18:564.
16. Khumukcham T, Singh T, Kaur M, Gupta M, Kumar R. Factors Influencing the Choice of a Public or Private Health Institution for Childbirth in Chandigarh. *Indian J Comm Health*. 2015; 27, 1: 86-94.
17. World Health Organisation. Making Pregnancy Safer country profiles [online database]. Geneva, 2004.
18. Jehovah Witnesses: Official Statement to the Media on Blood Transfusion. CESNUR. June 15, 2000.
19. Larissa KS, Albert F, Suzie NT, Ida P, Georgette G, Francis NA et al. Different factors associated with loss to follow-up of infants born to HIV-infected or uninfected mothers: observations from the ANRS 12140-PEDIACAM study in Cameroon. *BMC Public Health*. 2015; 15: 228.



Indications and Findings of Pediatric Chest X-Rays in a Secondary Referral Hospital in Cameroon

Indications et résultats de la radiographie thoracique chez les enfants à l'Hôpital Régional de Buea

Dongmo Fomekong S.^{1,2}, Moulion Tapouh J.R.³, Fokam Puepi Y.^{1,2}, Tambe J.^{1,2}, Onana Y.R.⁴, Oteh Njockawoh M.¹, Tsague S.M.¹, Moifo B.^{5,6}, Zeh O.F.^{5,6}

Original Article

1. Faculty of Health Sciences, University of Buea (Buea, Cameroon)
2. Regional Hospital of Buea (Buea, Cameroon)
3. Faculté de Médecine et des Sciences Pharmaceutiques, Université de Dschang (Dschang, Cameroon)
4. Faculté de Médecine et des Sciences Biomédicales de Garoua, Université de Garoua (Garoua, Cameroon)
5. Faculté de Médecine et des Sciences Biomédicales, Université de Yaoundé I (Yaounde, Cameroon)
6. Hôpital Gynéco-Obstétrique et Pédiatrique de Ngousso (Yaounde, Cameroon)

Auteur correspondant : Dongmo Fomekong Sylviane, Hôpital Régional de Buea, dongfosyl@yahoo.fr, +237 699077121

Keywords: Chest radiography, Indications, Results, Cameroon, Buea Regional Hospital

Mots clés : Radiographie du thorax, Indications, Résultats, Cameroun, Hôpital Régional de Buea

Date de soumission: 24/08/2025
Date d'acceptation: 01/12/2025

ABSTRACT

Background: Chest radiography (CXR) remains a frontline imaging modality for evaluating thoracic pathology in children. However, international guidelines advise against its use in uncomplicated respiratory conditions, citing limited diagnostic value and risks from ionizing radiation. The aim of our study was to describe the indications and findings of pediatric chest radiography at Buea Regional Hospital (BRH), Cameroon.

Methods: A retrospective study was conducted over 18 months (January 2021–June 2022) using imaging department records. Data were collected for children aged 0–15 years who underwent chest radiography, excluding cases without radiologist interpretation. Sociodemographic characteristics, indications, and radiographic findings were analyzed descriptively.

Results: A total of 111 pediatric CXRs were reviewed. Males accounted for 56%, with a mean age of 4.3 years; infants aged 1 month to 1 year were most represented (37.8%). General practitioners and pediatricians requested most CXRs (47.3% and 45.5% respectively). Indications were not mentioned in 19.8% of cases. Among documented indications, cough (18.9%), cough with fever (15.3%), and suspected pneumonia (15.3%) were predominant. Overall, 35.1% of CXRs were normal. Bronchiolitis (33.3%) and pneumonia (19.8%) were the leading findings. In neonates, 66.7% of CXRs were normal.

Conclusion: These results highlight the importance of justified indications for CXRs to avoid unnecessary radiation exposure, especially in neonates and infants. This therefore raises the question of the relevance and necessity of applying the principles of radioprotection, particularly the principle of justification of procedures.

RESUME

Introduction : La radiographie du thorax (RT) reste une modalité d'imagerie de première ligne pour l'évaluation des pathologies thoraciques de l'enfant. Toutefois, les recommandations internationales déconseillent son utilisation dans les affections respiratoires non compliquées, en raison de sa valeur diagnostique limitée et des risques liés aux rayonnements ionisants. Le but de notre étude était de décrire les indications et les résultats des radiographies thoraciques pédiatriques à l'Hôpital Régional de Buea (HRB), Cameroun.

Méthodes : Une étude rétrospective a été menée sur une période de 18 mois (janvier 2021 – juin 2022). Les données ont été recueillies pour les enfants âgés de 0 à 15 ans ayant bénéficié d'une RT. Les caractéristiques sociodémographiques, les indications et les résultats radiographiques ont été analysés de manière descriptive.

Résultats : Au total, 111 radiographies thoraciques ont été examinées. Les garçons représentaient 56 % des cas, avec un âge moyen de 4,3 ans ; les nourrissons âgés de 1 mois à 1 an étaient les plus représentés (37,8 %). Les indications n'étaient pas mentionnées dans 19,8 % des cas. Les indications les plus fréquentes étaient la toux (18,9 %), la toux avec fièvre (15,3 %) et la suspicion de pneumonie (15,3 %). 35,1 % des RT étaient normales. La bronchiolite (33,3 %) et la pneumonie (19,8 %) étaient les principales anomalies observées.

Conclusion : Ces résultats soulignent l'importance de la justification des indications des radiographies thoraciques de l'enfant afin d'éviter une exposition inutile aux rayonnements ionisants, en particulier chez les nouveau-nés et les nourrissons.

DOI : <https://doi.org/10.64294/jsd.v3i4.196>

Introduction

Chest Radiography or chest X-ray (CXR) remains the first-line examination for any thoracic pathology in children. Despite the advent of modern techniques such as Ultrasound, Computer Tomography (CT), Magnetic Resonance Imaging (MRI) and Scintigraphy, chest X-ray remains a frontline examination in this field [1]. Its accessibility, affordability, and diagnostic utility make it indispensable for evaluating thoracic pathology in children. There is an extensive range of CXR indications for children, mainly unexplained fever, cough and fever, chest pain, difficulty in breathing and it is often sufficient to establish a diagnosis, especially in low to middle incomes countries with limited resources [2,3]. But there are many cases for which it is not relevant according to international recommendations. For example, in case of uncomplicated asthma, bronchiolitis, uncomplicated pneumonia, first episode of wheezing in infants, it is advice to avoid CXR [4,5]. Most of the time it does not add value to the clinical diagnosis, can lead to an incorrect diagnosis (considering the challenges in interpreting children CXR), unnecessary antibiotic prescription and additional costs [6]. And more important, it is a source of radiation exposure in children, who are more radiosensitive. Given the risk of exposure to ionizing radiation associated with this procedure, the benefit for this should outweigh the risk, following the radioprotection principles of justification [7].

Despite its diagnostic value, studies have shown that chest radiographs are often requested without clear clinical indications, leading to unnecessary radiation exposure [8–10]. This is especially concerning in neonatal and infant populations, where imaging challenges (such as motion artifacts and poor cooperation) can compromise image quality and diagnostic yield [11,12]. In Cameroon, and specifically at the Buea Regional Hospital (BRH), chest radiography is routinely employed to investigate respiratory and cardiac symptoms in children. However, there is limited data on the appropriateness of indications and the diagnostic outcomes of these procedures. This study aims to describe the indications and findings of pediatric chest radiography in a limited-resource setting, at Buea Regional Hospital.

Materials and Methods

We carried a retrospective study at Buea Regional Hospital (BRH) during a period of 18 months from January 2021 to June 2022, using records of the imaging department registers. BRH is a secondary health facility and a main referral hospital in the Southwest Region of Cameroon. The hospital is made up of four major departments, which include: Pediatrics, Internal Medicine, Surgery and Obstetrics, and Gynecology (OBGYN). The hospital

also has specialized centers such as the Dialysis Center, Intensive Care Unit (ICU), Ophthalmology Unit, Dentistry, Medical Imaging, Neonatology, and kangaroo Mother Care (KMC) units. The technical staff at the Medical Imaging Center is composed of three radiologists, seven imaging technicians and sonographers and two biological engineers. The pediatric unit is made up of 2 pediatricians and 3 general practitioners. Information's on CXR of children aged 0 to 15 years from imaging unit registers were included in the study. Chest x-rays without radiologist interpretation were excluded. Data on sociodemographic characteristics, indications and results of chest x-rays were collected using a data extraction form. Data were verified, entered into the data collection form designed on Kobo Collect and exported to excel 2016 for cleaning and analysis. Information's were coded to ensure confidentiality. Categorical variables were presented as frequencies and percentages; quantitative variables as means with standard deviation (SD).

Results

A total of 111 CXR of children aged 0 to 15 years were included in this study, with predominance of male in 62 cases (56%) with a sex-ratio of 1.27. The most represented age group was of 1month-1year with 42 cases (37.8%), with a mean age of 4.3 years (figure 1).

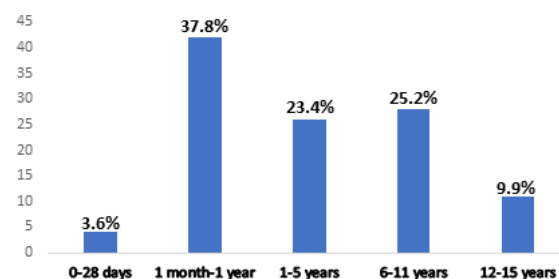


Figure 1: distribution according to age

Out of the 111 CXR requested, 52 (47.3%) were requested by a general practitioner and 50 (45.5%) by a pediatrician (figure 2).

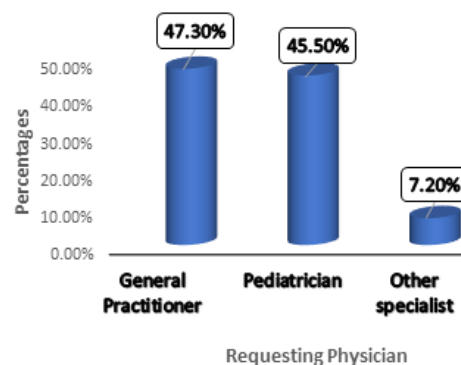


Figure 2: Chest X-ray distribution according to requesting physician

In most of the cases, the indication for the CXR was not mentioned 22 (19.83%). For the mentioned indications, cough (18.93%), cough associated with fever (15.32%) and suspicion of pneumonia (15.32%) were predominant (Figure 3).

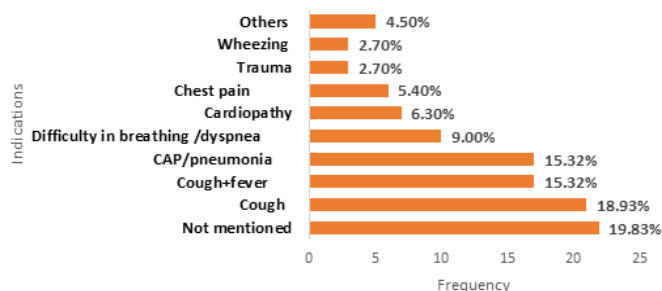


Figure 3: indications for chest X-ray

More than third of the CXR were normal 39 (35.14%). The main radiologic findings were bronchiolitis 37 (33.33%) and pneumonia 22 (19.82%) as shown on figure 4. CXR findings in neonates were normal in 66.7% of cases. Among infants the main finding was bronchiolitis.

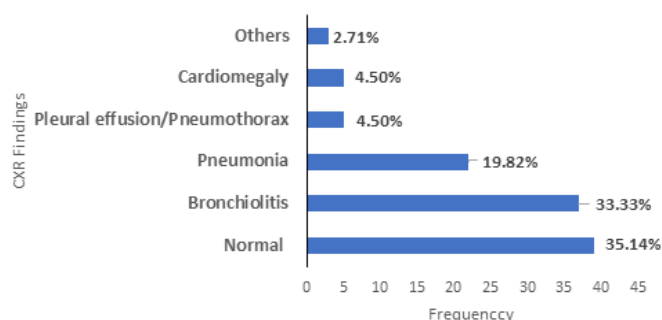


Figure 4: Chest X-ray findings

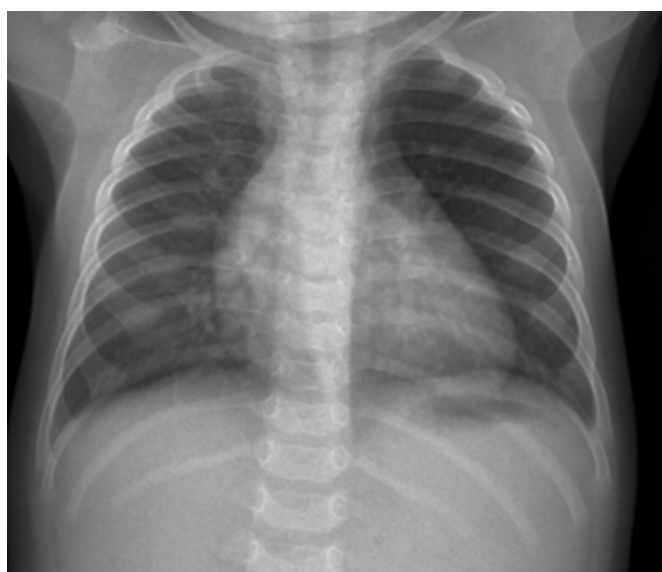


Figure 5: Chest X-ray of an Infant of 4 months, antero-posterior projection, showing diffuse bronchi walls thickening in favor of bronchiolitis. The heart is normal in shape and size. The pleural cavity is free

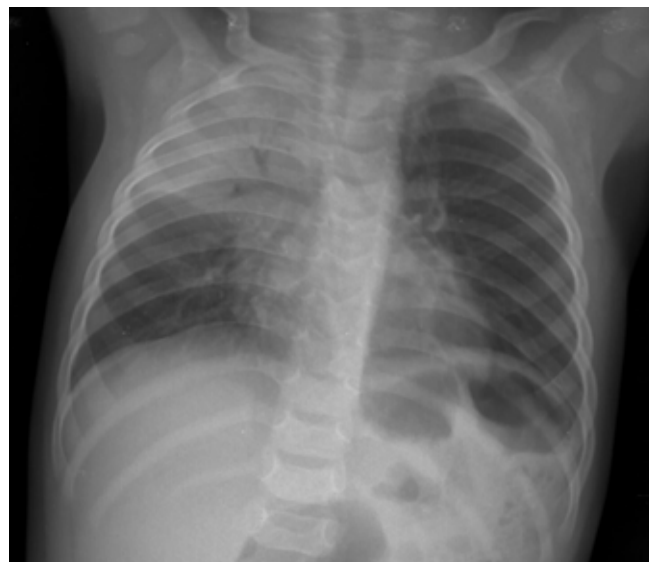


Figure 6: Chest X-ray of an Infant of 11 months, antero-posterior projection, showing a right upper lobe opacity, confluent, with well-defined margins and air bronchogram. The heart shape and size are normal. There is no pleural effusion.
Diagnosis: right upper lobe pneumonia

Discussion

This study explored the indications and findings of pediatric chest radiography at the Buea Regional Hospital (BRH), highlighting both clinical trends and radioprotection concerns. The findings reveal that chest X-rays (CXR) are frequently requested for children presenting with respiratory symptoms, particularly cough, fever, and suspected pneumonia. These results align with global patterns, where respiratory tract infections remain the leading cause of pediatric imaging requests.

Demographic characteristics and referring physician

The study included 111 chest X-rays of patients aged one day to 15 years. The male gender was predominant in 56% of cases. Infants of one month to one year were the most represented (37.8%). These findings are similar to those of a study carry out in Ngaoundere in 2018, where males and infants (32.1%) were most represented[3]. The majority of chest radiographs were requested by pediatricians (47.3%) and general practitioners (45.5%), which reflects the structure of BRH, where these group of physicians are often the first point of contact for children, at emergency unit and outpatient department. While for pediatricians there should be high level of clinical suspicion and diagnostic rigor, it might be the case for general practitioners.

Indications for Chest X-ray

Cough was the most frequent indication (18.93%), followed by cough with fever (15.32%) and pneumonia (15.32%). Neossi et al found also cough as the main indication (22.1%)[3]. These findings are not consistent with those reported by Morgan et al.[13],

who identified respiratory tract infections, suspected foreign body aspiration, and congenital anomalies as common indications for pediatric chest radiography. This highlights the fact that in BRH, physician mainly use symptoms as CXR indications. Cough represents a major physiological reaction to airway irritation and attempts to defend the respiratory tract by clearing it from irritant agents and extra mucous[14]. It is a common symptom among children, accounting for many outpatient visits, and affecting the quality of life of both children and their families. Generally, cough is a self-limiting symptom since among healthy children it is most often induced by respiratory tract infections triggered by viral, bacterial, and fungal airway pathogens[14,15]. In neonates, cyanosis and suspected congenital heart disease were prominent indications (33.33%), underscoring the importance of early cardiac screening in this age group. Most neonatal lung disorders can be diagnosed and managed with radiographs alone. But in some cases, like congenital lung malformations and cardiovascular abnormalities, cross-sectional imaging may provide essential additional clinical information, chest ultrasound and/or CT may be indicated[16,17].

However, the study also revealed that a significant proportion of chest X-rays were performed without documented clinical indications (19.83%). This raises concerns about adherence to radioprotection principles, particularly the principle of justification, which mandates that every imaging procedure must be clinically warranted[18]. Studies carried out in Yaounde, Cameroon, revealed unsatisfactory level of knowledge of referring physicians regarding justification of ionizing examinations[19,20]. Proposed solutions are education during medical studies and continuous education in hospitals on radiation protection, alongside with elaboration of imaging referral guidelines, clinical audit and regulation[19].

Radiographic findings

Among the 111 chest X-rays records reviewed, 37 (33.33%) showed bronchiolitis (bronchial syndrome or thickening of bronchial walls), 22 (19.82%) revealed pneumonia, and 39 (35.14%) were normal. The relatively high rate of normal findings suggests that some imaging requests may have been precautionary rather than diagnostic. This is consistent with literature indicating that uncomplicated bronchiolitis and acute bronchitis are not indications for chest radiography, as per the French Haute Autorité de Santé (HAS) guidelines[10]. Many studies and guidelines described chest X-ray as not recommended in case of uncomplicated bronchiolitis, asthma, pneumonia or first wheezing syndrome, since it might lead to an incorrect diagnosis, unnecessary antibiotic prescription, additional costs, and an increased length of stay in the hospital[4,6,8,21,22]. However, the overlap in radiographic features between viral

and bacterial infections can complicate interpretation, especially in young children with atypical presentations. In such cases, chest radiography remains a valuable tool for evaluating the aetiology of fever without a focus, particularly in cases of hyperleukocytosis [23]. Although radiographs are not recommended for typical cases, CXR may help guide further investigations and management, especially in case of children with underlying respiratory/cardiac disease, a history of prematurity, significant hypoxia, focal abnormalities or severe respiratory distress [6].

Radioprotection and clinical implications

This study highlights a critical issue: the potential overuse of chest radiography in pediatric populations. Reducing radiation exposure in pediatric medical imaging is crucial due to children's heightened sensitivity to ionizing radiation and their longer life expectancy, which increases the risk of long-term effects [24]. Given the risks associated with ionizing radiation in children there is an urgent need to reinforce radioprotection protocols in resource-limited setting, emphasizing on justification and optimization respecting the principle of ALARA (As Low As Reasonably Achievable). This includes to ensure clear clinical indications before imaging. The education of clinicians and families on appropriate use of radiography [18]. the implementing decision-support tools to guide imaging requests (Imaging referral guidelines). the using digital radiography [25]. Training imaging technologists to protocol optimization: by tailoring imaging protocols based on the child's age, size, and clinical need and using the lowest effective dose that still provides diagnostic-quality images [24]. The use of non-ionizing modalities such as ultrasound and MRI when appropriate [17]. The integration of artificial Intelligence (AI) algorithms to help detect abnormalities more accurately, reducing the need for repeat scans [25,26].

In resource-limited settings like BRH, where advanced imaging modalities may not be available, chest radiography remains a cornerstone of pediatric diagnostics. However, its use must be balanced against the risks, particularly in neonates and infants who are most vulnerable to radiation effects.

Conclusion

The main reasons for chest X-rays at Buea Regional Hospital are cough and suspected pneumonia. More than a third of the X-rays performed are normal. The most frequently observed pathologies are bronchial syndrome and pneumonia. These results highlight the importance of correct indications for CXR, as incorrect or inadequate indications lead to unnecessary exposure of children to ionizing radiation, particularly newborns and infants. This therefore raises the question of the relevance and necessity of applying the principles of radioprotection, particularly the principle of justification of procedures.

Conflict of interest: The authors declare no conflict of interest

Authors contribution: DFS, MTJR and FPY gave the topic idea, drafted the data extraction form and collected data. DFS and ONM analyzed data. DFS, MTJR and TSM drafted the manuscript. TJ, OYR, FPY and TSM helped reviewing the manuscript. BM and ZOF corrected the final version of the manuscript. All the authors agree with the final version.

References

1. Chateil J-F., Durand C., Diard F. Radiographie normale de face et de profil du thorax chez l'enfant. EMC-Radiologie 2 (2005) 587-616
2. Martin L., Naccache R., Coze S., Desvignes C. and Paniel M. Radiographie thoracique de l'enfant: règles d'interprétation. Journal d'imagerie diagnostique et interventionnelle. 2017; 1:S50-S56
3. Neossi, M.G. and Alapha, F.Z. Pertinence of Children's Chest X-Ray Request Form and Practice at the Regional Hospital of Ngaoundere Cameroon. Open Journal of Radiology. 2018; 8, 223-235. doi.org/10.4236/ojrad.2018.84026
4. Frazier SB, Walls C, Jain S, et al. Reducing Chest Radiographs in Bronchiolitis Through High Reliability Interventions. Pediatrics. 2021;148(3):e2020014597
5. Andronikou S., Lambert E., Halton J., Hilder L. et al. Guidelines for the use of chest radiographs in community acquired pneumonia in children and adolescent. Pediatr Radiol (2017) 47:1405–1411. DOI 10.1007/s00247-017-3944-4
6. Hibberd O. Choosing Wisely - Radiographs in children with respiratory symptoms. Don't Forget Bubbles [Internet]. 2023 Aug 30 [cited 2025 Aug 17]; Available from: <https://dontforgetthebubbles.com/choosing-wisely-radiographs-in-children-with-respiratory-symptoms/>
7. Sirinelli D, Dousteysier MC, Aubry JC. Radioprotection chez l'enfant : comment optimiser les doses en radiologie conventionnelle. J Radiol. 2004 Sep 1;85(9):1248.
8. Lawrence J., Hiscock H., Voskoboynik A., Walpola R. and Sharma A. Reducing unwarranted chest x-rays in bronchiolitis: Importance of a robust analysis. Journal of Paediatrics and Child Health 60 (2024) 100–106.
9. Moulion TJR., Bitjong NG., Ouogue TFX., Dongmo FS., Samba NO.. and Moifo B. Evaluation of entrance surface dose and justification of pediatrics chest radiography in three university-affiliated hospitals at Yaounde-Cameroon. Journal Africain d'Imagerie Médicale 2022; 14(3):183-192.
10. HAS. Principales indications et non-indications de la radiographie du thorax – Rapport d'évaluation technologique. Février 2009.
11. Nahangi H. and Chaparian A. Assessment of radiation risk to pediatric patients undergoing conventional X-ray examinations. Radioprotection 50(1), 19-25 (2015). DOI: 10.1051/radiopro/2014023 .
12. Ducou le pointe H, Sileo C, Blondiaux E. Les pièges de la radiologie du thorax Radio thorax, pièges. E.P.U. de l'hôpital Armand Trousseau.
13. Morgan H, Pettet G, Reed M and Paul SP. Indications for chest X-rays in children and how to obtain and interpret them. Nurs Child Young People. 2018 Nov 8;30(6):30–7.
14. Mastorilli C, Serio C, Bizzoco F, et al. Management of cough in children. Italian Journal of Pediatric Allergy and Immunology 2024;38(02):10-13. <https://doi.org/10.53151/2531-3916/2024-501>.
15. Kasi AS and Kamerman-Kretzmer RJ. Cough. Pediatrics in Review. April 2019. 40(4):157-167.
16. Lobo L and Antunes D. Chest CT in infants and children. Eur J Radiol. 2013 Jul;82(7):1108–17.
17. Musolino AM, Tomà P, De Rose C, Pitaro E, Boccuzzi E et al. Ten Years of Pediatric Lung Ultrasound: A Narrative Review. Front. Physiol. 2022. 12:721951. doi: 10.3389/fphys.2021.721951
18. WHO. Communicating radiation risks in paediatric imaging: information to support health care discussions about benefit and risk. 2016. ISBN 978 92 4 151034 9.
19. Moifo, B., et al. Referring Physicians' Knowledge on Justification of Medical Exposure in Diagnostic Imaging in a Sub-Saharan African Country, Cameroon. Open Journal of Radiology. 2014. 4, 60-68. <http://dx.doi.org/10.4236/ojrad.2014..pdf>.
20. Boniface M, Tene U, Moulion JR, Samba NO, Youta JT et al. Knowledge on Irradiation, Medical Imaging Prescriptions, and Clinical Imaging Referral Guidelines among Physicians in a Sub-Saharan African Country (Cameroon). Radiology Research and Practice Volume 2017, Article ID 1245236, 7 pages <https://doi.org/10.1155/2017/1245236>.
21. Lashkarbolouk N, Ebrahimi M, Mazandarani M, Roshandel G. Evaluation of Chest Radiographic Findings in Patients with Asthma Admitted to Taleghani Hospital in Gorgan, Iran. Ped Health Res. 2022. 7:28
22. Mvalo T, McCollum ED, Fitzgerald E, Kamthunzi P, Schmicker RH et al. Chest radiography in children aged 2–59 months enrolled in the Innovative Treatments in Pneumonia (ITIP) project in Lilongwe Malawi: a secondary analysis. BMC Pediatrics (2022) 22:31 <https://doi.org/10.1186/s12887-021-03091-3> pdf.
23. Bourayou R, Zenkhri F, Pariente D et Koné-Paut I. Quel est l'intérêt de la radiographie du thorax dans le diagnostic d'une pneumonie de l'enfant en 2011 ? Arch Pédiatrie. 2011 Nov 1;18(11):1251–4.
24. Alzen G, Benz-Bohm G: Radiation protection in pediatric radiology. Dtsch Arztebl Int 2011; 108(24): 407–14. DOI: 10.3238/arztebl.2011.0407
25. Al Ameer A. Advancements in pediatric imaging: A review of techniques for reducing radiation exposure. International Journal of Health Sciences, 2024. 8(S1), 1165-1175. <https://doi.org/10.53730/ijhs.v1nS1.15140>
26. Al Talhi SH. Advancements in pediatric imaging: a review of techniques for reducing radiation exposure. Journal of Population Therapeutics & Clinical Pharmacology. Vol.29 No.4 (2022): JPTCP (3514-3518).



Maternal Mortality Audits at the Yaoundé University Teaching Hospital in Cameroon between 2017 and 2023: Findings and Quality Improvement Perspectives

Audits de mortalité maternelle au Centre hospitalier universitaire de Yaoundé (Cameroun) entre 2017 et 2023 : enseignements tirés et pistes d'amélioration de la qualité

Mboua Batoum VS^{1,2}, Christiane Nsahlaï Jivir Fomu^{2,3}, Mpono P^{2,4}, Ngo Dingom M⁵, Touangnou-Chamba SA⁵, Mve Koh V^{1,2}, Nkwabong E^{1,2}, Meka Ngo Um E^{2,6}, Essiben F^{2,5}

Original Article

1. Yaoundé University Teaching Hospital, Cameroon.
2. Department of Gynaecology and Obstetrics, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Cameroon.
3. Essos Hospital Centre, Yaounde, Cameroon
4. Hospital Centre for Research and Application in Endoscopic Surgery and Human Reproduction, Cameroon.
5. Yaoundé Central Hospital, Cameroon.
6. Yaoundé Gynaecology, Obstetrics and Paediatrics Hospital, Cameroon.

Corresponding author:

Véronique Mboua Batoum,
Yaoundé University Teaching Hospital, PO Box 35477,
Yaounde, Cameroon. Email:
vbatoum@gmail.com

Key words: maternal mortality, clinical audit, postpartum, hemorrhage, Cameroon, obstetric care.

Mots clés : mortalité maternelle, audit clinique, post-partum, hémorragie, Cameroun, soins obstétricaux

Date de soumission: 17/08/2025

Date d'acceptation: 10/12/2025

ABSTRACT

Introduction: Maternal mortality remains a major public health challenge in Cameroon. This study aimed to analyze maternal death audits conducted at the Yaoundé University Hospital to identify causes, preventable factors, and avenues for improving obstetric care.

Method: This was a retrospective and descriptive study of 16 cases of maternal deaths audited between 2017 and 2023. Data were extracted from institutional audit reports and analyzed using a standardized grid. Causes of death, occurrence of the three delays, and recommendations were examined.

Results: The average age of the deceased women was 28.9 years. The majority of deaths occurred at the postpartum period (75%), with a predominance of obstetric hemorrhage (43.8%). Delays in hospital care (3rd delay) were present in 87.5% of cases. Three-quarters of the deaths were considered preventable.

Conclusion : The audit study revealed significant failures in the care chain, particularly in the postpartum period. Improved postpartum monitoring, rapid access to blood, and structured care are top priorities for reducing maternal mortality in Cameroon.

RESUME

Introduction : La mortalité maternelle reste un défi majeur de santé publique au Cameroun. Cette étude visait à analyser les audits des décès maternels réalisés à l'hôpital universitaire de Yaoundé afin d'identifier les causes, les facteurs évitables et les pistes d'amélioration des soins obstétricaux.

Méthode : Il s'est agi d'une étude descriptive et rétrospective de 16 cas de décès maternels audités entre 2017 et 2023. Les données ont été extraites des rapports d'audit institutionnels et analysées à l'aide d'une grille standardisée. Les causes de décès, la survenue des trois retards et les recommandations ont été examinées.

Résultats : L'âge moyen des femmes décédées était de 28,9 ans. La majorité des décès est survenue après l'accouchement (75 %), avec une prédominance des hémorragies obstétricales (43,8 %). Des retards dans les soins hospitaliers (3ème retard) ont été constatés dans 87,5 % des cas. Les trois quarts des décès étaient considérés comme évitables.

Conclusion : L'audit des décès maternels a révélé des défaillances importantes dans la chaîne de soins, en particulier pendant la période post-partum. L'amélioration du suivi post-partum, l'accès rapide au sang et la mise en place de soins structurés sont des priorités absolues pour réduire la mortalité maternelle au Cameroun.

DOI : <https://doi.org/10.64294/jsd.v3i4.197>

Introduction

Maternal mortality remains a crucial indicator of a country's health system performance and level of development. According to the World Health Organization (WHO), approximately 287,000 women died from causes related to pregnancy and childbirth in 2020, more than 70% of which were in sub-Saharan African countries [1]. In Cameroon, the maternal mortality rate remains worrying, with an estimated 467 deaths per 100,000 live births in 2018 [2]. Despite efforts to strengthen the quality of obstetric care, this maternal mortality ratio remains very high because it is three times higher than the minimum acceptable ratio required by the Sustainable Development Goals, which must be less than 140 maternal deaths per 100,000 live births [3]. In this context, maternal death audits are a fundamental tool for understanding the causes, circumstances and contributing factors of deaths. These audits enable the evaluation of care provided, identification of systemic gaps, and formulation of concrete recommendations to enhance the quality of obstetric and neonatal care, in line with the standards outlined in the Global Strategy for Women's Health [4].

The Yaoundé University Hospital (CHU) in Cameroon serves as a crucial tertiary referral facility for managing serious obstetric complications. Despite its importance, audit evidence is not being fully utilized for scientific publications. Therefore, it is essential to evaluate the implementation of maternal mortality audits at this institution, identify preventable factors related to maternal deaths, and propose strategies for improvement.

This study aimed to describe the organization and outcomes of maternal mortality audits conducted at Yaoundé University Hospital. It analyzes the underlying causes of maternal deaths and discusses priority actions to enhance obstetric care at this reference center, as well as to support prevention efforts at the national level.

Method

This study was conducted at the Yaoundé University Hospital, a tertiary-level hospital located in the capital of Cameroon. Referred for the management of complex obstetric pathologies, the university hospital has a university maternity ward with a gynecology-obstetrics department, a neonatology unit, an obstetric operating room, and an internal maternal mortality audit committee. This is a descriptive retrospective study based on the analysis of audit reports of maternal deaths occurring between 2017 and 2023. The audits were conducted in accordance with national guidelines and WHO recommendations on maternal death review. Data were extracted from official audit reports produced by the institutional review board, including case summaries, clinical analyses, collective conclusions, and

recommendations. Reports typically originate from multidisciplinary audit meetings including physicians, midwives, anesthesiologists, managers, and quality managers. The study included all cases of maternal deaths audited during the study period; whose audit reports were complete, including at least the cause of death, whether it was preventable, and contributing factors. We excluded cases where reports were unusable or missing and deaths not classified as maternal according to the WHO definition. The variables collected included sociodemographic data (age, parity) ; obstetric parameters (term, complications, number of prenatal consultations, time of death) ; support data (admission method, quality of care) ; audit analysis (immediate and underlying causes of death, preventability, contributory delays, recommendations).

The three types of delays (the "3 delays" model [5]) were taken into account to characterize the contributing factors: the delay in deciding to consult ; the delay in accessing a healthcare facility and the delay in providing adequate care within the establishment. Data were extracted manually using a standardized form designed in Microsoft Excel. A descriptive analysis was performed, including the frequency of causes of death, the proportion of avoidable deaths, the distribution of delays according to cases and the most frequently made recommendations. The results are presented in the form of tables, frequencies, and percentages. A complementary thematic qualitative analysis was carried out on the recommendations made, in order to identify recurring areas for improvement. The study was conducted in accordance with ethical standards and with full respect for the confidentiality of the extracted information. No personal or sensitive data were used. Administrative authorization was obtained from the Yaoundé University Hospital for access to the audit reports, and ethical clearance was granted by the Institutional Ethics Committee of the Faculty of Medicine and Biomedical Sciences, University of Yaoundé I.

Results

The study focused on 16 cases of maternal deaths occurring at the Yaoundé University Hospital during the period under consideration. The average age of the patients was 28.9 years with extremes ranging from 19 to 39 years. The most represented age group was [25–30] years with 43.8 % of cases. Regarding parity, primiparous and multiparous women represented respectively 31.3% and 37.5% of cases, constituting the majority (Table I).

Among the deceased women, 75% had not had any prenatal consultation. The admission method showed that 56.3% of patients were referred from a peripheral center, and 43.8% came on their own or without a structured referral. The majority of deaths occurred

within 24 hours of admission (Table II). Most deaths (75%) took place in the postpartum period (Table II).

Table I : Sociodemographic and obstetric characteristics of deceased women (N=16)

Variable	Number	%
Age groups (years)		
[19-24]	4	25.0
[25-29]	7	43.8
[30-40]	5	31.3
Parity		
Nulliparous	2	12.5
Primiparous	5	31.3
Multiparous	6	37.5
Grand multiparous	3	18.7
Number of antenatal care		
01 ANC	1	6.3
04 ANC	2	12.5
06 ANC	1	6.3
Not specified	12	75.0
Gestational age		
20 to 28 weeks	3	18.8
28 to 40 weeks	7	43.8
Not specified	6	37.0

ANC= antenatal care

Table II : Distribution of maternal deaths according to admission mode, location, and time of occurrence (N=16)

Variables	Number	%
Moment of death		
Pregnancy	3	18.8
Labour	1	6.3
Postpartum	12	75.0
Admission-to-death interval		
≤24 hours	7	43.8
>24 hours	3	18.8
Not specified	6	37.5
Hospital death site		
Operating room	1	6.3
Delivery room	2	12.5
Intensive care unit	2	12.5
Labour ward	1	6.3
Resuscitation unit	3	18.8
Not specified	7	43.8
Mode of admission		
Referred	11	56.3
Direct	6	43.8
Total	16	100

Obstetric hemorrhages were the leading immediate cause of death, accounting for 43.8% of cases. Underlying causes frequently included: severe anemia, unrecognized heart disease and complicated abortion (Table III).

Table III : Direct and indirect medical causes of maternal mortality identified (N=16)

Categories	Spécific Causes	Number (n)	%
Direct	Postpartum haemorrhage due to uterine atony	2	12.5
	Haemorrhagic shock (after childbirth/abortion)	2	12.5
	Placental retention complicated by haemorrhage	1	6.3
	Uterine rupture	2	12.5
	Eclampsia/hypertensive complications	2	12.5
Subtotal direct	—	10	62.5
Indirect	Severe anaemia	1	6.3
	Malaria	1	6.3
	Heart disease/associated medical condition	1	6.3
Subtotal indirect	—	3	18.8
Undetermined	Cause unknown/unspecified	3	18.8
Total	—	16	100

Among all audited deaths, 75% were considered preventable by the audit committee.

The most frequently identified contributing factors was the third deadline, accounting for 87.5 % of cases (Table IV).

Key failures included late referral, suboptimal health status assessment, delayed or inadequate care, lack of blood products, and inadequate postpartum monitoring. The audits highlighted some notable deficiencies of the healthcare system affecting care delivery in 43.8% of death cases (Figure 1).

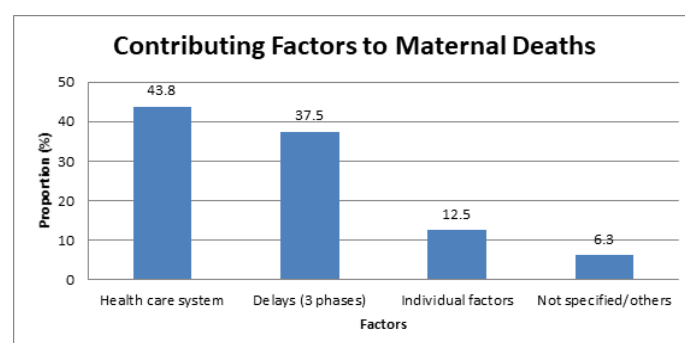


Figure 1 : Factors contributing to maternal deaths identified through the audit (N=16)

The recommendations made by the audit teams mainly focused on improving the reference/counter-reference system, strengthening continuing training of staff, the regular supply of blood and essential consumables, the establishment of systematic

postpartum monitoring.

Table IV : Delay in management

Categories	Number(n)	%
1st delay		
Delay in decision-making	1	6.3
Inadequate means of transport	1	6.3
Not specified	14	87.5
2nd delay		
Late referral	7	43.8
Referral by affinity	1	6.3
Not specified	8	50.0
3rd delay		
Inadequate care/treatment (clinical management errors, inappropriate transfusion, inadequate vascular filling, insufficient resuscitation).	4	25.0
Delayed decision-making/late treatment (late entry into the operating theatre, delayed treatment of atony/eclampsia).	5	31.3
Inadequate monitoring (inappropriate/neglected monitoring, poor perinatal monitoring).	2	12.5
Late or incomplete diagnosis/assessment (late diagnosis of eclampsia, misidentified disease, incomplete admission).	2	12.5
Organisation/coordination of care (non-multidisciplinary care, absence of haemostasis assessment, incomplete admission conditions).	1	6.3
Not specified	2	12.5

Discussion

This study of 16 cases of maternal deaths audited at the Yaoundé University Hospital highlights major failures in the maternal care continuum, reflected by a high proportion of preventable deaths (75%) and a predominance of deaths occurring postpartum (75%). These findings are consistent with trends observed in many resource-limited settings, where maternal mortality remains heavily influenced by delays in access to emergency obstetric care [5,6].

The average age of the deceased women (28.9 years) corresponds to the age group of high fertility, but also of increased risk of obstetric complications. The predominance of women aged 25 to 30 years (43.7%) is similar to that observed in other African studies where the majority of deaths concerned young adults of childbearing age [1, 2]. The relatively low proportion of nulliparous women (13%) contrasts with other studies where nulliparous women are sometimes more exposed to hypertensive complications, but here highlights the involvement of multiparous and grand multiparous women, often exposed to an increased risk of hemorrhage or uterine rupture [7].

The fact that 75% of women did not have a prenatal consultation reveals a major gap in the implementation

of obstetric monitoring, which is essential for early identification of high-risk pregnancies. This finding is worrying and in line with WHO reports which highlight that the lack of prenatal monitoring is a major factor in avoidable mortality [4]. Furthermore, although more than half of the women were referred (56.2%), their arrival in critical condition and death within 24 hours of admission suggest a delay in referral or inadequate upstream care. This phenomenon has also been described in similar audits conducted in Burkina Faso and Mali by Compaoré et al. (2011) and Diarra et al. (2015) respectively [8, 9].

The majority of deaths occurred in the postpartum period (75%), confirming that this phase is often neglected in surveillance strategies. This trend was reported by Aboyeji et al (2007) who identified the immediate postpartum period as the most critical period, mainly due to undetected or poorly managed hemorrhages and infections [10]. This finding is corroborated by WHO analyses, which indicate that nearly two-thirds of maternal deaths occur after delivery, particularly in the first 24 hours [1]. The lack of continuous surveillance, early hospital discharges or lack of staff in maternity wards contribute to this situation [11].

Obstetric hemorrhages accounted for 43.8% of the deaths in this series. This is a consistent trend in most African studies, where uterine atony, uterine ruptures, and placental insertion anomalies are poorly managed due to lack of training, emergency protocols, or available blood bags [4,12]. The presence of hypertensive complications in 12.5% of cases confirms their increasing weight in maternal mortality, as do cardiovascular causes and Disseminated Intravascular Coagulation, often not diagnosed in time in the absence of an appropriate technical platform [13].

The identification of the three delays of Thaddeus and Maine [5] as major contributing factors confirms that deaths are multifactorial: The first delay (12.5%) remains moderate here, but indicates a lack of awareness of danger signs. The second delay (50%) reflects logistical difficulties (distance, transport, cost) and a lack of rapid referral. The third delay (87.5%) is the most worrying: it highlights the inadequacies of the hospital system itself, particularly in terms of rapid care, assessment of clinical condition, availability of blood and coordination between teams [14].

The recommendations proposed in the audit reports are aligned with international standards (WHO, FIGO) [4], particularly with regard to strengthening the referral system, improving blood supply, and postpartum surveillance. However, their implementation remains conditional on institutional will, sustainable funding, and regular monitoring of corrective measures. Continuous training of staff and the development of obstetric protocols adapted to the local context are

essential to reverse this trend.

Conclusion

This study, based on audits of 16 maternal deaths, highlights major failures in the obstetric care continuum. Data analysis revealed a predominance of preventable deaths, occurring mainly postpartum, and linked mainly to obstetric hemorrhage, hypertensive complications, and intercurrent medical conditions. The absence of prenatal consultations in the majority of cases, the variable quality of referrals, and especially delays in intra-hospital care are the main contributing factors. The recommendations resulting from these audits converge on the need to strengthen the health system at several levels. Although the number of cases studied is limited, the data provide valuable qualitative information to guide corrective interventions within the hospital and inform national maternal health policies.

Acknowledgements : We would like to thank for their contribution to the maternal mortality audit, all the healthcare professionals and administrative staff.

Author's Contributions : Véronique sophie Mboua Batoum : corresponding author, conceptualisation and design, acquisition of data, analysis and interpretation of data', drafting the article. Christiane Nsahlaï Jivir Fomu, drafting the article. Pascale Mpono, Ngo Dingom Madye, Serge Robert Nyada, Isidore Tompeen, Cho Joseline Nyuykighan, critically revising important intellectual content, Valere Mve Koh, Elie Nkwabong, Esther juliette Meka Ngo Um, Essiben Felix, critically revising important intellectual content', and final approval of the version to be published'.

Conflict of Interest : The authors work at the university hospital where the audit was conducted, but this has not influenced the study design, data collection, analysis, or reporting. The authors declare that they have no conflict of interest.

Data Availability Statement : The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Funding Statement : This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethics Approval Statement : This study was first submitted to the institutional research ethics committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I for ethical clearance, so that it could be conducted in strict compliance with medical ethics. The data collected were treated anonymously and confidentially.

References

1. World Health Organization. Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division. Geneva: WHO; 2023.
2. National Institute of Statistics (INS) and ICF. Cameroon Demographic and Health Survey 2018. Yaoundé, Cameroon: INS and ICF; 2019.
3. Ngo-dingom MA, Essiben F., Fono A., Mol HL, Dongmo TR, Yomba G., et al. Profile of maternal deaths in a second category hospital in Cameroon. *J SAGO*, 2024; 25(3), 13-19.
4. World Health Organization. Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer. Geneva: WHO; 2004. Available at: <https://apps.who.int/iris/handle/10665/42984>.
5. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med*. 1994;38:1091–1110.
6. Say L, Chou D, Gemmill A, et al. Global causes of maternal death: a WHO systematic analysis. *Lancet Global Health*. 2014; 2(6):e323–e333.
7. Bouvier-Colle MH, Ouedraogo C, Dumont A. Epidemiology of maternal mortality. *Rev Prat*. 2011; 61(6):803-7.
8. Compaoré N, Kiemtore S, Sawadogo YA, Ouédraogo A, Ouédraogo I, Lankoandé J. Audit of maternal deaths at the Yalgado Ouédraogo University Hospital (CHU-YO) in Ouagadougou. *Afr J Reprod Health*. 2015;19(2):120–6.
9. Diarra A, Kanté A, Traoré M, Traoré I, Sanogo D, Diallo A, et al. Audit of maternal deaths in a district hospital in Mali. *Afr J Reprod Health*. 2015;19(4):113–8.
10. Aboyeji AP, Ijaiya MA, Fawole AA. Maternal mortality in a Nigerian teaching hospital - a continuing tragedy. *Too Doct*. 2007; 37(2):83-5.
11. Knight M, Bunch K, Tuffnell D, Shakespeare J, Kotnis R, Kenyon S, Kurinczuk JJ. Saving Lives, Improving Mothers' Care – Lessons learned to inform maternity care from the UK and Ireland Confidential Inquiries into Maternal Deaths and Morbidity 2017–19. Oxford: National Perinatal Epidemiology Unit, University of Oxford; 2021.
12. Calvert C, Thomas SL, Ronsmans C, Wagner KS, Adler AJ, Filippi V. Identifying regional variation in the prevalence of postpartum haemorrhage: a systematic review and meta-analysis. *PLoS One*. 2012;7(7):e41114.
13. Cresswell JA, Alexander M, Chong MYC, Link HM, Pejchinovska M, Gazeley U, et al. Global and regional causes of maternal deaths 2009–20: a WHO systematic analysis. 2025;13.
14. Knight HE, Self A, Kennedy SH. Why are women dying when they reach hospital on time?' A systematic review of the 'third delay'. *PLoS One*. 2013;8(5):e63846.



Barrières à l'implémentation de la Méthode Mère Kangourou dans trois formations sanitaires de la région du centre Cameroun

Barriers to the implementation of the Mother Kangaroo Method in three health facilities in the central region of Cameroon

Ehouzou Mandeng MN^{1,2,3}; Amor Ndjabo M⁴; Bilo'o LL^{3,9}; Simé Tchouamo AA^{5,6};
Abouamé Palma H^{7,8}; Nyemb Mbog GJT^{10,11}; Kimessoukié Omolomo E⁸; Ngo Um Sap S^{3,10};
Kalla GCM^{1,11}

Article Original

1. Centre Hospitalier Universitaire de Yaoundé, Cameroun
2. Hôpital de Référence de Sangmélina, Cameroun
3. Faculté de Médecine et des Sciences Pharmaceutique de Sangmélina, Université d'Ebolowa, Cameroun
4. Ecole des Sciences de la Santé de l'Université Catholique d'Afrique Centrale, Yaoundé, Cameroun
5. Faculté de Médecine et des Sciences Pharmaceutiques de Dschang/Université de Dschang
6. Hôpital Gynéco-Obstétrique et Pédiatrique de Yaoundé, Cameroun
7. Hôpital Régional de Garoua, Cameroun
8. Faculté de Médecine et des Sciences Biomédicales de Garoua/ Université de Garoua, Cameroun
9. Centre Hospitalier Régional, Ebolowa, Cameroun
10. Centre Mère-Enfant de la Fondation Chantal Biya, Yaoundé, Cameroun
11. Faculté de Médecine et des Sciences Pharmaceutiques, Université de Yaoundé I, Cameroun

Auteur correspondant: Marcelle Nina Ehouzou Mandeng, Faculté de Médecine et des Sciences Pharmaceutique de Sangmélina, Université d'Ebolowa, Email: ehouzoumandeng@gmail.com, Tel (+237)680638366

Keys words: Kangaroo Mother Care, Implementation barriers, Preterm infants, Neonatal care, Cameroon
Mots clés : Méthode Mère Kangourou, Barrières d'implémentation, Prématurité, Soins néonataux, Cameroun

Date de soumission: 11/11/2025
Date d'acceptation: 09/12/2025

RESUME

Introduction : La Méthode Mère Kangourou (MMK) est une approche recommandée par l'OMS pour réduire la mortalité néonatale chez les prématurés et nouveau-nés de faible poids. Le but de cette étude était d'identifier les barrières à l'implémentation de la MMK dans trois formations sanitaires.

Méthodes : Nous avons mené une étude transversale qualitative avec collecte rétrospective des données dans trois établissements. Les données étaient collectées par entretien semi-structuré auprès de 21 participants de la chaîne décisionnelle (administrateurs, médecins, infirmières, sages-femmes). L'analyse s'est basée sur le modèle de suivi de progrès de Bergh et al., structuré en trois phases : pré-implémentation, implémentation et institutionnalisation.

Résultats : Plusieurs barrières majeures ont été identifiées. En pré-implémentation l'on notait une implication administrative faible, des difficultés de recrutement du personnel qualifié, le non-respect des normes infrastructurelles de la MMK. Durant l'implémentation : communication difficile avec les mères due aux barrières linguistiques et culturelles, obstacles liés aux mères (absentéisme, instabilité médicale), réticence familiale notamment des seconds porteurs, faible implication du personnel post-projet, obstacles. Durant la phase de l'institutionnalisation il a été noté des difficultés d'accès au suivi ambulatoire et l'absence d'incitations financières après le projet.

Conclusions : L'implémentation effective de la MMK au Cameroun nécessite un leadership administratif renforcé, une amélioration des infrastructures selon les normes requises, une formation continue du personnel, et des stratégies de communication adaptées au contexte socioculturel local.

ABSTRACT

Background: Kangaroo Mother Care (KMC) is a WHO-recommended approach to reduce neonatal mortality among preterm and low birth weight infants. This study aimed to identify barriers to KMC implementation in three health facilities in the Centre Region of Cameroon.

Methods: We conducted a cross-sectional qualitative study with retrospective data collection in three health facilities that participated in the DIB project: Yaoundé University Teaching Hospital, Yaoundé Gyneco-Obstetric and Pediatric Hospital, and Bafia District Hospital. Data were collected through semi-structured interviews with 21 participants from the decision-making chain (administrators, physicians, nurses, midwives). Analysis was based on Bergh et al.'s progress monitoring model, structured in three phases: pre-implementation, implementation, and institutionalization.

Results: Several major barriers were identified. During pre-implementation: weak administrative involvement, difficulties in qualified staff availability, and non-compliance with infrastructural standards. During implementation: difficult communication with mothers due to linguistic and cultural barriers, mother-related obstacles (absenteeism, medical instability), family reluctance particularly from second carriers, weak post-project staff involvement, breastfeeding obstacles including "ndiba" cultural beliefs. During Institutionalization: difficult access to ambulatory follow-up care and Lack of financial incentives after project completion particularly affected staff engagement.

Conclusions: Effective KMC implementation in Cameroon requires strengthened administrative leadership, infrastructure improvements according to required standards, continuous staff training, and communication strategies adapted to the local sociocultural context. Sustainable incentives and accessible ambulatory follow-up systems are essential for successful scaling-up of this life-saving intervention.

DOI : <https://doi.org/10.64294/jsd.v3i4.198>

Introduction

La Méthode Mère Kangourou (MMK) est une méthode de soins pour les nouveau-nés prématurés ou de faible poids de naissance dont le procédé repose sur un contact peau à peau entre le bébé et la mère (ou un adulte de substitution), sur un allaitement maternel exclusif et une sortie précoce de l'hôpital (1). Dans le monde, la prématurité est l'une des principales causes de la mortalité néonatale. Au Cameroun, selon l'EDS 2018, la mortalité néonatale est élevée et stagne à 28 ‰ depuis 2014 (2). Pour réduire cette mortalité, en 2017, le Cameroun a adopté la recommandation de l'Organisation Mondiale de la Santé (OMS) visant à vulgariser la MMK dans tous les pays en développement (3). Le projet « Development Impact Bond » (DIB néonatal camerounais) a été mis en place dans dix établissements de santé au Cameroun pour une période de deux ans (de Janvier 2019 à Janvier 2021), dans l'optique d'implémenter la MMK de qualité au Cameroun (4). L'objectif à la fin de ce projet était la mise en œuvre progressive de la pratique de la MMK de qualité sur l'ensemble du territoire national (5,6). En prélude à cette étape nous nous sommes proposé de déterminer les barrières à la mise en œuvre de la MMK dans trois formations sanitaires de la région du Centre, au Cameroun.

Méthodologie

Nous avons mené une étude transversale qualitative, à collecte prospective. Elle a été réalisée dans trois formations sanitaires de la région du Centre Cameroun, impliquées dans le projet « Development Impact Bond » (DIB néonatal camerounais). Il s'agissait du Centre Hospitalier et Universitaire de Yaoundé (CHUY), l'Hôpital Gynéco-Obstétrique et Pédiatrique de Yaoundé (HGOPY) qui sont deux formations sanitaires de catégorie 1 dotées de ressources humaines hautement qualifiées et l'Hôpital de District de Bafia (HDB) de catégorie 4 ayant à sa tête une sage-femme formée en MMK dans le cadre du projet DIB. L'implémentation de la MMK dans ces formations sanitaires s'est faite selon les étapes du modèle de suivi de progrès proposé par Bergh et al en 2005 en Afrique du Sud (7) (figure 1). Ce modèle de suivi a été conceptualisé autour de trois phases : pré-implémentation, implémentation et institutionnalisation (7). Les trois formations sanitaires étaient dotées des installations de base requises pour la pratique de la MMK (une ou plusieurs salles de couveuses, une chambre mère-enfant et une salle de consultation externe et ambulatoire). Le protocole de soins dans le cadre de la MMK était identique, à savoir basé sur le guide de prise en charge de la MMK proposé et validé par la Fundación Canguro de Colombie (1) et adapté aux conditions locales camerounaises par la « Fondation Kangourou Cameroun » (FKC). Certains soins d'urgences dans le protocole étaient gratuits ou supportés par le

projet DIB, tels que la mise sous oxygène, la pose d'un cathéter veineux ombilical. Dans chacune des formations sanitaires, un groupe de personnel constitué d'un médecin/pédiatre, deux infirmières, une sage-femme, un physiothérapeute et un psychologue clinicien avait reçu une formation en MMK dans le Centre d'Excellence de Formation en MMK à l'hôpital Laquintinie de Douala avant le début du projet (4). Une fois la formation terminée, l'équipe formée dans la MMK était tenue de faire une restitution avant le début du projet sur site. Les participants étaient le personnel de la chaîne décisionnelle et soignant desdites formations sanitaires. L'échantillonnage était non probabiliste de convenance jusqu'à l'atteinte de la saturation. La collecte des données s'est faite à l'aide d'un guide d'entretien semi-structuré afin de recueillir leurs verbatim selon les différentes phases d'implémentation de la MMK dans leurs formations sanitaires respectives. Aussi nous avons visité et observé l'effectivité de la pratique de la MMK toute la durée de l'étude de Janvier à Avril 2022. L'analyse de contenu s'est faite suivant les phases et dimensions du modèle de suivi de progrès de Bergh et al. (7). Toutes les autorisations administratives ont été obtenues avant le début de la collecte des données. Nous avons obtenu de l'Université Catholique d'Afrique Centrale et l'Hôpital Gynéco-Obstétrique et Pédiatrique de Yaoundé (HGOPY) deux clairances éthiques dont les numéros de références étaient N°2021/020967/CEIRSH/ESS/MSP et N°256/CEIRSH/DM/2022 respectivement. Le consentement libre et éclairé a été obtenu des participants et l'anonymat a été respecté.

Résultats

L'effectif était constitué de 21 participants. L'âge moyen des participants était de 47,9 ans avec des extrêmes de 35 et 66 ans, un écart-type $\pm 9,46$ ans. Le sexe ratio était de 0,9 en faveur des femmes. Plus de la moitié des répondants soit 52,4% (n=11) était représentée par les Infirmiers Diplômés d'Etat (IDE) suivis des médecins qui représentaient 29% (n=6). Cependant les administrateurs représentaient 14,3% (n=3) de notre population. Plus de la moitié des participants soit 66,6% (14) avait une expérience professionnelle de plus de 10ans. La majorité des participants soit 90,4% (19) était impliquée dans l'implémentation et la pratique de la MMK depuis une période de 2 ans. Seuls 2 (9,6%) participants avaient une durée d'implication de moins d'un an. Il s'agissait de deux administrateurs nouvellement affectés. L'HDB était la formation sanitaire qui avait reçu le plus de personnels formés en MMK. Après le projet, un seul personnel formé était encore en poste. L'affectation du personnel ailleurs, le redéploiement du personnel formé en MMK dans d'autres unités, l'absence de renouvellement de contrat, le départ en formation étaient les raisons de non disponibilité du personnel formé en MMK à leur poste dans cet

hôpital (Tableau I).

Le stade de pré-mise en œuvre de la MMK

Le stade de pré-mise en œuvre de la MMK a rencontré beaucoup de difficultés et de goulots d'étranglement durant son processus et ce 6 mois après la fin du projet (Tableau II).

• Faible implication des administrateurs

Elle a été rapportée par certains participants. Beaucoup auraient aimé voir leurs administrateurs s'intéresser à leurs difficultés sur le terrain. Les répondants R4HGOPY et R7CHU s'exprimaient à propos : « *Mais s'agissant de l'implication de l'administration... humm, je ne la sens pas trop, est-ce qu'ils font des efforts visibles ? (...) vraiment je ne vois pas vraiment.* » ; « *(...) cette implication est partielle (...) dans la mesure où, moi par exemple je n'ai pas encore vu la direction générale venir par rapport à cette MMK. Je veux dire venir pour le suivi et l'encadrement du personnel ou tout simplement visiter nos locaux sur le terrain.* ».

• Difficulté de la mise à disposition du personnel

Malgré la signature des protocoles d'accord en début de projet, certaines administrations se sont heurtées à une limitation d'action en termes de recrutements du personnel supplémentaire, qui ont retardé le début de la mise en œuvre de la MMK. Le répondant R1HGOPY le stipulait en ces termes : « *Parce qu'ils n'ont pas les mains libres pour faire certaines choses. Par exemple embaucher le personnel. (...).* »

• Non-respect des normes infrastructurelles

Toutes les formations sanitaires n'ont pas totalement respecté les normes infrastructurelles. Et Cette observation a été faite par l'investigateur principal. Ainsi il a été observé qu'une salle mère-enfant a été construite à HGOPY mais faute de personnel, elle est demeurée non fonctionnelle jusqu'au moment de cette étude. Les raisons évoquées étaient la non disponibilité du personnel, et la décision centralisée du recrutement. D'autres structures de santé ont noté le caractère étroit des salles. Les répondants R6HGOPY et R2CHU le soutenaient en ces termes : « *Les infrastructures ne respectent pas les normes, (...) Nous avons juste cherché un supplément d'espace pour la MMK.* » ; « *Donc on souhaiterait que le cadre définitif alloué à la MMK soit spacieux et respectent les normes. (...).* ».

Aussi l'absence d'une salle de repos pour les mères, la mauvaise aération et la présence des berceaux dans les salles de MMK étaient des insuffisances qui ne facilitaient pas la pratique d'une MMK de qualité. R3CHU le dit en ces termes : « *Les salles ne sont pas spacieuses pour l'aération, les mamans transpirent, ça chauffe (...) Il y a aussi un manque de salle de repos pour les mères dont le ou les bébés sont internés en néonatalogie.* ».

Stade de mise en œuvre (Tableau III)

• Communication difficile avec les mères

Dans cette étude, plusieurs facteurs ont contribué à rendre la communication sur la MMK difficile en pratique. Le manque de discipline des mères, les troubles de l'audition ou d'élocution chez certaines mères, le niveau d'instruction bas et l'analphabétisme étaient les facteurs évoqués par nos différents répondants. Le Répondant R4HDB s'exprimait en ces mots : « *La communication est ce que nous faisons ici tous les jours à toute heure. Elle est très importante, parce que les mamans sont d'abord têtues, elles ne comprennent pas rapidement (...).* ».

Sur le plan socio-culturel, l'on a retenu des répondants que le caractère conservateur, patriarcal, traditionnaliste et parfois xénophobe des certaines communautés ne rendaient pas la communication facile. R3HDB relatait son expérience en ces termes : « *Parce que nous sommes devant un peuple xénophobe et traditionaliste. (...) Il y avait parfois au suivi ambulatoire il n'y a pas les mamans parce le mari est sorti sans leur donner la permission de sortir.* ».

• Obstacles liés à la mère

Le retard de démarrage de l'initiation à la MMK était relaté par tous les répondants devant un contexte de césarienne de la mère, ou d'une instabilité pour cause médicale (HTA, psychose). Mais aussi on pouvait noter et observer l'absentéisme des mères en salle de MMK pour diverses raisons comme : aller se restaurer, chercher de moyens financiers pour recouvrir les soins hospitaliers, et aller s'occuper des autres enfants restés seuls en communauté. Le Répondant R2HGOPY en parlait en disant : « *Parfois elles sont en retard. Tu vas demander à la maman pourquoi elle vient porter son bébé tard ; elle va te répondre qu'elle est allée manger. L'autre te dira qu'elle est allée à la douche.* ».

• Obstacles liés à la famille

L'absence, l'indisponibilité ou la réticence du second porteur à la pratique de la MMK a été rapportée et observée dans toutes les formations sanitaires. A ce propos les répondants R2HGOPY et R10CHU respectivement le relataient en ces termes : « *Le second porteur est aussi un problème. Beaucoup refusent. Ceux qui acceptent font l'alternance avec la mère ; jamais les 2 à la fois* » ; « *(...) Nous signalons juste que parfois le second porteur qui s'est signalé au début pour aider la maman désiste en cours de chemin et la maman se retrouve seule à gérer la MMK, cela est souvent une source de stress.* ».

• Faible ressource en personnel

Au cours du projet DIB, l'absentéisme, l'affectation et le redéploiement du personnel formé en MMK dans certaines unités étaient des difficultés

supplémentaires à la mise en œuvre de la MMK. La non disponibilité des spécialistes comme le psychologue et le physiothérapeute étaient des insuffisances relatées et observées dans les formations sanitaires. Elles ont été plus observées à l'HDB où la majorité du personnel formé n'était plus en poste au moment de l'étude. Dans ces conditions nous avons observé le personnel paramédical poser des gestes médicaux pour lesquels il n'est pas qualifié faute de médecin. R4HDB le décrit en ces termes : « (...) *Mais il y a des gestes qu'on dit souvent que c'est le médecin qui doit faire comme la pose des cathéters centraux, la prescription des antibiotiques, mais nous sommes obligés de le faire. Le médecin n'est pas souvent là (...)* ».

• **Obstacles à l'allaitement maternel**

Le décès de la mère à la naissance, un contexte de césarienne, ou de pathologie médicale telle l'HTA ou autres étaient des obstacles majeurs à l'initiation de l'allaitement maternel en MMK. Une production insuffisante de lait et le stress maternel étaient tout aussi observés barrières non négligeables et une source de pression pour la prescription de substituts de lait maternel. Les croyances « *du lait gâté* » appelé « *ndiba* » sont fréquemment évoquées par les mères et même par les familles de la région du centre. Cette croyance est une perception contre l'allaitement maternel très fort et constitue un frein supplémentaire à l'allaitement. Cette croyance dans la culture Fang-Beti stipule que les décès antérieurs des enfants nourris au sein sont susceptibles de se reproduire sur les cadets en cas de recours à l'allaitement maternel chez ces derniers. Cette croyance confère une réticence irréversible face à l'allaitement exclusif. Les répondants R3CHU et R3HGOPY partageaient leur expérience respectivement en ces termes : « *Il y a les pensées et idées culturelles qui se posent, le « ndiba » où la maman te dit que si elle donne son lait au bébé, il va avoir la diarrhée, bref être malade ou en mourir. En fait elles estiment que le lait est gâté.* ».

Enfin, les obstacles liés au démarrage de l'allaitement sus-cités facilitaient la prescription des substituts de lait maternel avant que la maman soit disponible. Cette pratique fréquente en zone urbaine, R4HGOPY l'expliquait en ces mots : « *C'est le lait maternel qui est prescrit en première intention. Mais lorsque la mère est indisponible au début, c'est alors que nous prescrivons ces laits que vous voyez (en pointant le doigt sur les nombreuses boîtes de lait posées sur la paillasse).* ».

Stage d'institutionnalisation (Tableau IV)

• **Obstacles à l'accès aux soins en suivi ambulatoire**

En suivi ambulatoire, l'accès aux soins s'est révélé difficile pour les prématurés sortis des unités de néonatalogie. Ce suivi était payant à HGOPY et au

CHU. AHGOPY la nouvelle administration a augmenté le prix des consultations tout en raccourcissant le délai de validité. R5HGOPY expliquait ainsi : « *Avec le nouveau DG, on a augmenté les frais de consultation et écourté le nombre de jours de validité. Donc chaque semaine les mamans doivent payer, ce qui limite l'accessibilité et motive l'abandon.* ». De plus l'accès au suivi multidisciplinaire était difficile pour les parents. Très souvent le spécialiste le plus proche se trouvait à des kilomètres. Parfois la prise de RDV était payante et protocolaire. R1CHU disait à propos : « *Voilà un volet qui n'a pas été bien implémenté parce que normalement on devait avoir des médecins disposés pour les consulter sans trop de protocoles. Mais ce que nous faisons nous sommes obligés de les envoyer prendre des RDV avec ces spécialistes tels que les ophtalmologues et les ORL.* ».

• **Démotivation du personnel après le projet DIB**

Selon R5HGOPY certains personnels avaient perdu leur motivation dans la pratique de la MMK. C'est la raison de l'évolution en dent de scie des performances du personnel. Voici la quintessence de ses propos : « *Concernant le personnel, tous ne se sentent pas concernés par les soins kangourou. Lorsqu'ils vont travailler, ils ne vont pas aborder le sujet avec les mamans. Les mères vont se débrouiller comme elles peuvent, jusqu'à revoir le médecin ou les infirmières plus impliqués le lendemain.* ». Les raisons de ce manque d'implication du personnel étaient davantage expliquées par le répondant R6HGOPY. Il évoquait la suspension des primes (incitations financières) à la fin du projet pilote en ces termes : « *La conséquence c'est qu'on trouvera dans le personnel, ceux qui sont très impliqués dans la MMK et d'autres qui le sont moins. Pire encore en ce moment où le projet fini, les uns et les autres ne perçoivent plus de primes.* »

Discussion

Plusieurs barrières à l'implémentation de la MMK ont été identifiées dans notre étude. Il s'agissait notamment d'une implication moins forte des administrateurs des formations sanitaires. Par contre plusieurs autres études en contexte africain et sud asiatique rapportaient un leadership très fort ayant permis l'implémentation aisée de la MMK dans leur pays. C'est le cas de Kourouma et al. en 2021(8) en Côte d'Ivoire ou de Apurv et al. en 2016 en Inde (9). Ces derniers ont utilisé les médecins champions en MMK afin d'augmenter l'implication des acteurs dans la mise en œuvre de la pratique de la position Kangourou en zone rurale et ce même des mois après les projets d'implémentation.

Concernant les infrastructures, les normes n'ont pas été totalement respectées dans toutes les formations sanitaires de notre étude. Cette insuffisance entravait la qualité de la pratique de la MMK selon son protocole. A ce propos les études de Mejhabeen et al en 2021

(10) au Bangladesh et Jamali et al. au Pakistan en 2019 (11) se sont heurtées à des difficultés de fonctionnement similaires avec des salles étroites, peu ventilées, n'assurant pas l'intimité des mères et occasionnant une réticence à la pratique de la méthode. Dans une de nos formations sanitaires, toutes les composantes de la MMK se pratiquaient dans la même pièce, faute de disponibilité du personnel pour occuper les salles supplémentaires disponibles.

La communication était difficile avec les mères pour diverses raisons dans notre contexte. Plusieurs études placent la communication avec les mères au cœur de la réussite de la pratique de la MMK. Kampekete et al. en 2018 (12) en Zambie l'ont démontré dans une étude mixte en mettant en évidence une différence statistiquement significative entre une bonne communication et l'acceptation de la réalisation de la MMK. Pour nos répondants l'objectif premier était de convaincre les mères et les familles d'accepter ou au mieux d'adhérer aux différentes composantes de la MMK. Au Bangladesh Mehjabeen et al., et Kampekete et al en Zambie ont trouvé des résultats similaires qui consistaient à insister sur la communication au moment de la sortie qui permettait de prévenir les décès en communauté, l'hypothermie et l'hypoglycémie (10,12). En outre dans notre contexte, la communication a connu plusieurs obstacles en zone rurale, telles que les barrières de la langue, le manque de discipline des mères, les barrières culturelles et traditionnelles. Au Bangladesh en 2021, un manque d'engagement a plutôt été retrouvé chez les mères pour la simple raison que ces dernières ne participaient pas au processus de prise de décision. Cette particularité des communautés musulmanes a été relevée dans notre étude. Ainsi pour la poursuite de la pratique de la MMK les prestataires de soins ont préféré mener les séances d'éducation avec les époux et ou les belles-mères (10). Parfois la réticence à la pratique de la MMK était motivée par un séjour prolongé en hospitalisation, la culpabilité de ne pas effectuer leurs tâches ménagères, l'impossibilité de ne pas s'occuper des autres enfants. Chez nous le personnel estimait que le manque de discipline des mamans était l'obstacle majeur à une bonne communication en faveur de la MMK. En réalité dans notre contexte les mamans hospitalisées sont obligées de sortir des unités pour aller se restaurer, payer le factures/les médicaments, et de s'occuper des autres enfants restés à la maison.

Concernant l'indisponibilité des mères à l'initiation de la MMK, des auteurs chinois tels que Yue et al. en 2020 rapportent « le confinement post-natal » comme étant un retard à l'initiation à la MMK (13). En effet « le confinement du post-partum » est une coutume ancestrale encore pratiquée de nos jours. Il s'agit de garder la mère à l'intérieur où elle est exempte de

toutes corvées domestiques et de soins pour elle et son nouveau-né. Contrairement aux mères de notre étude l'on aurait pensé qu'un confinement en post partum serait favorable à l'initiation précoce de la MMK. Mais selon les auteurs les mères chinoises réfutent la MMK de peur d'être critiquées par leur mère ou belle-mère de ne pas respecter cette prescription culturelle ancestrale (10,13).

Concernant les familles et leur culture, elles sont à l'origine des obstacles non négligeables dans notre contexte comme en Côte d'Ivoire où les pères acceptent difficilement la séparation avec leur conjointe et leur enfant surtout lorsque l'enfant est admis en MMK continue. Pour eux, l'arrêt de l'usage de la couveuse est synonyme de guérison. Aussi Kourouma et al rapportent une réticence à porter le nouveau-né sur la poitrine, contrairement aux traditions africaines où le bébé est porté sur le dos de sa maman (8,14). Par contre les grands-parents en chine s'opposaient à la MMK de peur que le bébé ne prenne froid en étant nu ou que la transpiration maternelle ne nuise au bébé pendant la pratique de la MMK (13). Dans notre contexte le défi majeur était de trouver un second porteur pour soulager la maman en MMK continue.

Le manque de temps, la charge de travail, le manque de personnel sont les différents obstacles retrouvés dans plusieurs études qualitatives (13,15,16). En effet comme dans notre étude, la pratique de la MMK requiert du temps et de la patience auprès des mères stressées par l'état de leur enfant. Aussi les ressources financières et humaines limitées des institutions ne permettent pas souvent le recrutement de plus de personnel. La formation de tout le personnel impliqué dans la pratique de la MMK n'est pas toujours effective dans notre contexte ce qui crée une inégalité des connaissances et forcément une implication non homogène dans la pratique de la MMK. Cet obstacle a été notifié par les répondants des travaux de Kourouma et al. en Côte d'Ivoire en 2021 (8). Nous avons retrouvé peu d'études relevant des obstacles liés à l'absence de motivation financière. Mais par contre l'usage des bénévoles dans la pratique de la MMK a permis à l'inde d'améliorer l'implémentation de la MMK (9).

L'allaitement maternel, pratiqué dans le cadre de la MMK a rencontré également des difficultés diverses malgré ses bénéfices et ses avantages pour le couple mère-enfant en MMK (17). Les facteurs qui retardaient l'initiation de l'allaitement maternel dans notre étude étaient similaires dans les travaux de Sachdeva et al. en 2019 en inde (18). Seulement dans leur contexte des efforts sont faits pour donner le lait maternel pasteurisé issu des lactariums durant toute la durée d'hospitalisation. Selon ces auteurs, cette stratégie augmenterait la pratique de l'allaitement maternel exclusif (18). Aussi, les substituts de lait maternel

étaient prescrits uniquement dans les conditions particulières. Notamment en cas de décès maternel, d'absence de banque de lait, ou d'une insuffisance de production de lait maternel prouvée chez la mère. Dans notre contexte il a été observé dans certaines formations sanitaires que les substituts de lait maternel étaient prescrits à la moindre difficulté.

La problématique de l'accessibilité aux soins s'est posée au moment de la sortie et du suivi ambulatoire. Selon les travaux de Mathias et al., en 2020 au Malawi, plusieurs actions étaient entreprises dès l'admission afin de garder la dyade mère-enfant dans les soins même après la sortie. Il s'agissait notamment de l'intervention de l'action sociale, un système de liaison entre les services des formations sanitaires et les communautés, et des prix abordables des services de la MMK (19).

Forces et limites

Cette étude nous a permis de mettre en évidence les principales barrières à l'implémentation de la MMK dans notre contexte. Nous avons pu recueillir les données des administrateurs, et du personnel soignant dans les formations sanitaires sélectionnées. Également nous avons pris en compte l'utilisation du protocole de MMK et les différentes phases d'évaluation de la pratique de la MMK. Notre exploration était accompagnée d'une phase d'observation qui nous a permis de corroborer les allégations des participants liées à la pratique de la MMK. Cette approche nous a permis d'avoir une vision globale des améliorations qu'il faudra apporter pour améliorer la mise à échelle de la MMK. Cependant, cette étude n'est pas exempte de limites. Pour une action holistique nous aurions pu intégrer les avis des mères, des familles et même des leaders de communauté afin d'avoir leur propre perception sur la pratique de la MMK. Aussi nous avons sélectionné formations sanitaires, une taille de l'échantillon jugée petite par rapport à l'ensemble des formations sanitaires de la région.

Conclusion

Cette étude révèle des barrières significatives à l'implémentation de la MMK dans les formations sanitaires camerounaises, notamment le manque de leadership administratif, les défaillances infrastructurelles, les obstacles socioculturels et l'insuffisance de motivation du personnel post-projet. Pour réussir la mise à échelle nationale de la MMK, il est impératif de renforcer l'engagement institutionnel, d'adapter les stratégies de communication au contexte local, d'assurer la formation continue du personnel et de pérenniser les incitations. Ces améliorations sont essentielles pour optimiser cette intervention salvatrice et réduire significativement la mortalité néonatale au Cameroun.

Remerciements : Nous tenons à remercier les administrateurs des formations sanitaires qui ont été incluses dans ce travail. Nous manifestons également de la reconnaissance à toutes les équipes de soins pour leur collaboration.

Contributions des auteurs : EMMN, EKO, GCMK, MAN : Conception de l'étude, EMMN, STAA, LLB, NMGJT : Revue de la littérature, EMMN, LLB, APH : Collecte des données, EMMN, STAA, MAN, LLB : Discussion du cas, GCMK, SNUS, STAA, APH, MAN, LLB, NMGJT : Révision

Conflits d'intérêts : Les auteurs ne déclarent aucun conflit d'intérêts.

Financement : Aucun

Références

1. MINSALUD. Actualización de los Lineamientos Técnicos para la implementación de Programas Madre Canguro en Colombia, con énfasis en la nutrición del neonato prematuro o de bajo peso al nacer. 2017.
2. Institut National des Statistiques (INS), ICF. Enquête de démographie et de santé (Cameroun). Rockville-Maryland. Vol. 5eme édition. USA; 2020. 739 p.
3. OMS. Kangaroo mother care A transformative innovation in health care. 2023.
4. Fondation Kangourou Cameroun. Development Impact Bond (DIB) Néonatal Camerounais.
5. MINSANTE, Fondation Kangourou Cameroun, Grand Challenges Canada, Social Finance, Mars, Nutrition International, Global Financing Facility, Fundacion Canguro. Obligation à impact pour la MMK au Cameroun sur le développement 2019.
6. Social Finance. Obligation à Impact Pour le Développement de la Méthode Mère Kagourou. Retour d'expérience et leçons pour le passage à échelle. 2021.
7. Bergh A, Arsalo I, Malan AF, Patrick M, Pattinson RC, Phillips N. Measuring implementation progress in kangaroo mother care. *Acta Paediatr*. 2005 ; 94(8):1102-8.
8. Kourouma KR, Agbré-Yacé ML, Doukouré D, Cissé L, Some-Méazieu C, Ouattara J, et al. Barriers and facilitators to kangaroo mother care implementation in Cote d'Ivoire: a qualitative study. *BMC Health Serv Res*.2021;21(1):1211.
9. Soni A, Amin A, Patel DV, Fahey N, Shah N, Phatak AG, et al. The presence of physician champions improved Kangaroo Mother Care in rural western India. *Acta Paediatr* 2016;105(9).
10. Mehjabeen S, Matin M, Gupta RD, Sutradhar I, Mazumder Y, Kim M, et al. Fidelity of kangaroo mother care services in the public health facilities in Bangladesh: a cross-sectional mixed-method study. *Implement Sci Commun*. 2021;2(1):115.
11. Jamali QZ, Shah R, Shahid F, Fatima A, Khalsa S, Spacek J, et al. Barriers and enablers for practicing kangaroo mother care (KMC) in rural Sindh, Pakistan. Ameh CA, éditeur. PLOS ONE. 17 juin 2019;14(6):e0213225.
12. Kampekete GSM, Ngoma C, Masumo M. Acceptance of kangaroo mother care by mothers of premature babies. *Afr J Midwifery Womens Health*. 2018;12(4):178-88.
13. Yue J, Liu J, Williams S, Zhang B, Zhao Y, Zhang Q, et al. Barriers and facilitators of kangaroo mother care adoption in five Chinese hospitals: a qualitative study. *BMC Public Health*. 2020;20(1):1234.
14. Anne-Marie Bergh1*, Rhoda Manu2, , Karen Davy1, , Elise

- van Rooyen¹, , Gloria Quansah Asare³, , J Koku Awoonor Williams⁴, et al. Translating research findings into practice – the implementation of kangaroo mother care in Ghana. *Implement Sci.* 2012;(7):75.
15. Kinshella MLW, Salimu S, Chiwaya B, Chikoti F, Chirambo L, Mwaungulu E, et al. "So sometimes, it looks like it's a neglected ward": Health worker perspectives on implementing kangaroo mother care in southern Malawi. Gurgel RQ, éditeur. *PLOS ONE.* 2020;15(12):e0243770.
 16. Wang Y, Zhao T, Zhang Y, Li S, Cong X. Positive Effects of Kangaroo Mother Care on Long-Term Breastfeeding Rates, Growth, and Neurodevelopment in Preterm Infants. *Breastfeed Med.* 2021;16(4):282-91.
 17. Chan G, Bergelson I, Smith ER, Skotnes T, Wall S. Barriers and enablers of kangaroo mother care implementation from a health systems perspective: a systematic review. *Health Policy Plan.* 2017;32(10):1466-75.
 18. Chugh Sachdeva R, Mondkar J, Shanbhag S, Manuhar M, Khan A, Dasgupta R, et al. A Qualitative Analysis of the Barriers and Facilitators for Breastfeeding and Kangaroo Mother Care Among Service Providers, Mothers and Influencers of Neonates Admitted in Two Urban Hospitals in India. *Breastfeed Med.* 2019;14(2):108-14.
 19. Mathias CT, Mianda S, Ginindza TG. Facilitating factors and barriers to accessibility and utilization of kangaroo mother care service among parents of low birth weight infants in Mangochi District, Malawi: a qualitative study. *BMC Pediatr.* 2020;20(1):355.



Informed consent: myth or reality in the surgical units of Yaoundé Central Hospital?

Le consentement éclairé : mythe ou réalité dans les services chirurgicaux de l'Hôpital Central de Yaoundé ?

Meva'a Biouélé RC^{1,2,*}, Ngongang GFO^{3,4}, Nkolo Tolo FE³, Mouangue L¹, Maa Kinyock B², Fouda Owona EN², Mossus Y², Atanga LC², Ngo Nyéki AR^{1,2}, Mindja Eko D^{1,2}, Ngaba Mambo ON^{1,2}, Nseme Etouckey E^{3,4}

Original Article

1. ENT and Cervico-Maxillofacial Surgery Unit, Yaoundé Central Hospital, Yaoundé, Cameroon
2. Department of Ophthalmology, ENT and Stomatology, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaoundé, Cameroon
3. Department of Morphological Sciences, Anatomy and Pathology, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaoundé, Cameroon
4. Forensic Medicine and Medical Expertise Laboratory, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaoundé, Cameroon.

Corresponding author: Roger Christian Meva'a Biouele, ENT and HNS Unit of the Yaoundé Central Hospital. Department of Otolaryngology and Head and Neck Surgery-Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I, Yaoundé-Cameroon, Email address: roger_meva@yahoo.fr, Tel: (+237) 699831970, Orcid id: <https://orcid.org/0000-0003-2172-1547>

Key words: Informed consent, surgical patients, information content, information adequacy, Yaoundé

Mots-clés : Consentement éclairé, patients chirurgicaux, contenu de l'information, adéquation de l'information, Yaoundé

Date de soumission: 07/07/2025
Date d'acceptation: 09/12/2025

ABSTRACT

Introduction: Our study aimed to evaluate the practice of informed consent among patients undergoing surgery.

Patients and methods: This cross-sectional survey was conducted in seven surgical units at Yaoundé Central Hospital (YCH). A 14-item structured questionnaire was administered to explore the content and adequacy of the information provided to patients and the methods used to obtain consent. Data on age, sex, responses to the questions, and adequacy score were collected and analyzed using SPSS.

Results: One hundred and fifty-five patients were recruited. The mean age of patients was 37.38 ± 21.26 years, with 80.6% being men. Participants were informed of their diagnosis ($n=153$, 98.7%), of the nature and purpose of the surgery ($n=139$, 89.7%), of the expected benefits ($n=150$, 96.8%), of the type of anesthesia ($n=137$, 88.4%), of the anesthetic risks ($n=127$, 81.9%), of the need for postoperative medication ($n=124$, 80%), and of the outcome if surgery was refused ($n=132$, 85.2%). Only 42 participants (27.1%) had been informed of the risks and complications of surgery. The information adequacy score was statistically higher in ENT-HNS units ($p=0.006$) and Maternity ($p < 0.001$). A total of 151 (97.41%) participants had signed a consent form.

Conclusion: The process of obtaining consent for surgery was satisfactory, although the information provided to the patient was incomplete.

RESUME

Introduction : L'objectif de l'étude était d'évaluer le processus d'obtention du consentement éclairé chez les patients opérés.

Patients et méthodes : Il s'agissait d'une étude transversale menée à l'Hôpital Central de Yaoundé. Un questionnaire structuré de 14 items a été administré afin d'explorer le contenu et la pertinence de l'information prodiguée aux patients, ainsi que les méthodes utilisées pour obtenir leur consentement. L'âge, le sexe, les réponses aux questions et le score d'adéquation de l'information ont été collectés et analysés à l'aide du logiciel SPSS.

Résultats : Au total 155 patients ont été retenus. L'âge moyen des patients était de $37,38 \pm 21,26$ ans et 80,6 % étaient du sexe masculin. Les participants ont été informés de leur diagnostic ($n=153$, 98,7 %), de la nature et du but de l'intervention chirurgicale ($n=139$, 89,7 %), des bénéfices attendus ($n=150$, 96,8 %), du type d'anesthésie ($n=137$, 88,4 %), des risques anesthésiques ($n=127$, 81,9 %), de la nécessité d'un traitement postopératoire ($n=124$, 80 %), et de l'issue en cas de refus de la chirurgie ($n=132$, 85,2 %). Le score d'adéquation de l'information était plus élevé dans les unités ORL-CCF ($p = 0,006$) et à la maternité ($p < 0,001$). Au total 151 patients (97,41 %) avaient signé un formulaire de consentement.

Conclusion : Le processus d'obtention du consentement pour la chirurgie a été satisfaisant bien que le contenu de l'information prodiguée aux patients soit incomplet.

DOI : <https://doi.org/10.64294/jsd.v3i4.199>

Introduction

The medical field is complex and demanding, inherently involving risk and uncertainty, and closely connected to lifelong suffering and death. Consequently, even minor errors can make a doctor legally responsible [1]. Medical liability encompasses various forms, including disciplinary, administrative, civil, and criminal, with some overlaps between them [1]. In the latter half of the 20th century, the rise of patients' rights prompted notable shifts in medical practice, fundamentally transforming the doctor-patient relationship [2]. Starting in 1960, global protests emerged, marking a shift away from paternalism towards greater respect for patient autonomy, seen as a sign of progress [3].

Informed consent involves sharing crucial information with patients, enabling them to make informed, rational choices among various options they believe are in their best interests [4]. Over the past 25 years, there has been a growing consensus that the importance of informed consent has increased as medical practice has become more formalized [5]. Its primary aim before an intervention is to uphold and reinforce the patient's sense of autonomy. The process must allow patients to decline and to be informed of alternative options when available. Proper informed consent is key to addressing patients' questions, easing their anxiety, and preparing them for the procedure [6]. The idea of informed consent is especially associated with surgical fields because patients must decide whether to undergo surgery, and surgeons must authorize the procedure [7]. Central to this process is providing relevant, adequate, and clear information so patients can make informed decisions about surgery. To do this effectively, surgeons must have the skills to evaluate whether patients can understand and use the information. They must also deliver unbiased, non-coercive clinical details. For instance, while consent is often obtained right before surgery [8,9], some places use structured interviews, leaflets, electronic systems, or multimedia tools to improve the process. Recent reviews indicate that research on surgical informed consent remains limited and largely unrobust [10-13].

A properly conducted informed consent process for surgery is an interactive, structured process that results in fully informed patients who are capable of making an informed decision about the risks and benefits of treatment, alternative treatment options, or postponing surgery [14]. Inadequate informed consent to surgery compromises patient autonomy, creates potential risks, decreases patient satisfaction and trust in their surgeon, and thus jeopardizes the patient-physician relationship. In addition, breach of informed consent to surgery can result in a disciplinary tribunal, assault or battery [15]. Although improvements in informed consent to surgery

have been achieved in recent years, other studies suggest that implementation of informed consent to surgery is still sub-optimal in surgical practice [16]. Informed consent is not only necessary from an ethical and legal point of view, but also effective in terms of quality of care, patient understanding and cooperation, improved outcomes, and satisfactory medical treatment, and it contributes to the prevention of errors [17] and harmony in the career-patient relationship.

Changes in legal status and new consent guidelines have influenced medical culture, requiring doctors to adapt [18]. Not providing sufficient information can lead to liability for the doctor and may also violate the patient's consent [19]. For many years, doctors in Cameroon experienced virtual immunity. However, medical malpractice lawsuits have recently increased, prompting lawyers and doctors to pay close attention to the issue. This study aimed to assess how informed consent is practiced in the surgical departments of Yaoundé Central Hospital and to raise surgeons' awareness of the importance of obtaining informed consent and of understanding the legal consequences of failing to provide proper information or consent.

Patients and methods

This was a cross-sectional study conducted from 1st April to 30th June 2024 in seven units providing surgical care at the Yaoundé Central Hospital: Ear, Nose, and Throat and Head and Neck Surgery (ENT-HNS), General Surgery, Traumatology, Maternity, Pediatric Surgery, Neurosurgery, and Urology. This work concerned patients operated on at Yaoundé Central Hospital, selected non-probabilistically. All patients hospitalized after surgery and who had consented to participate were included. Patients unable to give consent were excluded, as those who were unconscious in the postoperative period, and minors whose parents/guardians or careers were absent at the time of our visits. We created a survey form with three sections: one for information and consent to participate; another for collecting sociodemographic and clinical data from daily pre-anesthetic visit forms; and a modified, adapted, and previously tested semi-structured questionnaire [20]. The questionnaire comprised 14 questions to which patients responded 'yes' or 'no'. Questions 2 to 13 pertained to the content of the information provided regarding the surgical treatment (diagnosis justifying the surgery, nature and purpose of the operation, expected benefits, duration of the operation, potential surgical risks and complications, therapeutic alternatives, type of anesthesia, possible anesthetic risks and complications, medication taken in the postoperative period, natural course without surgical treatment, satisfaction with the information given, and opportunity to ask questions). Questions 1 and

14 concerned obtaining consent (verbal agreement, signing a form). The adequacy of the information provided to the patients was evaluated using a score validated in a prior study [21]. One point was awarded for each positive response to questions 2-13. The information was deemed unacceptable for a score below 4 points; acceptable for a score between 4 and 7 points; and suitable for a score between 8 and 12 points. On the first postoperative day, during ward visits, interviews were conducted with the patients, their parents or guardians, and careers. Three categories of data were gathered: socio-demographic details (age, sex, department of origin), responses to the questions, and the score assessing the adequacy of the information provided. Statistical data analyses were performed using SPSS version 22.0 software (SPSS Inc., Chicago, Illinois). Quantitative variables were described by their mean and standard deviation, or by their median and interquartile range. Qualitative variables were described by giving their numbers and percentages. Student's t-test and Chi-square test were used to compare variables. The significance threshold was set at a p-value of <0.05.

Results

The sample included 155 participants: 125 men (80.6%) and 30 women (19.4%). The mean age was 37.38 with a standard deviation of 21.26 years, ranging from one week to 87 years; 126 participants (81.29%) were 20 or older (Table 1).

Table1: distribution of general characteristics of participants (N = 155)

Variables	n	%
Age ranges (years)		
0-9	17	11.0
10-19	12	7.7
20-29	29	18.7
30-39	27	2717.4
40-49	24	15.5
50-59	18	11.6
60-69	14	9.0
70-79	10	6.5
≥80	4	2.6
Gender		
Female	30	19.4
Male	125	80.6
Surgical unit of origin		
Neurosurgery	37	23.9
Traumatology	34	21.9)
Urology	26	16.8
Digestive surgery	25	16.1
ENT-HNS	22	14.2
Maternity	6	3.9
Paediatric surgery	5	3.2

ENT-HNS : Ear Nose and Throat and Head and Neck

Although most participants knew their diagnosis, and the nature and purpose of the operation were explained in nearly all departments (about 94% in Traumatology, Neurosurgery, ENT-CCF, and Urology), there were notable gaps in essential information, as shown in Table 2:

Table 2: distribution of answers to questions 2 to 13 among the study population (N = 155)

Questions	Yes n (%)	No n (%)
2. Have you been informed of the diagnosis?	153(98.7)	2(1.3)
3. Have you been informed about the nature and purpose of surgery?	139(89.7)	16(10.3)
4. Have you been told what benefits you expect at the end of this surgery?	150(96.8)	5(3.2)
5. Have you been informed about the approximate duration of the procedure?	32(20.6)	123(79.4)
6. Have you been informed of possible complications and risks during and after surgery?	42(27.1)	113(72.9)
7. Have you been informed about the existence of alternative treatments?	19(12.3)	136(87.7)
8. Have you been informed about the type of anaesthesia for this surgery?	137(88.4)	18(11.6)
9. Have you been informed about the complications and risks of anaesthesia?	127(81.9)	28(18.1)
10. Have you been informed about the need for medication after surgery?	124(80)	31(20)
11. Have you been informed of the evolution of your disease if you choose not to have surgery?	132(85.2)	23(14.8)
12. Are you satisfied with the information you have been given?	148(95.5)	7(4.5)
13. Did you have the opportunity to ask any questions?	147(9.8)	8(5.2)

- In 79.4% of cases (123 participants), information about the duration of the operation was missing.

- In 72.9% of cases (113 participants), information regarding the risks and complications of the surgery was absent.

- Information about alternative treatments was absent in 87.7% of cases (136 participants).

- Information about complications and risks was significantly lacking in Visceral (92% uninformed, $p = 0.025$) and ENT-CCF (36.4% uninformed, $p < 0.001$).

- The Maternity ward notably lacked information on the type of anesthesia, with 83.3% not informed ($p = 0.001$), and on its complications, with 83.3% not

informed ($p = 0.001$).

- Information regarding the progression of the pathology without surgery was significantly missing in the Maternity Unit, with 50% not being informed ($p = 0.043$).

Table 3: distribution of the adequacy scores of the information provided to the participants among the surgical units.

Surgical units	Provided information adequacy Score		p value
	Mean (standard deviation)		
Ear, Nose, and Throat and Head and Neck Surgery (ENT-HNS)	9.6 (1)	0.006	
General surgery	8.3 (1,7)	0.227	
Traumatology	8.6 (1,3)	0,745	
Maternity	6 (3,2)	<0,001	
Paediatric surgery	8.6 (2,3)	0.893	
Neurochirurgie	8.8 (1,7)	0.589	
Urology	8.8 (1,7)	0.646	

Table 3 demonstrates that the average score for the adequacy of information was high, mostly exceeding 8 out of 10 across nearly all surgical units, except for the Maternity Unit, where it was considerably lower ($p < 0.001$). Most participants expressed satisfaction with the overall information, with over 92% in most departments (Table 4).

Table 4: distribution of adequacy levels of information provided to participants among the surgical units (N = 155)

Surgical units	Levels of adequacy of the information supplied			p-value
	Unacceptable (AS < 4)	Acceptable (AS: 4 to 7)	Good (AS: 8 to 12)	
	n (%)	n (%)	n (%)	
Ear Nose and Throat and Head and Neck Surgery (ENT-HNS)	0(0)	1(4,5)	21(95,5)	0,142
Digestive surgery	0(0)	6(24)	19(76)	0,544
Traumatology	0(0)	7(20,6)	27(79,4)	0,607
Maternity	2(33,3)	3(50)	1(16,7)	<0,001
Paediatric surgery	0(0)	2(40)	3(60)	0,420
Neurochirurgie	1(2,7)	4(10,8)	32(86,5)	0,403
Urology	0(0)	5(19,2)	21(80,8)	0,730

AS : adequacy score

Nearly all participants (152, 98%) provided verbal consent, and a large majority (151, 97.41%) also signed a consent form (Figures 1 and 2).

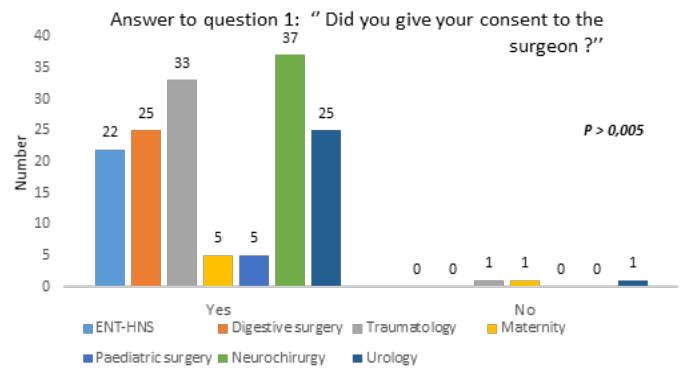


Figure 1: distribution of responses to question 1 among participants in the surgical units

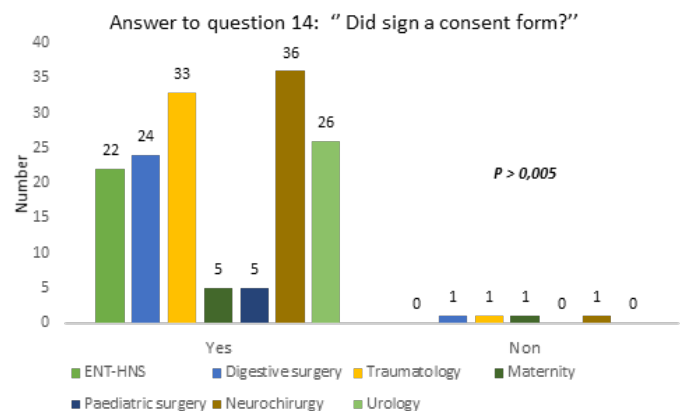


Figure 2: distribution of responses to question 14 among participants in the surgical units

Discussion

Informed consent is a process by which a mentally competent patient agrees to undergo surgery after being informed of indications, alternatives, potential side effects, and complications [22]. The vast majority of patients and their relatives in the current study were over 20 years of age. They were interviewed during the postoperative period, unlike Burkle et al. [23], who administered their questionnaire in the preoperative period. While they argue that their procedure minimizes bias related to the patient's ability to remember the information received [23], we believe that it does not account for the factors that would have led to the decision-making after the patient's personal reflection.

The patient consents to the surgery after receiving complete information about the nature of the procedure, its indications, other available treatment options, its benefits and complications, and the consequences of not having the procedure [24]. The present study shows that 98.7% of the participants had been informed of their diagnosis, 89.7% of the nature and purpose of the surgery, 96.8% of the expected benefits, more than 80% of the evolution of the pathology in the absence of surgery and the need for postoperative medication. We note that the surgeons emphasize explaining the first two elements (diagnosis, nature of the surgery) since

our results corroborate those of Ogundiran et al., for whom 93.75% of patients and their relatives had been informed of their diagnosis and 85% of the nature of the intervention performed [20].

However, many patients in their series were unaware of the expected benefits [25]. We believe this situation results from a misunderstanding on the part of the patient or an omission by the professional responsible for providing information. In this regard, many authors agree that certain aspects of information should be communicated by surgeons with proven experience [26]. Pittalis et al., observed that a detailed explanation of possible complications can scare some patients [21]. This might explain why information as crucial as anesthetic risks is missing in some series. While the type and risks of anesthesia were explained to 80% of the participants in our study, only 15% of the patients benefited from this in the survey by Shafique et al., [27].

The essential pieces of information lacking among the participants in our study were the duration of the surgery in 79.4% of cases, the risks and complications of the surgery in 72.9% of cases and the existence of alternative treatments in 87.7% of cases. Patients in our study seemed to be less informed about these aspects than those in others series. Chia et al., [28] reported that 54% of patients had not received information about potential complications of elective abdominal surgery; Shafique et al., showed that 69.3% of patients had not received any information about surgical risks [29]. It could be that our patients, as well as those in the Dogan et al. study, did not recall receiving information about complications or alternative treatments, due to an omission in the doctor's explanations or difficulties in understanding and assimilating [29]. Although 95.5% of our patients were satisfied with the information received, 94.8% had the opportunity to ask questions. The provision of complete and understandable information can be ensured through audio-visual materials, brochures [30], and asking patients to repeat what they have understood from the information provided [31]. The information provided to the participants in the present study was good/adequate in 80% of cases; almost all (95.5%) were satisfied with it. This is contrary to the result of Aisuodionoe-Shadrach et al., who showed that although the information obtained by patients was considered good, satisfaction with all the information provided was marginal in 35% of cases [31].

Although 98% of participants in our study gave verbal consent for surgery and 97.41% signed a form, we agree with Akkad et al., [32] that patients' needs may not be met, and that some patients may even consent to an operation they do not want. This confirms that patients do not understand the consent process, but accept it.

Our study had some limitations to consider when

interpreting the results. It was carried out only in a few surgical departments at the YCH, which has twelve in total. This reduced the number of patients that could have been obtained, on the one hand, and compromised the representativeness of the sample, on the other. This explains our choice for a non-probability sampling technique.

Patient and/or surgeon-related factors related to understanding the information provided and the communication process were not considered. They would have shed light on specific results. Nevertheless, it merits recognition for having opened up an area for reflection on a delicate subject in surgical practice: the patient-caregiver relationship, which is concretized by the signing of informed consent, and for having identified critical aspects lacking in the information provided to operated patients.

Conclusion

In the present study, informed consent was obtained satisfactorily: over two-thirds of patients received adequate information. However, the content of the information provided was incomplete, covering only nine out of twelve crucial aspects for informed decision-making. Patients provided their consent both verbally and in writing, demonstrating the surgeons at Yaoundé Central Hospital's commitment to respecting patient autonomy and ensuring informed choices.

Conflict of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding: The authors declare that they have no received funding for this paper.

Author's Contributions: Conception: RCMB, GFON, FENT. Design: RCMB, GFON, FENT. Supervision: DME, ONNM, ENE. Materials: RCMB. Data Collection and/or Processing: RCMB, BMK, ENFO. Analysis and/or Interpretation: RCMB. Literature Review: RCMB, LM, YM, LCA. Writing: RCMB. Critical Review: GFON, FENT, LCA, YM, DME, ENE.

References

- Bertrand S. La responsabilité juridique des médecins face aux erreurs médicales : enjeux et conséquences [Internet]. Guides Juridiques. [Cité 6 déc. 2025]. Disponible sur : <https://www.guides-juridiques.fr/la-responsabilite-juridique-des-medecins-face-aux-erreurs-medicales-enjeux-et-sequences/>
- Manāi D. Les droits du patient face à la biomédecine. Bern: Stämpfli-Verl.; 2006. 547 p.
- Niyogi A, Clarke SA. Elective paediatric surgery: what do parents really want to know? Scott Med J. 2012 May;57(2):65-8. doi: 10.1258/smj.2012.012002. PMID: 22555224.
- Shah P, Thornton I, Kopitnik NL, Hipskind JE. Informed Consent. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cité six déc 2025]. Disponible sur: <http://www.ncbi.nlm.nih.gov/books/NBK430827/>

5. Faden R, Beauchamp T. A history and theory of informed consent. New York: Oxford University Press, 1986.
6. Pugliese OT, Solari JL, Ferreres AR. The extent of surgical patients' understanding. *World J Surg*. 2014 Jul;38(7):1605-9. doi: 10.1007/s00268-014-2561-8. PMID: 24722867.
7. Angelos P, Lafreniere R, Murphy TF, et al. Ethical issues in surgical treatment and research. *Curr Probl Surg* 2003;40:353e448.
8. Adisa AO, Onakpoya UU, Oladele AO, et al. Informed consent in surgery: an audit of practice in Ile-Ife, Nigeria. *Niger J Clin Pract* 2008;11:206e10.
9. Osime OC, Okojie O, Osadolor F, et al. Current practices and medico-legal aspects of pre-operative consent. *East Afr Med J* 2004;81:331e5]. [Aisuodionoe-Shadrach OI, Ogunlade OS, Amoran OE. An evaluation of the informed consent process for elective surgery at a university hospital. *Niger J Med* 2006;15:281e4.
10. Perić O, Mišić M, Tirić D, Penava N, Bušić D, Tomić V. Patients' experience regarding informed consent in elective and emergency surgeries. *Med Glas (Zenica)*. 1 août 2018;15(2):179-85.
11. Ezeome ER, Chuke PI, Ezeome IV. Contents and readability of currently used surgical/procedure-informed consent forms in Nigerian tertiary health institutions. *Niger J Clin Pract*. 2011 Jul-Sep;14(3):311-7. doi: 10.4103/1119-3077.86775. PMID: 22037076.
12. Oosthuizen JC, Burns P, Timon C. The changing face of informed surgical consent. *J Laryngol Otol*. 2012 Mar;126(3):236-9. doi: 10.1017/S0022215111003021. Epub 2011 Nov 4. PMID: 22051081. Jimison HB, Sher PP, Appleyard R, et al. The use of multimedia in the informed consent process. *J Am Med Inform Assoc* 1998;5:245e56.
13. Leclercq WK, Keulers BJ, Scheltinga MR, Spauwen PH, van der Wilt GJ: A review of surgical informed consent: past, present, and future. A quest to help patients make better decisions. *World J Surg* 2010, 34:1406–1415;
14. Convie LJ, Carson E, McCusker D, McCain RS, McKinley N, Campbell WJ, Kirk SJ, Clarke M. The patient and clinician experience of informed consent for surgery: a systematic review of the qualitative evidence. *BMC Med Ethics*. 2020 Jul 11;21(1):58. Doi: 10.1186/s12910-020-00501-6. PMID: 32653008; PMCID: PMC7353438.
15. Schenker Y, Fernandez A, Sudore R, Schillinger D: Interventions to improve patient comprehension in informed consent for medical and surgical procedures: a systematic review. *Med Decis Making* 2011, 31:151-173.
16. Schenker Y, Meisel A: Informed consent in clinical care: practical considerations in the effort to achieve ethical goals. *JAMA* 2011, 305:1130–1131.
17. Faghanipour S, Joolae S, Sobhani M. Surgical informed consent in Iran--how much is it informed? *Nurs Ethics*. 2014 May;21(3):314-22. doi: 10.1177/0969733013498525. Epub 2013 Oct 21. PMID: 24145110.
18. GOV.UK [Internet]. [cité 6 déc. 2025]. Reference guide to consent for examination or treatment (second edition). Disponible sur: <https://www.gov.uk/government/publications/reference-guide-to-consent-for-examination-or-treatment-second-edition>
19. chieng J, Ibingira C, Buwembo W, Munabi I, Kiryowa H, Kitara D, Bukuluki P, Nzarubara G, Mwaka E. Informed consent practices for surgical care at university teaching hospitals: a case in a low-resource setting. *BMC Med Ethics*. 2014 May 19;15:40. Doi: 10.1186/1472-6939-15-40. PMID: 24885609; PMCID: PMC4068318.
20. Ogundiran TO, Adebamowo CA. Surgeons' opinions and practice of informed consent in Nigeria. *J Med Ethics*. 2010 Dec;36(12):741-5. doi: 10.1136/jme . 2010.037440. Epub 2010 Oct 12. PMID: 20940174; PMCID: PMC3332031.
21. Pittalis C, Sackey C, Okeny P, Nandi B, Gajewski J. Surgical informed consent practices and influencing factors in sub-Saharan Africa: a scoping review of the literature. *BMJ Qual Saf*. 2024 Sep 19;33(10):653-662. doi: 10.1136/bmjqs-2023-016823. PMID: 38160058; PMCID: PMC11503148.
22. Arellano L, Alcubilla P, Leguizamo L. Ethical considerations in informed consent. In: *Ethics - Scientific Research, Ethical Issues, Artificial Intelligence and Education [Working Title]* [Internet]. IntechOpen, 2023 [cité le 6 déc. 2025]. Disponible sur: <https://www.intechopen.com/online-first/1123544>
23. Burkle CM, Pasternak JJ, Armstrong MH, Keegan MT. Patient perspectives on informed consent for anaesthesia and surgery: American attitudes. *Acta Anaesthesiol Scand* 2013;57:342–349.
24. Ng IK. Informed consent in clinical practice: Old problems, new challenges. *J R Coll Physicians Edinb*. 2024 Jun;54(2):153-158. doi: 10.1177/14782715241247087. Epub 2024 Apr 14. PMID: 38616290.
25. Fusetti C, Lazzaro M, Trobia M, Lucchina S, Petri J, Garavaglia G. Patients' point of view on informed consent: a prospective study in carpal tunnel surgery. *Am J Orthop (Belle Mead, NJ)*. 2013 Dec;42(12):E111-5. PMID: 24471151.
26. Hallock JL, Rios R, Handa VL. Patient satisfaction and informed consent for surgery. *Am J Obstet Gynecol*. 2017 Aug;217(2):181.e1-181.e7. doi: 10.1016/j.ajog.2017.03.020. Epub 2017 Mar 28. PMID: 28363439.
27. Shafique MU, Saleem MS, Saghir M, Javaid MS, Saad M, Sadiq A, Shibli HU, Khalid MA, Saleem F. An Audit of Preoperative Informed Consent in Surgical Patients at a Tertiary Care Hospital in Lahore, Pakistan. *Cureus*. 2023 Dec 7;15(12):e50122. doi: 10.7759/cureus . 50122. PMID: 38192963; PMCID: PMC10771937.
28. Chia CLK, Chan KS, Ng MJM, Rao AD, Singaporewalla R. Assessing adequacy of informed consent for elective surgery by student-administered interview. *ANZ J Surg*. 2019 Jun;89(6):677-682. doi: 10.1111/ans.15214. Epub 2019 May 14. PMID: 31090182.
29. Dogan HH, Işık E, Vural E, Vehid H, Brezis M. Quality and extent of informed consent for invasive procedures: a pilot study at the institutional level in Turkey. *Int J Qual Health Care*. 2015 Feb;27(1):46-51. doi: 10.1093/intqhc/mzu093. Epub 2014 Dec 10. PMID: 25502322.
30. Aremu SK, Alabi BS, Segun-Busari S. The role of informed consent in risk recall in otorhinolaryngology surgeries: verbal (nonintervention) vs written (intervention) summaries of risks. *Am J Otolaryngol*. 2011 Nov-Dec;32(6):485-9. doi: 10.1016/j.amjoto.2010.09.012. Epub 2010 Nov 19. PMID: 21093107.
31. Aisuodionoe-Shadrach OI, Oganlade OS, Amoran OE. An evaluation of the informed consent process for elective surgery at a university hospital. *Niger J Med* 2006;15:281–284.
32. Akkad A, Jackson C, Kenyon S, et al. Patients' perceptions of written consent: questionnaire study. *BMJ* 2006;333:528.



A Rare Postpartum Presentation of Appendiceal Rupture Concealed by Uterine Myoma: a case report

Une présentation rare en période postpartum d'une rupture appendiculaire masquée par un fibrome utérin : à propos d'un cas clinique

Christiane Jivir F Nsahlai^{1,2}, Mpono Emenguele P^{1,3}, Nyada SR^{1,3}, Ngono Akam Marga V^{1,3}, Mboua Batoum VS^{1,4}, Ebong Ebontane C^{1,5}, Mve Koh V^{1,4}

Clinical Case

1. Department of Obstetrics and Gynecology, Faculty of Medicine and Biomedical Sciences, The University of Yaoundé I,
2. Essos Hospital Center, Yaoundé
3. Gynaecological Endoscopic Surgery and Human Reproductive Teaching Hospital, Yaoundé
4. University Teaching Hospital
5. Yaoundé Central Hospital

Corresponding author:

Christiane Jivir Fomu Nsahlai,
Faculty of Medicine and Biomedical Sciences, The University of Yaoundé I, PO Box 1364, Yaoundé. Tel : (+237) 670 217 703, Email: cnsahlai1974@gmail.com; christiane.nsahlai@fmsb-uy1.cm

Key words: post-partum; acute appendicitis; laparotomy, myoma

Mots clés : post-partum ; appendicite aiguë ; laparotomie ; myome

Date de soumission: 22/10/2025

Date d'acceptation: 3/12/2025

ABSTRACT

A 31-year-old primiparous woman developed acute abdomen 12 hours post vaginal delivery. Emergency laparotomy revealed 2000 mL of pus and a necrotic myoma tamponading a ruptured appendix. Myomectomy, peritoneal lavage, and bowel exploration were performed. Postoperative wound infection was managed with antibiotics and local care. Recovery was favorable at eight weeks. This case highlights the diagnostic challenges of postpartum appendicitis, often masked by physiological changes. Early surgical intervention and multidisciplinary management are essential for optimal outcomes.

RESUME

Une femme primipare de 31 ans a développé un abdomen aigu 12 heures après un accouchement par voie basse. Une laparotomie d'urgence a révélé la présence de 2 000 ml de pus et d'un myome nécrotique tamponnant un appendice rompu. Une myomectomie, un lavage péritonéal et une exploration intestinale ont été réalisés. L'infection postopératoire de la plaie a été traitée par antibiotiques et soins locaux. La guérison a été favorable au bout de huit semaines. Ce cas met en évidence les difficultés diagnostiques de l'appendicite post-partum, souvent masquée par des changements physiologiques. Une intervention chirurgicale précoce et une prise en charge multidisciplinaire sont essentielles pour obtenir des résultats optimaux.

DOI : <https://doi.org/10.64294/jsd.v3i4.200>

Introduction

The postpartum period is a critical phase in maternal recovery, during which various physiological changes and potential complications may arise. While abdominal discomfort is common after delivery, the occurrence of acute abdomen in the immediate postpartum period is rare and often poses a significant diagnostic challenge. Acute abdomen refers to a sudden onset of severe abdominal pain that may require urgent surgical intervention. In postpartum women, its etiology can be diverse, ranging from obstetric causes such as uterine rupture or retained placental fragments, to non-obstetric conditions like bowel obstruction, appendicitis, or intra-abdominal hemorrhage (1). Even rarer conditions have been reported such as, rupture of a urachal cyst, ruptured hydatid liver cyst and ovarian vein thrombosis mimicking acute appendicitis postpartum, and presenting as an acute abdomen (2–4). Prompt recognition and management are essential to prevent maternal morbidity and mortality. However, the overlapping symptoms with normal postpartum recovery can delay diagnosis. This case report highlights an unusual presentation of acute abdomen shortly after delivery, emphasizing the importance of clinical vigilance, timely imaging, and multidisciplinary collaboration in postpartum care.

We are hereby presenting a very rare case of immediate postpartum acute abdomen secondary to a ruptured appendix, which posed diagnostic and management dilemmas, especially as she was referred. The abdominal pain and tenderness can be easily misinterpreted as afterpains and management delayed resulting in morbidity or mortality.

Case Presentation

We report the case of a 31-year-old primiparous woman (G1P1001) referred for severe abdominal pain 12 hours after vaginal delivery induced with Misoprostol (50 µg every 6 hours for 18 hours), resulting in a healthy newborn (3500 g). On examination, she was afebrile with stable vitals but in significant distress, showing diffuse abdominal tenderness with guarding and rebound. Genitourinary findings were normal, and laboratory investigations were unremarkable. Pelvic ultrasound revealed a 3 cm posterior uterine rupture, prompting emergency laparotomy.

Intraoperatively, 2000 mL of pus was evacuated. The uterus was intact, but posteriorly a necrotic sessile myoma was found tamponading a ruptured appendix. A myomectomy was performed, and bowel loops were explored with a digestive surgeon. After thorough lavage, a passive drain was placed, yielding <30 mL of serosanguinous fluid daily from postoperative days 1 to 3, and was removed on day 4. However, on postoperative day 5, the patient developed wound suppuration on day 5; sutures were partially removed, antibiotics adjusted based

on culture, and wound care initiated. At eight weeks, she was clinically stable with a well-progressing wound healing.

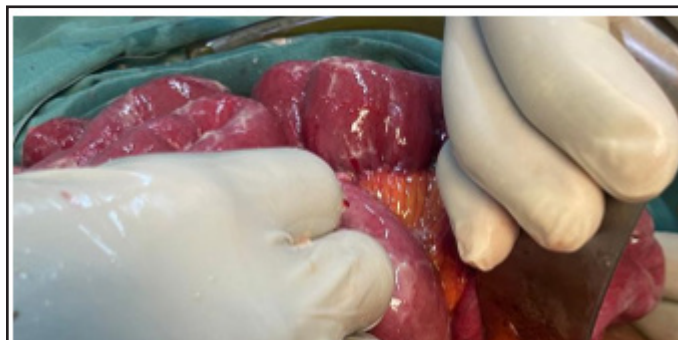


Figure 1: The image shows an intra-abdominal surgical field during a laparotomy. The upper part of the image corresponds to the cranial direction of the patient, and the lower part to the caudal. Small bowel loops are visible, gently retracted above. Purulent fluid with an orange appearance is collected in the peritoneal cavity as shown by the arrow.

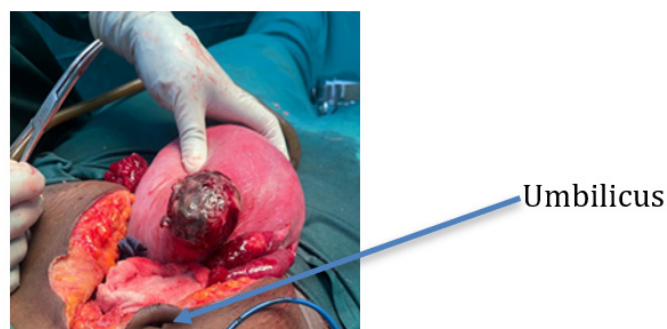


Figure 2: The image shows the intra-abdominal surgical field during laparotomy with view from patient's head downwards. Lower left aspect of image is cranial and caudal to the right, upper part. The exteriorized uterus is the large, round and pink structure with its posterior wall visible. A necrotic, sessile myoma – the dark, irregular mass is visualized on the uterine wall. No evidence of posterior uterine rupture.

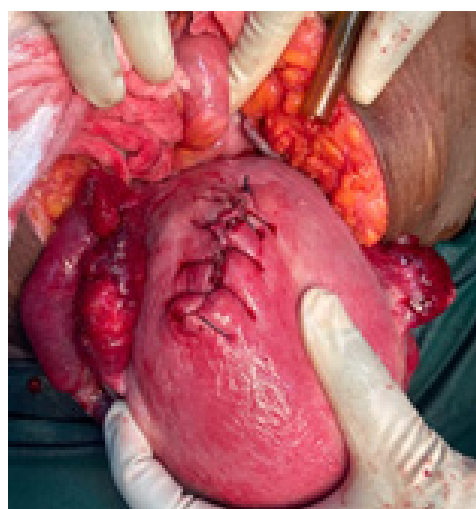


Figure 3: Bottom of the image is cranial and top of the image is caudal. The uterus is exteriorized and depicts a fresh suture line on the posterior wall following myomectomy. Suture lines – indicate closure of the myoma bed after removal of the necrotic fibroid.

Discussion

Acute abdomen in the immediate postpartum period is a rare but critical presentation that demands prompt evaluation and intervention as exemplified by case reports/series (5,6). In this case, a ruptured appendix that complicated the post-partum course by an intra-abdominal infection illustrates the diagnostic and therapeutic challenges in postpartum surgical emergencies. Major challenges include timely referral to tertiary care and adequate training to distinguish afterpains from serious pathology.

The presence of 2000 mLs of purulent fluid and pseudomembranes indicated advanced intra-abdominal infection, likely secondary to appendiceal rupture. Appendicitis in pregnancy and postpartum is uncommon but can be masked by overlapping symptoms such as uterine involution and gastrointestinal changes (7). Furthermore, overlap between physiologic and pathologic postpartum uterine changes complicates ultrasound interpretation (8), prompting the use of CT or MRI in high-income countries. Paraclinical tests including C-reactive protein, CRP and complete blood count (CBC) for leukocytosis provide nonspecific evidence of inflammation and are rarely decisive in the acute setting, instead serving mainly for follow-up. We did not obtain these investigations preoperatively owing to financial constraints. The necrotic sessile myoma tamponading the appendix, a distinctive finding in our case that has not previously been reported in the literature, added complexity, suggesting a mechanical contribution to delayed appendiceal perforation. The surgical approach—combining myomectomy, peritoneal lavage, and intestinal exploration—was essential to control the infection and prevent further complications. Collaboration with a digestive surgeon ensured comprehensive management of the gastrointestinal component.

Delayed diagnosis and management in such cases highlight the clinical uncertainty encountered when evaluating acute abdomen in the postpartum period, however, most patients fare well postoperatively with only few mortalities reported in the literature (2,9–11).

Postoperative wound infection is not an uncommon complication in sub-Saharan African with a relatively high frequency as reported by Yadeta et al. (12). One of the risk factors in our case was the contaminated surgery, which was managed effectively with culture-guided antibiotics and local wound care. The patient's favorable recovery at eight weeks highlights the importance of multidisciplinary care, early surgical intervention, and close postoperative monitoring.

This case underscores the need for improved diagnostic vigilance in postpartum patients, where anatomical and physiological changes may obscure classical presentations of acute appendicitis resulting in rupture. Mahajan et al. demonstrated that female sex

is independently associated with a higher likelihood of missed appendicitis diagnoses in the emergency department (9). Given the diagnostic challenges unique to pregnancy—such as displacement of the appendix by the gravid uterus and physiological leukocytosis—the risk of delayed or missed diagnosis is likely amplified in the peripartum period (13).

Conclusion

Acute abdomen resulting from ruptured appendix in the postpartum period is rare but easily missed due to overlapping physiological changes. This case highlights the risk of delayed diagnosis and severe complications of acute appendicitis, especially when confounding factors like a necrotic myoma are present. Timely surgical intervention and multidisciplinary care were essential for recovery. Given the increased likelihood of missed appendicitis in females, heightened clinical vigilance is crucial during the peripartum period.

References

1. Dembélé S, Samaké M, Dianessy Y, Guire A, Saye A, Diarra S, et al. Postpartum Surgical Emergency, in the General Surgery Department of the District Hospital of the Commune IV/ Bamako. *SAS J Surg*. 2024 May 10;10(05):552–5.
2. Bertoni M, Pintucci A, Locatelli A, Miranda A. Diffuse peritonitis secondary to urachal cyst abscess in a postpartum patient. *International Journal of Surgery Case Reports*. 2024 May;118:109584.
3. Ola M, Kenza H, Manal J, Amine C, Omar EA, Fatima Zahra L, et al. Peritonitis Secondary to Ruptured Hydatid Liver Cyst in a Young Postpartum Woman: A Rare Case Report. *Clin Med Insights Case Rep*. 2024 Jan;17:11795476241271561.
4. Talreja DP, Talreja RB, Elsayed AM, Albatanony AA. Postpartum right ovarian vein thrombosis mimicking acute appendicitis: a rare entity. *Int J Reprod Contracept Obstet Gynecol*. 2023 July 28;12(8):2540–3.
5. Waseem M, Cunningham-Deshong H, Gernsheimer J. Abdominal Pain in a Postpartum Patient. *The Journal of Emergency Medicine*. 2011 Sept;41(3):261–4.
6. Sheppeard R, Wilson C. Postpartum acute abdomen and its diagnostic challenges. *BMJ Case Reports*. 2015 Dec 15;2015:bcr2015212052.
7. Murray K, Drakes K, Best D. A late presentation of uterine rupture following a vaginal birth after cesarean section (VBAC): A case report. *J Case Rep Images Obstet Gynecol*. 2024 July 29;10(2):6–12.
8. Plunk M, Lee JH, Kani K, Dighe M. Imaging of Postpartum Complications: A Multimodality Review. *American Journal of Roentgenology*. 2013 Feb;200(2):W143–54.
9. Mahajan P, Basu T, Pai CW, Singh H, Petersen N, Bellolio MF, et al. Factors Associated With Potentially Missed Diagnosis of Appendicitis in the Emergency Department. *JAMA Netw Open*. 2020 Mar 9;3(3):e200612.
10. Amin R, Cruz J, Lee J. An Unusual Case of Abdominal Pain in the Postpartum Period: A Case Report of Vernix Caseosa Peritonitis. *AIM Clinical Cases*. 2025 Aug 1;4(8):e250024.
11. Mitchell KA, Haddock AJ, Husainy H, Walter LA, Rajapreyar I, Wingate M, et al. Care of the Postpartum Patient in the Emergency Department: A Systematic Review with

- Implications for Maternal Mortality. *Am J Perinatol*. 2023 Apr;40(05):489–507.
12. Yadeta DA, Manyazewal T, Demessie DB, Kleive D. Incidence and predictors of postoperative complications in Sub-Saharan Africa: a systematic review and meta-analysis. *Front Health Serv*. 2024 May 9;4:1353788.
 13. Rogers SO, Kirton OC. Acute Abdomen in the Modern Era. Longo DL, editor. *N Engl J Med*. 2024 July 4;391(1):60–7.





Avoidable death from complicated epigastric hernia in a resource limited setting

Mort évitable par une hernie de la ligne blanche compliquée en milieu défavorisée

Ewole Ella A.C^{1,2}, Kamto Kuatche T², Eya Stephane¹, Ndzie Hugues^{1,2}, Bengono Bengono R.S^{1,3}

Clinical Case

1. Faculty of Medicine and Pharmaceutical Sciences of Sangmelima
2. Surgery Unit, Sangmelima's Reference Hospital
3. Anesthesia and Intensive Care Unit, Sangmelima's Reference Hospital

Corresponding author : Ewole Ella Armand Collins, Surgery Unit, Sangmelima's Reference Hospital, PO Box 890, Sangmelima, Tel : ; email: eaacollins@gmail.com

Key words: epigastric hernia, strangulation, necrotizing fasciitis, sepsis, death

Mots-clés : hernie épigastrique, étranglement, fasciite nécrosante, sepsis, décès

Date de soumission: 22/09/2025

Date d'acceptation: 03/12/2025

ABSTRACT

An epigastric hernia is a defect in the ventral abdominal wall, that is often diagnosed under routine exam, and requires surgical management which if not undertaken may lead to strangulation. We present the case of a 20-year-old female of poor social setting, with no relevant past history who was brought to the emergency room with severe abdominal pains, fever and vomiting, of five days for which she had been taking traditional herbal medications. Upon physical examination she was clinically febrile, pale and septic, with signs of dehydration and hemodynamic instability. There was a necrotic supra-umbilical offensive ulcer and crepitus on almost the entire surface of the anterior abdominal wall. A working diagnosis of necrotizing fasciitis was made and she was planned for immediate surgery. Intraoperative findings were necrotizing fasciitis and necrosed loop of bowel in the anterior abdominal wall suggestive of strangulated hernia which worsened into necrotizing fasciitis. The postoperative period was marked by septic shock and death. Strangulated epigastric hernia remain a surgical emergency as it can be deadly if complicated. Care should be taken about the use of traditional medicine and proper counseling should be made to patients.

RESUME

Une hernie épigastrique est une lésion de la paroi abdominale antérieure nécessitant une prise en charge chirurgicale. En l'absence de traitement, elle peut se compliquer en un étranglement, voire le décès. Nous rapportons le cas d'une jeune femme de 20 ans, admise aux urgences pour des douleurs abdominales intenses, la fièvre et les vomissements, évoluant depuis cinq jours avec une notion de phytothérapie traditionnelle. L'examen physique présentait une pâleur cutanéomuqueuse, des signes de déshydratation et une instabilité hémodynamique. Un ulcère sus-ombilical nécrotique et malodorant et des crépitements sous-cutanés étaient présents sur la quasi-totalité de la paroi abdominale antérieure. Un diagnostic de fasciite nécrosante a été posé et une intervention chirurgicale réalisée. Les découvertes peropératoires ont révélé une fasciite nécrosante et une anse intestinale nécrosée dans la paroi abdominale antérieure, suggérant une strangulation intestinale sur hernie de la ligne blanche compliquée de fasciite. La période postopératoire était marquée par la survenue d'un choc septique et le décès. L'étranglement d'une hernie épigastrique reste une urgence chirurgicale, car il peut être mortel. Il convient d'être prudent quant à l'utilisation de la médecine traditionnelle et de prodiguer des conseils adaptés aux patients.

DOI : <https://doi.org/10.64294/jsd.v3i4.201>

Introduction

An epigastric hernia is a defect in the ventral abdominal wall, typically located midline above the umbilicus, and is often diagnosed during routine physical examinations [1]. About 65% of adult umbilical and epigastric hernias will require surgical treatment [1]. Even though epigastric hernias are asymptomatic, approximately 3% to 5% will necessitate emergency intervention due to incarceration or strangulation of intra-abdominal contents such as bowel [1,2]. Ideally, surgical repair should be performed before such complications occur. An epigastric hernia is not necessarily dangerous when it can be reduced, but may however develop complications if it gets strangulated. If it doesn't improve on its own, or if patients aren't able to push the hernia in, the contents of the hernia can be trapped (incarcerated) in the abdominal wall. An incarcerated hernia can become strangulated, which cuts off the blood flow to the tissue that's trapped and can lead to life-threatening complications. Excruciating pain due to ischemic changes in entrapped gastrointestinal tissue may endanger life. If surgical management is delayed, toxic materials from strangulated gut may spread and cause local sepsis or necrotizing fasciitis and further deterioration of the patient's overall general condition. Such irreversible complications may often cause the death of these patients [3]. We report a rare case of avoidable death from a patient who died from severe necrotizing fasciitis of the whole anterior abdominal wall a strangulated epigastric hernia in a low resource setting.

Patient presentation

We received a 20-year-old female in the emergency room after she was brought by an acquaintance of hers. She presented with an acute episode of generalized excruciating abdominal pains of five-day duration and severe lethargy. The patient reported that, history dated few months prior to consultation when she had a progressive onset of spasmodic supra-umbilical pains and swelling which were intermittent, for which she had beliefs of mystical origins and thus went for prayers and took herbal medications prescribed by a naturopathic doctor, with no formal diagnosis made. It is worth noting that her economic background was quite unfavorable too. five days prior to consultation, she had a sudden onset of a new episode but which this time was constant and rather spread to the whole anterior abdomen, associated with the development of a wound above the umbilicus. This was associated with spontaneous vomiting, fever and constipation. Her past medical history was relevant for an epigastric hernia diagnosed a few months back for which she had not undergone treatment. Physical exam revealed a clinically pale and septic patient, with signs of dehydration and hemodynamic instability. She had fever of 41°C, tachycardia 130 b/min, tachypnea 40

breaths/ min and BP of 92/50 mmHg. Her abdomen was mildly distended, moving with breathing bearing a large whitish fowl smelling ulcer midline above the umbilicus see Fig. 1. Palpation was painful and crepitations were felt beneath the skin throughout the entire abdominal wall. Deep palpation and percussion were not possible due to the pains, and no bowel sounds could be perceived upon auscultation.



Figure 1: patient's abdomen showing necrosed skin overlying the hernia area

Her blood workup was remarkable of severe leukocytosis with left shift 20,4 c/l and anemia Hb=8,4 g/dl and thrombopenia 58 c/l) on full blood. She had hypernatremia 140mmol/l and normal renal function. Plane abdominal x-ray showed multiple central air fluid levels characteristic of small bowel obstruction. A working diagnosis of necrotizing fasciitis of the anterior abdominal wall was made and she was programed for surgery after appropriate resuscitation. Intraoperative findings were necrotizing fasciitis interesting the fascial layer of the whole anterior abdominal wall with a loop of necrosed bowel in it see fig. 2-4,. The peritoneal cavity was totally spared without any sign of pus nor inflammation. An extensive debridement was made and an end to end anastomosis of the bowel endings observed after their edges were trimmed. Samples were collected for culture and histologic studies, and the patient was placed on broad spectrum postoperative antibiotherapy and sent to the intensive care unit. The post operative period was marked by persistence of the fever, evolution into a state of shock and she finally died on post operatory day two.

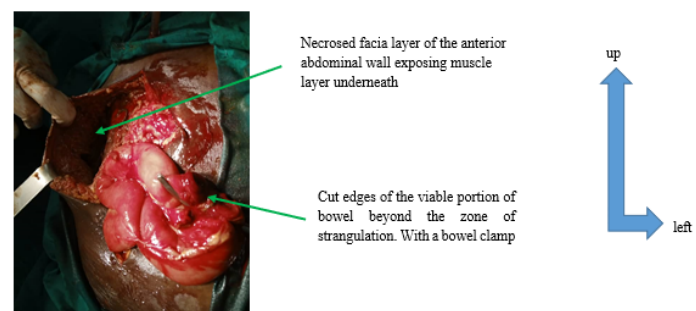


Figure 2: Intraoperative image showing incised abdominal wall with necrosed fascia layer of the anterior abdominal wall, and remnant cut edges from strangulated bowel

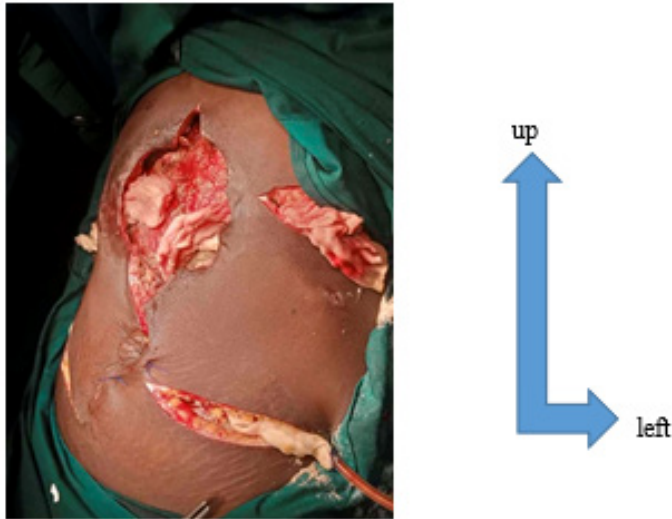


Figure 3: intraoperative image showing the extent of fascia necrosis with abdominal mops in between the subcutaneous and the muscle layer



Figure 4: necrosed bowel from debrided tissue

Discussion

Delay and refusal to surgical treatment are attitudes that exist in medical profession, worldwide in general and in the Africa in particular, there are a lot of beliefs that guide these behaviors in many patients. According to a study carried out in Bouake in ivory Coast by Loukou et al. financial constrains (58,5%), trust in traditional medicine (39,6%), and religious beliefs (1,9%) are the most common causes of this behavior [4,5]. This goes in line with the rundown of events by our patient, who, due to strong religio-magical beliefs on the one hand and financial constrains on the other hand turned herself towards traditional medicine, which unfortunately could not yield any satisfactory result with respect to the situation at hand. This therefore implies that a proper counselling should be given to patients with hernia about the fact that there is no other treatment than surgery, let them get the appropriate reassurance about the procedure and as for the cost, they should know that these surgeries are quite affordable.

Postoperative mortality was studied by Samrawith

et al. in Ethiopia and they found out that 54.2% of patients who died within 7 postoperative days died of septic shock, and the factors which influenced these early post-operative death included patients operated as emergency cases, patients with poor ASA performance score of 3 or more [6]. These conditions listed above correspond to those of our patient, cumulatively to the findings of Butterworth et al. who concluded that delay to emergency surgery increased the risk of high morbidity and mortality, even though their study involved only pediatric participants. All these factors could explain the fate of our patient. Therefore, counselling to timely management should be done towards every patient with an emergency surgical pathology.

Mindless of the progress in medical knowledge of herniae and the variety of surgical methods for treatment, we could see here that mortality due to epigastric herniae remain a reality even though there is lack of data to quantify this fact. Death due to a hernia was also described by Dongmo et al. and nilsson et al. by Dongmo et al. in Yaounde described a case of postoperative retroperitoneal hematoma due to an inguinal hernia repair [7,8] this prompts us to be aware of the fact that though considered trivial care must be taken when undertaking surgical care of a hernia

Conclusion

The strangulation of an epigastric hernia remains a surgical emergency as it can be deadly if complicated. A proper diagnosis is mandatory and counseling should be made to the general population about proper consultations when sick. For patient who present pathologies with no other treatment than surgery, they should be counselled about the potential complications of their condition. Care remains quite straight forward for a hernia when uncomplicated.

Conflict of interest:

The authors declare that they have no conflict of interests.

Authors' contributions:

Ewole Ella AC and Kamto Kuatche were the surgeons who first met and examined the patient and did the, surgery and treatment while Ewole Ella AC and Eya Stephane, were responsible for writing the first draft of the manuscript. Bengono Bengono R.S supervised the writing of the paper and completed the final editing. All the authors read and approved the final manuscript.

References

1. Holt AC, Bamarni S, Leslie SW. Umbilical Hernia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cité 29 sept 2025]. Disponible sur: <http://www.ncbi.nlm.nih.gov/books/NBK459312/>
2. Paul EJ, Basile E, Benjamin GM, Marcelin NN. Hernie Ombilicale de l'Adulte : Aspects Cliniques, Thérapeutiques et Évolutifs dans Trois Hôpitaux de la Ville de Douala: Adult umbilical hernia: clinical presentation, surgical treatment and outcome in three hospitals of the city of Douala. Health

- Sci Dis. 2021;22(8):67-68. Disponible sur: <https://www.hsd-fmsb.org/index.php/hsd/article/view/2911>
3. Engbang JP, Essola B, Fouda B, Baakaiwe LD, Chichom AM, Ngowe MN. Inguinal Hernias in Adults: Epidemiological, Clinical and Therapeutic Aspects in the City of Douala. *J.S.Research*. 2021;4(1):95-118.
 4. Yao LB, Akobe AJR, M'Bra KI, Sery BJLN, Kouassi KJE, Kouassi AAN, et al. Les raisons du refus et abandon de soins aux urgences chirurgicales du Centre Hospitalier et Universitaire de Bouaké, Côte d'Ivoire. *Pan Afr Med J*. 2021;38:291.
 5. La médecine traditionnelle: attitude et comportement des patients marocain – Centre Hospitalier Universitaire Hassan II [Internet]. [cité 16 oct 2025]. Disponible sur: <http://www.chu-fes.ma/la-medecine-traditionnelle-attitude-et-comportement-des-patients-marocain/>
 6. Degu S, Kejela S, Zeleke HT. Perioperative mortality of emergency and elective surgical patients in a low-income country: a single institution experience. *Perioper med(Lon)* 2023;12(1):49.
 7. Dongmo AM, Atemkeng Tsatedem F, Amougou B, Banga Nkomo DD, Fondop J, Guifo FL, et al. A case of massive retroperitoneal hematoma secondary to hernia repair and review of the literature. *World J Bio Pharm He Sci*. 2024;17(2):184-8.
 8. Nilsson H, Stylianidis G, Haapamäki M, Nilsson E, Nordin P. Mortality After Groin Hernia Surgery. *Ann Surg*. avr 2007;245(4):656-60.



Difficultés dans le diagnostic étiologique de la glomérulonéphrite aiguë post streptococcique chez l'enfant : à propos de 2 cas au service de pédiatrie du CHU Libreville

Challenges in Establishing the Etiological Diagnosis of Acute Post-Streptococcal Glomerulonephritis in Children: A Report of Two Cases from the Pediatric Department of Libreville University Hospital

Loembe FC¹, Yama Nzoma SD¹, Bingoulou Matsougou G¹, Afoughe Mayombo O¹, Awassi E¹, Oyane Minko M¹, Okissi B¹, Minto'o S¹

Cas Clinique

1. Service de Pédiatrie
- Centre Hospitalier
Universitaire de Libreville

Auteur correspondant : Steeve Minto'o, Service de Pédiatrie, CHU Libreville, steeve.mintoo@yahoo.fr, Tél : +24166265477

Mots-clés : Glomérulonéphrite aiguë post-streptococcique, Enfant, Diagnostic étiologique, Ressources limitées

Key words: Acute post-streptococcal glomerulonephritis, Children, Etiological diagnosis, Resource-limited settings

Date de soumission: 03/11/2025

Date d'acceptation: 09/12/2025

RESUME

La glomérulonéphrite aiguë post-infectieuse, particulièrement post-streptococcique, est la néphropathie la plus fréquente chez l'enfant, avec une incidence élevée dans les pays à faibles revenus, où l'accès aux examens paracliniques est limité. Nous avons rapporté deux cas pédiatriques présentant un tableau clinique typique : œdèmes, hématurie et hypertension mais dont la confirmation diagnostique était rendue difficile par l'absence d'examens tels que le dosage du complément C3 ou la recherche du streptocoque. Les deux patientes présentaient une insuffisance rénale aiguë et des ASLO élevés. Malgré ces contraintes, ce diagnostic a été retenu et une antibiothérapie par pénicilline a été instaurée, permettant une évolution favorable en quelques jours. Dans ce contexte limité, la glomérulonéphrite post-streptococcique doit être diagnostiquée prioritairement sur des données cliniques, notamment la mesure de la pression artérielle et la bandelette urinaire, afin d'éviter des retards diagnostiques et d'améliorer la prise en charge.

ABSTRACT

Acute post-infectious glomerulonephritis particularly in its post-streptococcal form remains the most common nephropathy in children, with a notably high incidence in low-income countries where access to complementary investigations is limited. We describe two pediatric cases displaying the classic constellation of edema, hematuria, and hypertension, yet whose diagnostic confirmation proved challenging owing to the unavailability of tests such as complement C3 measurement or streptococcal detection. Both patients presented with acute renal failure and elevated ASO titers. Despite these constraints, the diagnosis was ultimately established, and penicillin therapy was initiated, leading to favorable clinical improvement within a few days. In such resource-limited settings, post-streptococcal glomerulonephritis must be approached primarily as a clinical diagnosis guided by blood pressure assessment and urine dipstick testing in order to prevent diagnostic delays and enhance patient care.

DOI : <https://doi.org/10.64294/jsd.v3i4.202>

Introduction

La glomérulonéphrite aigue se définit comme une atteinte inflammatoire aigue non suppurative du glomérule le plus souvent d'origine post-infectieuse et déclenchée par des infections bactériennes, virales ou fongiques [1]. Il s'agit de la néphropathie la plus fréquente en population pédiatrique, avec une incidence globale estimée à 472.000 cas, avec 77% des cas provenant de pays à faibles revenus [2], où les ressources limitées rendent difficile la réalisation d'examens paracliniques nécessaires au diagnostic. Le tableau clinique classique quant à lui, associe des symptômes typiques tels que des œdèmes, une hématurie et une hypertension artérielle (HTA). Cependant, les patients atteints de glomérulonéphrite aigüe post-infectieuse présentent parfois des symptômes cliniques inhabituels ou atypiques, qui entraînent souvent un diagnostic tardif ou erroné de la maladie, responsables d'une morbidité accrue [3]. Nous rapportons deux cas ayant présenté des manifestations cliniques typiques mais dont le diagnostic de certitude était difficile en raison de ressources limitées.

Observation

Cas 1 : T.W., nourrisson de 22 mois de sexe féminin, pesant 12 kilos (kg), et avec une taille de 86 centimètres (cm) sans antécédent médico-chirurgical ayant une couverture vaccinale correcte pour le programme élargi de vaccination (PEV) du Gabon, au phénotype de l'hémoglobine inconnu, hospitalisé pour œdèmes généralisés évoluant en contexte fébrile chez qui on retrouvait à l'anamnèse une infection rhinopharyngée survenue moins de deux semaines avant les œdèmes, mais mal traitée. L'examen clinique retrouvait une anasarque, un bon état nutritionnel, une hématurie macroscopique et une hypertension artérielle (HTA) grade III à 166/113 mm Hg. La bandelette urinaire (BU) retrouvait : une croix (+) de leucocytes, + de nitrites, ++ de protéines, +++ d'hématies. Le bilan paraclinique montrait une insuffisance rénale aigüe (IRA) avec une créatinine à 227,20 $\mu\text{mol/L}$, soit un débit de filtration glomérulaire (DFG) à 15 ml/min, une urée à 21,26 mmol/L, une albuminémie à 33,66 g/L, une protidémie à 61 g/L, une anémie à 8,7 g/dL, HCT à 27,7 %, des leucocytes à 10.930/mm³ et des anticorps antistreptolysine O (ASLO) à 400 UI/L. Le rapport protéines/créatinine urinaire (P/C), la protéinurie des 24h, les fractions C3 et CH50 du complément et l'écouvillonnage oropharyngé n'ont pas été réalisés, non disponibles dans les laboratoires des hôpitaux publics, non accessibles à la famille dans les laboratoires privés.

Cas 2 : E.R., adolescente de 12 ans de sexe féminin, pesant 29 kg pour une taille de 144 cm sans antécédent médico-chirurgical particulier, à la couverture vaccinale incorrecte pour le PEV du Gabon au phénotype de l'hémoglobine inconnu qui

était hospitalisée pour des œdèmes du visage chez qui l'anamnèse révélait une fièvre et un syndrome grippal non traités évoluant depuis trois semaines. L'examen clinique retrouvait un syndrome d'altération de l'état général, une HTA grade II à 137/89 mm Hg et des adénopathies cervicales et axillaires infracentimétriques. La BU mettait en évidence ++ leucocytes, ++ protéines et +++ hématies. Le bilan biologique montrait une IRA avec une créatininémie à 196 $\mu\text{mol/L}$ soit un DFG de 36 ml/min, une urémie à 24,63 mmol/L, une hypoalbuminémie à 22,19 g/L, une protidémie à 72 g/L, une anémie à 9,7 g/dL, une hyperleucocytose à 16.220/mm³, avec une neutrophilie à 12.490/mm³, des ASLO à 800UI/L. Le rapport P/C, la protéinurie des 24 h, les fractions C3 et CH50 du complément et l'écouvillonnage oropharyngé à la recherche du streptocoque n'ont pas été réalisés.

Dans les deux cas le diagnostic de glomérulonéphrite post infectieuse (post streptococcique) a été retenu et une prise en charge visant à stériliser le foyer infectieux, assurer le confort du malade, prévenir et traiter les complications ainsi que prévenir les récives a été mis en œuvre. Une antibiothérapie ciblant le streptocoque à savoir une bêta lactamine du groupe des pénicillines a été instaurée à savoir de l'oracilline à 100.000 UI/kg/jr pour le cas 1 et de l'amoxicilline associée à de l'acide clavulanique à 100mg/kg/jour pour le cas 2. Aucune restriction hydrosodée, aucun diurétique et aucune corticothérapie n'a été prescrite. L'évolution dans les deux cas était favorable sous traitement avec régression des signes cliniques (œdèmes, hématurie, HTA) et paracliniques (urée, créatinine), en 5 jours.

Discussion

L'incidence de la glomérulonéphrite post streptococcique (GNPS) chez les enfants dans les pays en voie de développement est très élevée, estimée à 24,3/100.000 par an, comparée à 6,2/100.000 par an dans les pays industrialisés [4]. Cette différence s'explique par l'amélioration de l'hygiène et des conditions socio-économiques, la prise en charge précoce des infections streptococciques (angines, impétigos), ainsi que la diminution des souches streptococciques néphritogènes dans les pays développés [5,6]. Cette incidence nettement plus faible dans les régions développées n'est pas uniquement due à l'amélioration des conditions médicales, mais plus probablement à une sous-estimation de l'incidence réelle, car dans ces pays, la plupart des cas ne sont pas orientés vers des soins spécialisés ou restent infracliniques en l'absence de consultation médicale. Des études menées auprès des frères et sœurs et des proches de patients atteints GNPS ont révélé que le taux de maladie infraclinique est 3 à 4 fois supérieur à celui des cas symptomatiques [7]. Un

de nos patients était seulement âgé de 22 mois, cas inhabituel pour la GNPS, qui touche principalement les enfants âgés de 3 à 12 ans et est rare chez les enfants de moins de 3 ans [8,9].

La plupart des cas surviennent à la suite d'une pharyngite à streptocoques plutôt que d'une infection cutanée[10], comme ce fut le cas chez nos patients. Sur le plan clinique, nos deux patients présentaient des signes typiques de glomérulonéphrite, décrits dans la littérature [7,11,12]. Cependant Kee Huyk et al. [3] en Corée du Sud, ainsi que Bah et al. en Guinée observaient des signes atypiques à type de céphalées, convulsions, dyspnées, douleurs thoraciques qui s'inscrivaient dans le cadre des complications de la pathologie, à savoir encéphalopathie hypertensive et œdème pulmonaire [3,13].

Dans les deux cas présentés, la limite des ressources ne nous a pas permis de poser le diagnostic à l'aide de la réalisation de la fraction C3 du complément comme dans l'étude de Bayen et al. en Tunisie et Kee et al. en Corée du Sud chez qui tous les patients présentaient une baisse de la fraction C3 du complément [3,12]. Bien que les ASLO que nous avons dosés étaient supérieurs à la normale, leur utilisation en pratique clinique courante présente des limites. Ils ne sont pas vérifiés régulièrement mais uniquement lors de la présentation des symptômes. Ce moment peut être précoce dans l'évolution de la pathologie, potentiellement avant l'augmentation des ASLO, et peut donc conduire à un résultat faussement négatif. Il a également été rapporté que les ASLO peuvent être atténués chez les patients traités par des antibiotiques antistreptococciques, ce qui rend ces tests moins sensibles. De plus, les ASLO n'augmentent pas dans les infections cutanées à streptocoque A, car la streptolysine peut être liée aux lipides cutanés. L'écouvillonnage oropharyngé, permettant quant à lui d'isoler le streptocoque du groupe A dans la sphère ORL, n'a pas été réalisé dans notre contexte ; il était très peu contributif dans l'étude de Bah et al. en Guinée. En effet, les prélèvements pharyngés peuvent être négatifs au moment de la GNA car l'infection streptococcique précède parfois la néphrite de 1 à 3 semaines dans la pharyngite, par ailleurs l'isolement du germe est beaucoup plus fréquent en cas d'atteinte cutanée [14,15]. Le traitement restait similaire dans toute la littérature avec l'utilisation de mesures hygiéno-diététique, des diurétique et d'antibiothérapie en cas de foyer patent et nous a donc permis de confirmer ce diagnostic avec la régression des signes cliniques.

Conclusion

La glomérulonéphrite aiguë post-streptococcique demeure une affection fréquente dans notre pays en développement. Si son diagnostic clinique et anamnestique est généralement accessible, la confirmation paraclinique se heurte à un manque

récurrent de ressources, notamment l'indisponibilité du dosage du C3. Cette contrainte conduit souvent à s'appuyer principalement sur les ASLO, dont les faux négatifs peuvent retarder le diagnostic. Dans ce contexte marqué par des moyens limités et un statut socio-économique fréquemment précaire, le diagnostic doit donc rester avant tout clinique. La mesure rigoureuse des chiffres tensionnels et leur interprétation, associées à l'utilisation systématique de la bandelette urinaire, constituent les piliers essentiels de l'évaluation. Il apparaît dès lors indispensable que chaque clinicien demeure particulièrement attentif à ces outils simples mais déterminants, afin d'éviter les retards diagnostiques et d'améliorer la prise en charge dans nos environnements contraints.

Conflit d'intérêt : Les auteurs certifient qu'ils n'ont reçu aucun financement, avantage matériel ou soutien pouvant influencer ou être perçu comme influençant le contenu de cet article. Aucun conflit d'intérêts, financier ou non financier, n'est déclaré.

Contribution des auteurs : Loembe FC et Yama Nzoma SD ont rédigé la première version de l'article, et ce dernier a traduit les résumés, Bingoulou Matsougou G, Afoughe Mayombo O, Awassi E, Oyane Minko M et Okissi B ont contribué à la rédaction de l'article. Minto'o S. a conçu, lu et corrigé l'article. Tous les auteurs ont approuvé la version finale et assument la responsabilité du contenu.

Références

1. Ramdani B, Zamd M, Hachim K, Soulamy K, Ezzahidy M, Souiri M, et al. Glomérulonéphrites aiguës post infectieuses. *Néphrologie Thérapeutique*. 2012 ;8(4) :247–58
2. Steer AC, Danchin MH, Carapetis JR. Group A streptococcal infections in children. *J Pediatric Child Health*. 2007; 43(4) :203–13.
3. Kee H. K. Clinical Manifestation Patterns and Trends in Poststreptococcal Glomerulonephritis. *Chil Kidney Dis*. 2016; 20:6-10
4. Brant Pinheiro SV, de Freitas VB, de Castro GV, Rufino Madeiro BC, de Araújo SA, Silva Ribeiro TF, et al. Acute Post-Streptococcal Glomerulonephritis in Children: A Comprehensive Review. *Curr Med Chem*. 2022; 29(34):5543–59.
5. Usui J, Tawara-lida T, Takada K, Ebihara I, Ueda A, Iwabuchi S, et al. Temporal Changes in Post-Infectious Glomerulonephritis in Japan (1976-2009). *PLoS ONE* 2016;11(6): 573-56
6. Rawla P, Padala SA, Ludhwani D. Poststreptococcal Glomerulonephritis. *StatPearls, Treasure Island (FL): StatPearls Publishing; 2025*.
7. VanDeVoorde RG. Acute poststreptococcal glomerulonephritis: the most common acute glomerulonephritis. *Pediatr Rev* 2015; 36(1):3–12.
8. Dagan R, Cleper R, Davidovits M, Sinai-Trieman L, Krause I. Post-Infectious Glomerulonephritis in Pediatric Patients over Two Decades: Severity-Associated Features. *Isr Med Assoc J IMAJ*. 2016;18(6) :336–40.
9. Kari JA, Bamagai A, Jalalah SM. Severe acute post-streptococcal glomerulonephritis in an infant. *Saudi J Kidney Dis Transplant Off Publ Saudi Cent Organ Transplant Saudi Arab*. 2013;24(3):546–8.

10. Eison TM, Ault BH, Jones DP, Chesney RW, Wyatt RJ. Post-streptococcal acute glomerulonephritis in children: clinical features and pathogenesis. *Pediatr Nephrol Berl Ger.* 2011;26(2):165–80.
11. Ong LT. Management and outcomes of acute post-streptococcal glomerulonephritis in children. *World J Nephrol* 2022 ;11(5) :139–45.
12. Bayen M, Mona BA. La glomérulonéphrite aiguë post-streptococcique de l'enfant dans le sud tunisien : étude rétrospective de 12 ans. *Nephrol Ther.* 2018 ; 12(1) :1065
13. Bah AO, Diallo SB, Kaba Ml. Les glomérulonéphrites aiguës post-infectieuses de l'enfant : Aspects épidémiologiques et cliniques dans le Service de pédiatrie du CHU Donka, Conakry. *Rev Int Sci Médicales.* 2006 ;8(3) :31–4.
14. Frenck RW, Laudat F, Liang J, Giordano-Schmidt D, Jansen KU, Gruber W, et al. A Longitudinal Study of Group A Streptococcal Colonization and Pharyngitis in US Children. *Pediatr Infect Dis J.* 2023; 42(12):1045–50.
15. Zoch-Zwierz W, Wasilewska A, Biernacka A, Tomaszewska B, Winiecka W, Wierciński R, et al. The course of post-streptococcal glomerulonephritis depending on methods of treatment for the preceding respiratory tract infection. *Wiadomosci Lek Wars Pol.* 2001;54(1-2):56–63.