



Epidemiological and clinical profile of patients admitted for neurological emergencies at the Douala General Hospital, Cameroon

Profil Épidémiologique et Clinique des Patients Admis pour Urgences Neurologiques à l'Hôpital Général de Douala, Cameroun

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Original Article

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ABSTRACT

Introduction: Neurological emergencies are a major global health challenge, with a significant burden in low- and middle-income countries. This study aimed to determine the epidemiological and clinical profile of patients presenting with these acute conditions at the Douala General Hospital, Cameroon.

Methods: A descriptive, prospective cross-sectional study was conducted over five months at the Douala General Hospital Emergency Department. Data from all 44 patients admitted for a neurological emergency were collected and analyzed using descriptive statistics.

Results: Neurological emergencies represented 3.32% (44/1324) of emergency admissions, primarily affecting males (sex ratio 2.4:1) with a mean age of 54.97 years. The most common presentation was altered consciousness (75%). A concerning mean delay to consultation of 30.42 hours was noted, with 68.2% of transport being non-medical. Hypertension (34.1%) was the key comorbidity. On admission, 40.9% were in a deep coma (GCS ≤8). The main etiologies were Traumatic Brain Injury (TBI) (43.2%), followed by stroke (18.2%) and metabolic encephalopathy (18.2%). The overall mortality rate was high at 27.3%. Cardio-respiratory arrest was a significant predictor of mortality ($p < 0.001$).

Conclusion: TBI is the leading cause of neurological emergencies at this urban Cameroonian hospital, followed by stroke and metabolic disorders. The high mortality underscores the critical need for better pre-hospital care, robust public health initiatives against vascular risk factors, and enhanced institutional capacities for advanced diagnosis and therapy.

RESUME

Introduction : Les urgences neurologiques constituent un défi majeur de santé publique. Cette étude visait à déterminer le profil épidémiologique et clinique des patients se présentant avec ces affections aiguës à l'Hôpital Général de Douala, Cameroun.

Méthodes : Une étude transversale descriptive et prospective a été menée sur cinq mois au service des urgences de l'Hôpital Général de Douala. Les données des 44 patients admis pour une urgence neurologique ont été collectées et analysées par des statistiques descriptives.

Résultats : Les urgences neurologiques représentaient 3,32 % (44/1324) des admissions, affectant principalement les hommes (sexe-ratio 2,4) avec un âge moyen de 54,97 ans. Le motif d'admission le plus fréquent était l'altération de la conscience (75 %). Un délai moyen de consultation préoccupant de 30,42 heures a été noté, avec 68,2 % de transports non médicalisés. L'hypertension (34,1 %) était la principale comorbidité. À l'admission, 40,9 % des patients étaient dans un coma profond (GCS ≤8). Les principales étiologies étaient le traumatisme crânien (TC) (43,2 %), suivi des accidents vasculaires cérébraux (AVC) (18,2 %) et de l'encéphalopathie métabolique (18,2 %). Le taux de mortalité global était élevé (27,3 %). L'arrêt cardio-respiratoire était un prédicteur significatif de mortalité ($p < 0,001$).

Conclusion : Le TC est la première cause d'urgences neurologiques dans cet hôpital urbain camerounais. La mortalité élevée souligne le besoin critique d'améliorer les soins pré-hospitaliers et d'accroître les capacités institutionnelles pour le diagnostic et le traitement avancés.

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Introduction

Developing countries, particularly those in sub-Saharan Africa, are undergoing a rapid epidemiological transition [1]. Changing lifestyles are contributing to a rising prevalence of cardiovascular risk factors, which in turn increases the incidence of acute neurological events [1, 2]. Neurological emergencies are defined as conditions of the nervous system that, without rapid and adequate medical intervention, can lead to significant morbidity or mortality [3, 4]. Globally, it is estimated that 10–20% of all emergency department consultations are for neurological complaints, with traumatic brain injury (TBI) being a leading cause of death and disability in young adults [5, 6]. In low- and middle-income countries (LMICs), the burden of neurological emergencies is believed to be increasing, compounded by challenges such as delayed presentation, lack of pre-hospital emergency medical services, and limited access to essential diagnostic tools like computed tomography (CT) [7, 8]. Neurological emergencies can be broadly classified into three critical presentations: altered states of consciousness or coma, seizures, and acute paralysis [9]. Despite their frequency and severity, there is a scarcity of comprehensive data on the profile of neurological emergencies in sub-Saharan Africa, and in Cameroon specifically. Existing studies are often fragmented or focus on a single pathology [10, 11]. Therefore, this study was designed to determine the epidemiological and clinical characteristics of patients presenting with neurological emergencies in the medical-surgical emergency department of the Douala General Hospital, a major tertiary care center in Cameroon.

Patients and Methods

This was a prospective, descriptive cross-sectional study conducted in the emergency department of the Douala General Hospital over a 5-month period. The study population included all patients of any age admitted to the emergency department during the study period who presented with an acute neurological condition, defined as a new-onset disturbance of consciousness (Glasgow Coma Score < 15), seizure activity, or focal neurological deficit (e.g., hemiparesis, aphasia). Inclusion criteria were the presence of a neurological emergency and the provision of informed consent from the patient or a legal guardian. Patients who arrived deceased or for whom consent could not be obtained were excluded. For each enrolled patient, we collected data on demographics (age, sex), clinical history of comorbidities, mode and time of arrival, presenting symptoms, physical examination findings (including Glasgow Coma Scale [GCS] score, pupillary examination), diagnostic investigations (neuroimaging, laboratory tests), treatment provided, and patient outcomes (morbidity, mortality, length of stay). Data were collected prospectively by the

physicians and residents working in the Emergency Department using a standardized form. The collection process was supervised by the principal investigator to maintain data quality. Data were entered and analyzed using SPSS Statistics for Windows, Version 26.0 (Armonk, NY: IBM Corp). Descriptive statistics were used to calculate frequencies, percentages, means, and standard deviations. The chi-square test was used to assess associations, with a p-value of <0.05 considered statistically significant.

Results

Over the 5-month study period, 44 of the 1,324 patients admitted to the emergency department met the inclusion criteria, yielding a hospital prevalence of neurological emergencies of 3.32%. The demographic, clinical, and etiological characteristics are detailed below. Mean pre-hospital delay (hours) 30.42 ± 25.1 . Based on the study data, the hospital prevalence was recorded at 44 cases, representing 3.32% of the population. The patient population had a mean age of 54.97 years (± 20.40 SD), with ages spanning a wide range from 1 to 87 years. Notably, the age group over 60 years accounted for 47.2% of the cases. Regarding the gender distribution, there was a clear male predominance with 31 males, making up 70.5% of the total. This resulted in a sex ratio of 2.4:1 in favor of males.

Table 1: Pre-hospital and Clinical Presentation

Parameters	Values (n)	Percentages (%)
Mean Pre-hospital Delay (hours \pm SD)	30.42 ± 25.1	-
Transport Mode: Non-medical, n (%)	30	68.2
Presenting Complaint	-	-
Altered Consciousness	33	75.0
Limb Weakness	5	11.4
Seizures	2	4.5
Key Comorbidities	-	-
Hypertension	15	34.1
Diabetes Mellitus	8	18.2
History of Stroke	6	13.6

Traumatic brain Injury the single most frequent etiology in this study, accounting for 43.2% of all cases (n=19). The high prevalence of trauma often points toward a specific demographic (often younger males) or a high incidence of road traffic accidents in the study's geographic area. It represents nearly half of the workload for the emergency neurological team. While TBI is the largest single category, non-traumatic etiologies collectively represent the majority of patients (n=25). The distribution within this group is significant. With 8 cases, ischemic strokes (n=5) are more frequent than hemorrhagic strokes (n=3). Metabolic Encephalopathy (Hypoglycemia): Interestingly, hypoglycemia is just as common as strokes (8

cases). This highlights the critical need for systematic blood glucose testing in any patient presenting with altered consciousness. CNS Infections: Conditions such as meningitis account for 9.1% of cases. While less frequent, these require immediate diagnostic intervention (lumbar puncture) and time-sensitive treatment. Toxic Encephalopathy: This remains a rare cause in this specific series, representing only 2.3% of admissions. Diagnostic Priority: Since 18.2% of cases are due to hypoglycemia—a condition that is immediately reversible with glucose administration—this data reinforces the "D" (Disability/Dextrose) step in emergency protocols to avoid unnecessary and expensive neuroimaging. Resource Allocation: The combination of TBI and Stroke (over 60% of cases) suggests a high demand for CT/MRI availability and specialized intensive care unit (ICU) beds for neuromonitoring.

Table 2: Etiological Distribution of Neurological Emergencies

Etiology Category	Specific Diagnosis	Frequency (n)	Percentage (%)
Traumatic (n=19)	Traumatic Brain Injury (TBI)	19	43.2
Non-Traumatic (n=25)	Stroke (5 Ischemic, 3 Hemorrhagic)	8	18.2
	Metabolic Encephalopathy (Hypoglycemia)	8	18.2
	CNS Infections (e.g., Meningitis)	4	9.1
	Toxic Encephalopathy (Suspected)	1	2.3

Patients arrived with a Glasgow Coma Scale (GCS) ≤ 8. This indicates a high requirement for immediate airway protection (intubation) and mechanical ventilation. Pupillary Abnormalities: Found in 22.7% of cases. This is a red-flag clinical sign often associated with brain herniation or severe brainstem compression, correlating with the high percentage of deep comas. Diagnostic Efficiency: A high percentage of patients (86.4%) underwent neuroimaging. This suggests good access to CT or MRI, which is essential for differentiating between the etiologies identified in your previous table (TBI vs. Stroke vs. Infection). Surgical Necessity: Only 9.0% (n=4) required neurosurgical intervention (craniotomy). This indicates that the majority of these emergencies were managed medically (osmotherapy, metabolic correction, or supportive care) rather than through surgical decompression. The prognosis for this cohort is severe, reflecting the critical nature of neurological emergencies. The overall mortality is 27.3% (n=12). This is a significant figure, likely driven by the 40.9% of patients in deep coma. Cardio-respiratory Arrest (CRA): 15.9% of patients experienced CRA. Duration of Care: The mean hospital stay was quite

short (26.37 hours). In the context of a 27% mortality rate, this suggests that deaths occurred rapidly after admission, or that patients were quickly stabilized and transferred. The most significant finding in this table is the strong association between Cardio-respiratory Arrest and Mortality (p<0.001).

Table 3: Clinical Severity, Management Highlights, and Outcomes

Parameters	Value(n)	Percentages (%)
Clinical Severity at Admission	-	-
Deep Coma (GCS ≤ 8)	18	40.9
Pupillary Abnormalities	10	22.7
Management Highlights	-	-
Neuroimaging Performed	38	86.4
Surgical Intervention (Craniotomy)	4	9.0
Outcomes	-	-
Overall Mortality Rate,	12	27.3
Mean Hospital Stay (hours ± SD)	26.37 ± 20.5	-
Cardio-respiratory Arrest,	7	15.9
Mortality in patients with Cardio-respiratory Arrest		p < 0.001

Discussion

This study provides a crucial snapshot of the burden of neurological emergencies in a major urban center in Cameroon. The observed hospital prevalence of 3.32% is lower than the 10-20% reported in high-income countries [5, 12] but is comparable to the 1.63% for non-traumatic emergencies found by Sissoko et al. in Mali [11]. This discrepancy likely reflects a combination of factors prevalent in LMICs, including differences in healthcare-seeking behavior, self-medication, referral patterns that bypass tertiary centers for less severe cases, and a higher threshold for what constitutes a neurological emergency in our resource-constrained setting [13, 26].

The demographic profile, with a strong male predominance (sex ratio 2.4:1) and a mean age in the sixth decade, is consistent with findings from other African studies [10, 14]. The overrepresentation of males is closely linked to the leading etiology in our cohort: traumatic brain injury (43.2%), which disproportionately affects young and middle-aged men due to higher engagement in high-risk activities and road traffic incidents [15, 16, 22]. Concurrently, the significant proportion of elderly patients (47.2% >60 years) highlights the growing burden of non-communicable diseases (NCDs), with hypertension and diabetes being the most common comorbidities, predisposing this group to stroke [1, 17].

A critical and alarming finding is the significant pre-hospital delay, with a mean time to consultation exceeding 30 hours, and the overwhelming reliance on non-medical transport (68.2%). This is a pervasive

challenge across sub-Saharan Africa, where formal emergency medical services (EMS) are either nascent or non-existent [18, 19]. Such delays are catastrophic for outcomes in time-sensitive conditions like acute stroke, where “time is brain,” and severe TBI, where delays in managing intracranial pressure are fatal [20, 21]. This “first delay” in seeking and reaching care is a primary driver of the high morbidity and mortality observed.

The etiological spectrum reveals a dual burden of disease. TBI was the single most common diagnosis, reflecting the “epidemic” of trauma in rapidly urbanizing African cities [22]. Stroke and metabolic disturbances (primarily hypoglycemia) were the next most frequent causes, underscoring the concurrent challenge of managing NCDs [23, 27]. The high proportion of patients presenting in a deep coma (GCS ≤ 8 in 40.9%) is a stark indicator of both the severity of the underlying pathologies and the advanced stage at which patients reach definitive care, likely a direct consequence of the pre-hospital delays.

The overall mortality rate of 27.3% is tragically high but, unfortunately, aligns with rates reported for critically ill patients in other resource-limited settings [24, 28]. It is substantially higher than the 9% reported by Bikono et al. in a study focused on operated TBI in Yaoundé [10], a difference likely explained by our inclusion of a broader, more heterogeneous group of neurological emergencies, including severe metabolic and vascular insults that may not be amenable to surgery. The significant association of cardio-respiratory arrest with mortality ($p < 0.001$) confirms it as a final common pathway for irreversible brain injury and systemic collapse in this cohort [25, 29].

Limitations

The main limitation of this study lies in its single-center design and short duration (5 months), which may restrict the generalizability of the findings. The prospective nature is a strength, but the low rate of access to advanced imaging (such as MRI) and the significant pre-hospital delays may have introduced a selection bias or influenced the accuracy of the definitive etiological diagnoses.

Conclusion

Neurological emergencies constitute a significant and challenging portion of admissions at the Douala General Hospital. Traumatic brain injury, stroke, and metabolic encephalopathies are the most common causes. The associated morbidity and mortality are high, exacerbated by long pre-hospital delays and a lack of formalized emergency transport systems. Strengthening the chain of survival through public awareness campaigns, development of EMS, and improving in-hospital diagnostic and therapeutic

protocols are crucial steps to improve outcomes for these critically ill patients in Cameroon.

Conflict of Interest: The authors declare that they have no financial or personal conflict of interest related to the research, publication, or results of this study.

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References

1. Feigin VL, et al. Global, regional, and national burden of stroke and its risk factors, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Neurol.* 2021;20(10):795-820.
2. GBD 2016 Neurology Collaborators. Global, regional, and national burden of neurological disorders, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol.* 2019;18(5):459-480.
3. Hocker S. The initial approach to the patient with a suspected neurological emergency. *Continuum (Minneapolis)*. 2017;23(4):903-924.
4. Kolawole, OO, et al. Pattern and outcome of neurological emergencies in a Nigerian tertiary hospital. *Annals of African Medicine.* 2016;15(4):159-163.
5. Huff JS, et al. Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with acute headache. *Ann Emerg Med.* 2008;52(4):407-36.
6. Maas AIR, et al. Traumatic brain injury: integrated approaches to improve prevention, clinical care, and research. *Lancet Neurol.* 2017;16(12):987-1048.
7. Haglund MM, et al. The need for a global initiative on neurological emergencies. *eNeurologicalSci.* 2016;4:29-30.
8. Gerard A, et al. Challenges in management of neurological emergencies in low- and middle-income countries. *Front Neurol.* 2018;9:945.
9. Aya AG, Ondze B, Ripart J, de La Coussaye JE. Urgences neurologiques et grosse. *Congrès National d'Anesthésie - Réanimation.* 2009.
10. Renée BAE, et al. Profil des Traumatismes Crâniens Opérés au Centre des Urgences de Yaoundé. *Health Sci Dis.* 2025;26(1).
11. Sissoko AS, et al. Aspects Cliniques des Urgences Neurologiques Non Traumatiques au Mali. *Health Sci Dis.* 2024;25(8).
12. Edlow JA, Selim MH. Atypical presentations of acute cerebrovascular syndromes. *Lancet Neurol.*

- 2011;10(6):550-61.
13. Kengne AP, et al. The profile of patients with neurological disorders in a rural district hospital in Cameroon. *J Epidemiol Glob Health*. 2013;3(4):235-41.
 14. Blake BAW, et al. Evaluation de l'interprétation des scanners cranio-encéphaliques en urgence neurologique adulte à Abidjan. *J Afr Imag Médicale*. 2024;16(4):192-6.
 15. Adeloye D, et al. The burden of road traffic crashes, injuries and deaths in Africa: a systematic review and meta-analysis. *Bull World Health Organ*. 2016;94(7):510-521A.
 16. Johnson WD, et al. Epidemiology of traumatic brain injury in a predominantly rural population in Ghana. *J Neurosurg Pediatr*. 2015;16(4):450-7.
 17. Owolabi MO, et al. The burden of stroke in Africa: a glance at the present and a glimpse of the future. *Cardiovasc J Afr*. 2015;26(2 Suppl 1):S27-38.
 18. Jayaraman S, et al. The organization of prehospital care in low- and middle-income countries. *Prehosp Emerg Care*. 2018;22(3):391-399.
 19. Mock C, et al. Strengthening the emergency response to trauma in low- and middle-income countries. *Injury*. 2017;48(8):1581-1587.
 20. Saver JL. Time is brain--quantified. *Stroke*. 2006;37(1):263-6.
 21. Hukkelhoven CW, et al. The impact of prehospital delay on outcome after severe traumatic brain injury. *J Trauma*. 2004;56(3):484-91.
 22. World Health Organization. Global status report on road safety 2018. Geneva: World Health Organization; 2018.
 23. Mapoure YN, et al. The clinical profile of stroke patients in a tertiary hospital in Douala, Cameroon. *Pan Afr Med J*. 2014;18:119.
 24. Kassebaum NJ, et al. Global, regional, and national levels of maternal mortality, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388(10053):1775-1812.
 25. Balogou AAK, et al. Accidents vasculaires cérébraux chez le sujet jeune (15 à 45 ans) dans le service de neurologie du CHU Campus de Lomé. *Afr J Neurol Sci*. 2008;27(2).
 26. Maredza M, et al. Healthcare seeking behaviour of patients with neurological disorders in a rural South African setting. *Afr J Prim Health Care Fam Med*. 2015;7(1):820.
 27. Atadzhanov M, et al. The burden of neurological disorders in a resource-limited setting in Zambia. *J Neurol Sci*. 2015;349(1-2):135-9.
 28. Murthy S, et al. The outcome of the critically ill in low- and middle-income countries: a systematic review and meta-analysis. *Crit Care Med*. 2015;43(11):2362-70.
 29. Wong GKC, et al. Predictors of mortality in severe traumatic brain injury in the first week of intensive care. *J Clin Neurosci*. 2010;17(5):582-5.
 30. Baelani I, et al. The effectiveness of a simplified emergency and critical care training program for generalist doctors and nurses in a sub-Saharan African hospital. *PLoS One*. 2012;7(1):e28980.