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Knowledge, preventive measures and coping strategy by the patients in relation to *Helicobacter pylori* infection at the Buea Regional Hospital

Connaissances, mesures préventives et stratégies d'adaptation des patients en rapport avec les infections à Helicobacter pylori à l'Hôpital Régional de Buea

Makemgue LS[1*], Ewo Bokeng Ndeah VB[2], Mojoko Eko S[2], Vauloup Fellous C[3], Foumane P[1]

Article original

[1] Faculty of Medicine and Pharmaceutical Sciences, University of Ebolowa, Sangmelima
[2] Department of Biomedical Sciences, Faculty of Health Sciences, University of Buea, Cameroon.
[3] Division of Virology, WHO Rubella National Reference Laboratory, Paris Saclay University Hospital, APHP, Paris France.

***Corresponding author:**
Louise Stéphanie Makemgue**.** *Faculty of Medicine and Pharmaceutical Sciences, University of Ebolowa, Sangmelima, Po Box 599***,** Email: stephaniemakemgue@gmail.com ,Tel: 00237 679649388

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ABSTRACT2

Background: Peptic ulcers are sores found in the lining of the stomach, the upper portion of the small intestines or the lining of the oesophagus that can cause moderate to severe burning pain. Some risk factors of peptic ulcers include: *Helicobacter pylori* infection (HPI), regular intake of analgesics, Zollinger-Ellison-Syndrome, acidic over-production, stress and many associated risk factors. This study was carried out in the South West Region of Cameroon, in the Buea Regional Hospital. The aim of this study was to assess the prevalence of peptic ulcer, patient's knowledge of the disease, its risk factors, measures set in place by the participants to prevent themselves and ways patients manage the disease.
Methods: This was a cross-sectional study run from 1st March to 15 May 2022. A total of 436 participants were enrolled for the study. The *H. pylori* fecal antigen test was used to carry out this study. A structured questionnaire was designed and standardized. Data was collected through structured interviews. Data was entered into Microsoft Office Excel 2007 and analyzed using the SAS (Statistical Analyse System, California, USA) version 9.1.
Results: The prevalence of *H. pylori* was 42% (183/436). The participants had poor knowledge (76.10%) of the disease, its manifestations, and ways of prevention and management.
Conclusion: The prevalence of *H. pylori* among patients was 42%. The population had poor knowledge of the disease and they do not perceive it as a basic threat to them.

RESUME

Contexte: Les ulcères gastroduodénaux sont des plaies situées sur la paroi de l'estomac, la partie supérieure de l'intestin grêle ou la paroi de l'œsophage, qui peuvent provoquer des douleurs modérées à celles intenses. Les facteurs de risque des ulcères gastroduodénaux sont les suivants: l'infection à *Helicobacter pylori* (IHP), la prise régulière d'analgésiques, le syndrome de Zollinger-Ellison, la surproduction d'acide, le stress et de nombreux autres facteurs de risque associés. Cette étude a été réalisée dans la région du Sud-Ouest Cameroun, à l'hôpital régional de Buea. L'objectif de cette étude était d'évaluer la prévalence de l'ulcère gastroduodénal, les connaissances des patients sur la maladie, ses facteurs de risque, les mesures mises en place par les participants pour se prémunir et les modes de prise en charge de la maladie par les patients.
Méthodes : Il s'agit d'une étude transversale qui s'est déroulée du 1er mars au 15 mai 2022. Au total, 436 participants ont été recrutés pour l'étude. Le test d'antigène fécal *H. pylori* a été utilisé pour réaliser cette étude. Un questionnaire structuré a été conçu et standardisé. Les données ont été collectées par le biais d'entretiens structurés. Les données ont été saisies dans Microsoft Office Excel 2007 et analysées à l'aide de la version 9.1 de SAS (Statistical Analyse System, Californie, États-Unis).
Résultats : La prévalence de *H. pylori* était de 42% (183/436). Les participants avaient une faible connaissance (76,10%) de la maladie, de ses manifestations, des moyens de prévention et de prise en charge.
Conclusion : La prévalence de *H. pylori* chez les patients était de 42%. La population a une mauvaise connaissance de la maladie et ne la perçoit pas comme étant une menace fondamentale.

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Introduction

Helicobacter pylori is a gram-negative microaerophilic bacterium and is the main pathogenic factor of chronic gastritis, peptic ulcers and gastric cancers [1]. It is classified both by the WHO and the International Agency for Research on cancer as a class 1 carcinogen [2, 3] and the predominant bacterium that colonizes the stomach mostly during childhood [4]. Infection with *H. pylori* is considered as an important risk factor for gastric cancer as approximately 89% of all gastric cancers are attributed to *H. pylori* infection and the eradication of this infection is known to reduce gastric cancer incidence [5].

Furthermore, *H. pylori* infection has been associated with several extra digestive diseases such as iron-deficiency anemia and idiopathic thrombocytopenic purpura [6]. Peptic ulcer disease (PUD) are defects in the gastric and duodenal mucosa that extend through the muscularis mucosae [7] and is a major threat to the world's population over the past two centuries with a high morbidity and substantial mortality [8]. Some people who are not infected with *H. pylori* bacterium have PUD while some people infected with *H. pylori* do not develop PUD [9]. Risk factors of *H. pylori* infection include socioeconomic, environmental and physiological factors which involve age, low education, poverty, stress, meal intake irregularity, smoking, heavy alcohol intake, excessive intake of non-steroidal anti-inflammatory drugs (NSAIDs), and hygiene conditions. PUD is most commonly associated with *Helicobacter pylori* infection and use of NSAIDs [10, 11].

The prevalence of *H. pylori* infection (HPI) in Africa is among the highest in the world, while the incidence of gastric cancer is comparably low. Little is known about others symptoms related to HPI in Africa and the association with certain phenotypes of bacterial virulence [12]. In Africa, since the introduction of endoscopy (1980), more and more publications show that this disease occupies a significant place in the pathology of the Black African. In Cameroon, Mali, Togo and Congo the prevalence of the PUD was respectively 17.1%, 10.88%, 15.33% and 30.42% [5, 13].

Peptic ulcer disease causes its patients a lot of discomfort and pain. *H. pylori* infections are asymptomatic in majority of its subjects. The infection is usually diagnosed at advanced stages, characterized by severe pain and challenging treatment outcomes. Similary, poor knowledge of the disease its risk factors, results in neglect and poor management of PUD [14]. The aim of this study was to assess the prevalence of *Helicobacter pylori*, knowledge, preventive measures and coping strategy by the patients at the Buea Regional Hospital**.**

Methods

This was a cross-sectional study conducted among the population attending the Buea Regional Hospital, between 1st March to 15 May. The Buea Regional Hospital is located at Tea Road (Long Street), 63, Buea, Cameroon. Its situated next to the "Compagnie de Gendarmerie". It is a tertiary hospital with the capability of providing quality care to Cameroonians in the South West Region and beyond. The hospital has 279 staff, 20 departments, 16 specialists, 30 general practitioners, 180 nurses and 20 laboratory staff. The departments include: the medical Unit, the surgical Unit, the pediatric Unit, the maternity, the HIV/AIDS Unit, the laboratory Unit, the x-ray Unit, the hemo-dialysis Center, the tuberculosis Center, the theater Department and the outpatient Department (OPD). The target population were those who visited the Buea Regional Hospital and were requested to carry-out the *H. pylori* test by the doctor they consulted. The minimum sample size for the study was 352 patients, calculated based the Lorentz formula at 95% confidence interval [15].

n= $\frac{z^2pq}{e^2}$

Where n= the desired sample size
e=maximum error of estimated or level of precision set at 5% (0.05)
z = confidence level (constant) = 1.96
p= prevalence of a previous study 35.7% =0.357
q=1-p =0.643
n= 352 people

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Participants were enrolled using a convenient sampling approach. Prior to the enrolment of participants, study information was provided and then a written informed consent was obtained from each of them. A questionnaire was used to collect data for each eligible participant. Each participant was given a transparent screw capped, wide necked sterile container.

They were instructed to provide a stool sample occupying one third of the container and return to the laboratory within 30 minutes for the analysis. The stool samples were analyzed using the *H. pylori* fecal antigen test. The *H. pylori* antigen test kit each contained a white cassette and an antigen buffer which work on the principle of the double Elisa chromatography [16]. If *H. pylori* antigen was present at a concentration of 50mg/ml or greater, the result was the formation of a coloured band in the test region. If there was no *H. pylori* antigen in the sample, the test area remained colorless.The sample continued to migrate to the control area where Goat anti-mouse IgG antibody captured colloid gold antibody conjugate to form a pink to purple color, indicating that the test was working and the result was valid [16].

Questionnaire was designed, standardised and structured as follow: Socio-demographic and socio-economic informations of the participant (age, sex, address, Profession, level of education, marital status, monthly income, monthly expenses, daily food intake, type of water system used in house, type of toilet system used in your house, taking medication without a doctor's prescription, alcoholism, smoking), knowledge of the disease by the participants (gastritis knowledge, whether or not affected by gastritis, knowledge about the symptoms of gastritis, medication taken for pain, knowledge about the causes of this disease, measures put in place to prevent from being infected with this disease, knowledge about management of the disease).

The questions of knowledge of *H. pylori* were scored on 32 with a median of 16. Scores from 0 to 8 were said to be very poor, from 9 to 15 were poor, 16 to 28 were good and 29 to 32 very good.

Data was entered into Microsoft Office Excel 2007 and analyzed using the SAS (Statistical Analyse System, California, USA) version 9.1. Categorical variables were summarized as proportions and were analyzed using the Pearson's Chi-square test to observe the differences among the various groups.

Continuous variables were summarized as median with interquartile range. A chi square test was done to check for association between *Helicobacter pylori* and various socio-demographic and clinical variables. A p-value <0.05 was considered statistically significant while a p-value > 0.05 was considered statistically not significant.

Results

During the period of this study, four hundred and forty (440) patients were eligible for the study. However, four hundred and thirty-six (436) of them actually participated in the study. The other four (4) participants were too weak to answer the questionnaire and their care takers were not willing to help in the study. Of the 436 people that participated in the study, 183 (42%) were tested positive for the *H. pylori* antigen test (**figure 1**).

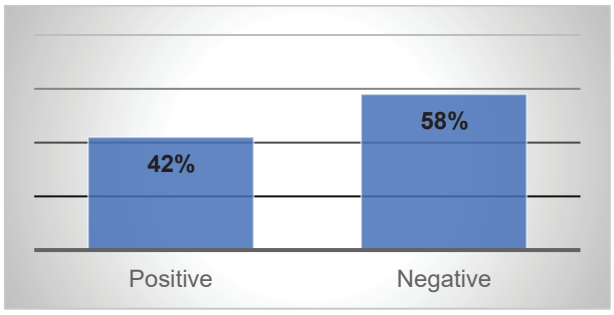

Figure 1: *H. pylori* positivity (n=436)

Of these 183 positive cases, we had 117 females (64%) (**figure 2**).

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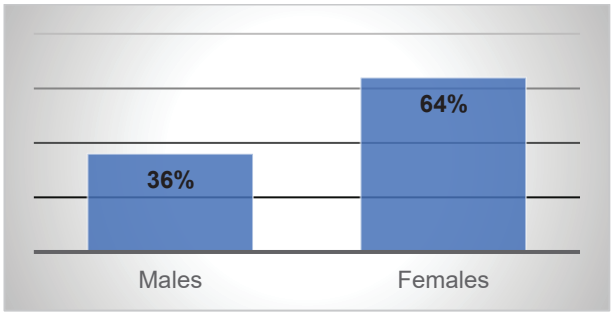

Figure 2: distribution of *H. Pylori* by sex (n=183)

The age group with the highest frequency of positive cases (77/183; 42%) were those between the ages 18-32 years (**figure 3**).

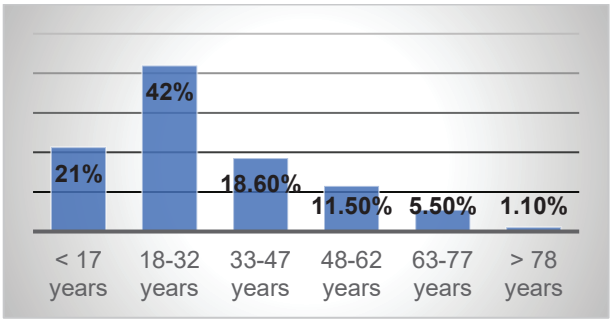

Figure 3: distribution of *H. pylori* by age groups (n=183)

By use of a structured questionnaire, the patients or their guardians were asked questions on their knowledge of the disease, 80 participants (18.35 %) said the disease was caused by a bacterial infection, 234 (53.70%) said it was due to the fact people skip meals (**table 1**).

Table 1: distribution of participant according to knowledge of the disease

Indicator	Frequency (n)	Percentage (%)
Knowledge of the disease		
Caused by bacterial infection	80	15.35
Due to excessive drug consumption	7	1.60
Due to the fact that people skip meals	23	53.70
Caused by stress	35	8.0
No knowledge on the disease	80	15.35
Total	436	100.00

A total of 332 participants (76.1%) had poor knowledge of the disease (**figure 4**).

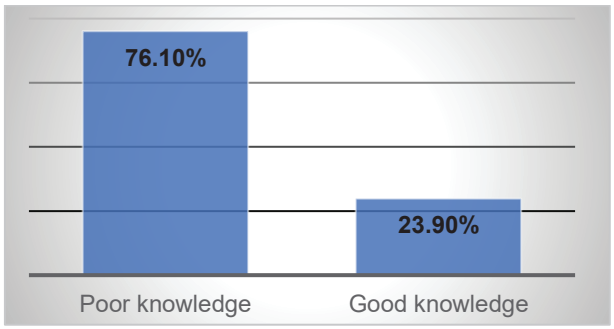

Figure 4: overall knowledge of patients about peptic ulcer disease (n=436)

The management of the disease was done certains methods such as; eating raw groundnuts, eating certain herbs, consuming a lot of vegetables, drinking a lot of water and eating fruits. These methods helped ease their pain.

Two hundred and forty-eight participants (52%) exercise good hygienic conditions of washing their hand and watching what they consume prevent PUD.

One herb mentioned by most of the participants was “masepo” (*Ocimum gratissimum*). They mentioned certain foods which they avoided such as koki beans, beans, unripe plantains, acidic fruits like lemons and others hard food substances (**table 3**).

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Table 2: prevalence of *H. pylori* based on sociodemographic characteristics

Sociodemographic Data		Frequency (n)	n (%) Test Positive for HP	P Value
Gender	Males	154	66 (36.1%)	0.782
	Females	282	117 (63.9%)	
Age	<17	90	39 (21.3%)	0.715
	18-32	171	77 (42.1%)	
	33-47	84	34 (18.6%)	
	48-62	54	21 (11.5%)	
	63-77	28	10 (5.5%)	
	>78	9	2 (1.1%)	
Level of education	Illiterates	2	0 (0%)	0.970
	Primary	120	52 (28.4%)	
	Secondary	109	44 (24.0%)	
	Tertiary	205	87 (47.5%)	
Occupation	Employed	73	35 (19.1%)	0.617
	Unemployed	21	7 (3.8%)	
	Self-Employed	138	57 (31.1%)	
	Student	204	84 (45.9%)	
Monthly Income (FCFA)	10000-50000	187	84 (45.9%)	0.462
	6 0000-10000	74	28 (15.3%)	
	100000-200000	80	32 (17.5%)	
	>200000	22	12 (6.6%)	
	N0 Allowances	73	27 (14.8%)	
Allowance On Food Per Month	<10000	16	7 (3.8%)	0.992
	10000-40000	181	75 (40.9%)	
	50000-100000	102	44 (24%)	
	>100000	50	21 (11.5%)	
	Those Who Don't Know	87	21 (11.5%)	
How Many Times Do You Eat In A Day	Depends On How Free I Am	74	28 (15.3%)	0.519
	Twice A Day	149	70 (38.3%)	
	Three Times A Day	168	68 (37.2%)	
	>Three Times	24	7 (3.8%)	
	Once	21	10 (5.5%)	
Type Of Water System You Drink	Cam Water	264	104 (56.8)	0.534
	Bore-Hole	71	36 (19.7%)	
	Well	21	9 (4.9%)	
	Streams	28	11 (6.0%)	
	Mineral Water	52	23 (12.6%)	
Type Of Toilet System	Flushing System	320	129 (70.5%)	0.243
	Pit Toilets	116	54 (29.5%)	
	Bucket Systems	0.0	0 (0.0%)	
Do You Drink Alcohol	Yes	284	115 (62.8%)	0.392
	No	152	68 (37.2%)	
Do You Smoke	Yes	115	47 (25.7%)	0.780
	No	321	136 (74.3%)	
Overall Score	Poor Knowledge	332	160 (87%)	0.725
	Good Knowledge	104	23 (12.6%)	
	Total	436	183 (100%)	

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Table 3: patient's preventive measures and ways they manage the disease.

Knowledge and responses		Frequency (n=436)	Percentage (%)
Preventive measures	Good hygiene	248	52
	Take drugs once you start experiencing symptoms	9	1.9
	Eat regularly and on time	140	29.4
	I don't know	80	16.7
Management	Avoid certain food types	173	34.3
	Eat more food	37	7.3
	By the use of drugs such as G tablet, Maalox or gaviscon	133	26.4
	Avoid staying for long hours without food	140	27.8
	Avoid drugs like ibuprofen and aspirins	21	4.2

Discussion

In our study, the prevalence of *H. pylori* was significantly high. Almost half of the study participants were found to be infected by *H. pylori* (42%). This prevalence is lower than the prevalence of 66.9% reported by Ngounouh *et al*. [17] in the Center region of Cameroon, among children. The age range difference in the studied population between the present and this study, could explain this observation. In fact, in our sampling processes, we included all age group, then adult is more responsible than young according to healthcare and prevention of disease. The prevalence of *H. pylori* in our study was almost the same as the prevalence of 43.4 reported by Agbor et al. [18] in the West region of Cameroon, among patients with gastritis. Our study might be considered low as others countries have a higher prevalence like: Jordan (77.5%), Iraq (78%), Kuwait (84%), Egypt (86%), Libya (76%), Morocco (75.5%), Tunisia (64%) [11].

The publication of a study carried out in 2021, from a study of files from 2015 to 2019 in Uganda was 35.7%, which was used as p value in our sample size calculation has a lesser prevalence than what we got from our study [15]. Looking back in comparison to the previous years, the prevalence of the HPI has increased. In term of gastrointestinal characteristics, it was found that participants having abdominal pain and family history of peptic ulcer were more prone to HPI. Usually, most peptic ulcer cases are caused by *H. pylori* and since *H. pylori* transmission is interfamilial, this can explain the high prevalence of *H. pylori* among these participants.

In this study, the greatest prevalence was amongst people of the age group 18-32 years (42%) which is in accordance with another study which has as highest age group infected 19-35 (39.4%) years [15] and this is associated with the fact most of these participants are in their productive age. The next age group are children <17years (21.3%) and this is associated to their poor hygiene and ever playful behavior and thus they are more prone to get in contact with the *H. pylori* bacterium. The prevalence of people between the ages 33-48 had a remarkable percentage of 18.6%. Majority of stressed individuals fall under this age group as they have a thousand and one things on their mind. Children's school fess, family upkeep, house rents and other bills to take care of and in effect they skip meals in order to save for the family and keep up with the long list of pending bills. The increase in prevalence can be associated to their occupational levels, monthly income and how much they spend on food in a month.

From our study, the majority of people who tested positive where students 84 (45.9%), in terms of monthly income, those with a low monthly income

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of 10,000-50,000 francs where the highest that tested positive (84 people, 45.9%) and with respect to how much they spend only on food stuff in a month, those who allocated 10000-40000francs on food monthly where the highest to be infected in their category with 75 (40.9%) positive cases.

Furthermore, due to the security instability in the South West region of Cameroon, the inhabitants live in fear thus increasing their stress as they have to worry about their lives, worry about where to live as their houses have been burnt, worry on how to provide for their families because they have no livelihood as the communities, they use to live in has become deserted [19]. By the distribution of sex, our study recorded a 0.56 ratio of males to females who tested positive for the HPI, thus our study records more females than males who tested positive, Meanwhile, previous studies estimate males are more at risk than females [20, 21]. The shift in predominance in females is possible due to the low level of education of the females we had in our study and their low level of income. This may also be associated to how stressed the women are as most have the responsibility to take care of children the house and yet still have to fend and provide for their families.

The overall poor knowledge (332, 76.1%) of the participants to the disease is of great alarm. From the 42% prevalence of this study, 160 (87.4%) where those who were graded with poor knowledge on gastritis and 23 (12.6%) had good knowledge about the disease. Thus, the poor knowledge of the disease accounts for the increase in prevalence.

From this study, it was disturbing to find out people eat when they are hungry 74 people (17.0%) said they eat when free, 149 people (34.2%) said they eat twice a day while 21 (4.8%) people eat just once a day but this shouldn't be the case as we eat because our body needs food and not necessarily because we are hungry. Due to this, many don't eat on time which results to the acid accumulation in the stomach and duodenum, which increases the risk of peptic ulcers [20]. However, they manage the disease locally by the use of some herbs, raw groundnut, the intake of milk, drink a lot of water and they say these methods helps relieves them of the pain and some participants said they manage the disease by avoiding the intake of certain food like unripe plantains (173, 34.3%) and drugs like ibuprofen, aspirins (21, 4.2%) as they provoke the epigastric pain [22].

Conclusion

The prevalence of *Helicobacter pylori* was 42% with more females being positive and mostly people of the age group 18-32 years. The study population has an overall poor knowledge (76.1%) of the disease and they do not see it as a basic threat to them. Our future perspective will be to investigate the prevalence of antibiotic resistance among individuals with *H. pylori* infections.

Study limitation

Some patients could not readily to provide their stool samples and thus slowed down the study.
Some patients were very week and thus couldn't help us with the desired information we need.
Some patients were overly uninterested in partaking in the study and as such refused or were rude.

Ethical considerations

An ethical clearance was obtained from the Faculty of Health Sciences, University of Buea, an authorization was also obtained from the Delegation of Public Health along with an approval from the Regional Hospital of Buea to carry out this study. These mentioned documents are found in the appendix. A consent form was also presented to all the participants of this study or their guardian if they were below 18 years old. Their signature on the consent form indicated their approval to part-take in this study. The consent form was attached to the questionnaire and those who refused to answer the questionnaire their samples and information were not collected.

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