

## PREVALENCE OF *HELICOBACTER PYLORI* INFECTION IN PATIENTS WITH GASTRO-DUODENAL DISEASES IN JOS, NIGERIA

<sup>1</sup>A A Samaila, <sup>2</sup>E N Okeke, <sup>2</sup>A O Malu

<sup>1</sup>Department of Medicine, Bayero University Kano/ Aminu Kano Teaching Hospital, Kano, Nigeria

<sup>2</sup>Department of Medicine, University of Jos/Jos University Teaching Hospital (JUTH), Jos, Nigeria

*Correspondence and reprint request to: Dr. A A Samaila*, Department of Medicine, Bayero University Kano/ Aminu Kano Teaching Hospital (AKTH), PMB 3452 Kano, Nigeria **eMail:- [samailaaa@yahoo.com](mailto:samailaaa@yahoo.com)**

### Abstract

**Background:** *Helicobacter pylori* (*H. pylori*) infection has become topical over the last three decades particularly with regards to its association with gastro-duodenal diseases. High prevalence rates of this ubiquitous bacterium have been reported in both symptomatic and asymptomatic subjects especially in low socioeconomic communities. **Objective:** The objective of this study was to determine the prevalence of *H. pylori* infection in patients with gastroduodenal diseases in Jos, Nigeria. **Methods:** A cross-sectional study of consecutive patients referred for upper gastrointestinal endoscopy was carried out at the Jos University Teaching Hospital (JUTH). At endoscopy two pairs each of antral and corpus gastric biopsies were taken from each patient and evaluated for the presence *H. pylori* infection using the rapid urease test. **Results:** The prevalence of *H. pylori* from this study was found to be 90.1% in those with organic disease at endoscopy (organic dyspepsia) and 84% in those with no pathology detected at endoscopy (non-ulcer dyspepsia). There was no statistically significant difference in the prevalence rates of *H. pylori* in the two groups. (p value 0.076). *The prevalence of the bacterium in patients with organic disease at endoscopy showed the highest prevalence in those with duodenal ulcer 16/17 (94.1%), followed by Duodenitis 6/7 (85.7%), gastritis 8/9 (88.9%) and gastric ulcer 1/2 (50%) respectively. Four out of five (80%) of those with reflux oesophagitis and 1/2 (50%) of those with candida oesophagitis also tested positive to H. pylori. One patient each who had Barrett's esophagus and hiatus hernia were negative for H. pylori.*

**Conclusion:** *Helicobacter pylori* infection is common among patients referred for upper gastrointestinal endoscopy irrespective of the underlying pathology. This may be a reflection of the generally high prevalence rates of this ubiquitous bacterium in the community. Therefore the presence of *H. pylori* infection should be interpreted with caution by clinicians before treatment. Evidence based protocols need to be developed by experts to guide clinicians in optimally caring for dyspeptic patients in our communities.

**Keywords:** Prevalence, *Helicobacter pylori*, Gastroduodenal diseases, Jos, Nigeria

### Introduction

Two Scientists Robin Warren and Barry Marshall in 1982 first characterized *Helicobacter pylori* (*H. pylori*) and described its association with histological gastritis and subsequently Peptic Ulcer Disease (PUD).<sup>1</sup> This bacterium is a gram-negative, micro-aerophilic, spiral shaped, flagellated bacillus which colonizes the mucus layer of the gastric epithelium<sup>(2)</sup>. *H. pylori* prevalence rates range from 30-40% in United States, 80-90% in South America and 70-90% in Africa.<sup>3-7</sup> It is more common in developing countries, and its prevalence increases with age from 20% among teenagers to 50-60% of subjects in the 6<sup>th</sup> and 7<sup>th</sup>

decades of life.<sup>7, 8</sup> To a large extent, the epidemiology of PUD reflects that of *H. pylori* infection, increasing dramatically with age.<sup>8</sup> Estimates of annual incidence of PUD in *H. pylori* infected individuals is about 6-10 fold higher than that for uninfected individuals.<sup>5</sup> In Europe, Australia and United States, 95% of duodenal ulcers and 60 – 70% of gastric ulcers are associated with *H. pylori*.<sup>9</sup> In Nigeria, almost 100% of duodenal ulcers and 82% of gastric ulcer patients are *H. pylori* positive.<sup>3</sup> Furthermore, evidence that links *H. pylori* to the development of PUD is the low recurrence rate of peptic ulcers, (less than 20% ) following

eradication of *H. pylori* compared to about 70% if left untreated<sup>(10)</sup>. This organism has also been strongly linked to the development of gastric cancer, with attributable risk of 46% and 53% in two different studies.<sup>11,12</sup>

Methods available for the diagnosis of *H. pylori* include invasive (via endoscopic biopsy specimens) and non-invasive tests (using blood and stool samples). The invasive tests include Gram stain, Histology, Rapid Urease Test otherwise known as *Campylobacter*-like organism (CLO) test and Culture which require endoscopy and gastric biopsy. The non-invasive tests include the reliable but expensive and highly technical Urea Breath Test (UBT), serology and Fecal Antigen Test (FAT).

The most reliable non-invasive test is the urea breath test with specificity and sensitivity approaching 100%.<sup>13,14</sup> It is however costly and not readily available in most developing countries. Other non-invasive tests include serological detection of serum antibodies to *H. pylori* infection and the stool antigen test are. However, while serological tests have the major disadvantage of not able to differentiate current and past infections, the faecal antigen test is not readily available in developing countries. Histology of endoscopically taken gastric biopsy has a very high sensitivity (96%) and specificity (98.8%) and is also cheap, albeit requires expertise.<sup>13,14</sup> Other invasive methods of detecting *H. pylori* are Gram stain and culture with sensitivities of 92.2% and 98.4% respectively.<sup>13-15</sup>

This study was aimed at determining the prevalence of *H. pylori* infection in various gastro-duodenal diseases among dyspeptic patients referred for upper gastrointestinal tract endoscopy in Jos, Nigeria.

### Materials And Methods

The study was a prospective cross-sectional study carried out at the Jos University Teaching Hospital (JUTH), Jos, Nigeria. One hundred and forty four patients of 18 years and above with uninvestigated dyspepsia consecutively referred to the Gastroenterology Unit of the JUTH for endoscopy were studied. Ethical approval for the study was obtained from the JUTH Ethical Committee and an

informed written consent was obtained from each patient before being recruited into the study. A detailed clinical history and physical examination was carried on each patient before endoscopy.

After an overnight fast (average of 8 hours), each patient had pharyngeal anesthesia using plain xylocaine spray. Upper gastrointestinal endoscopy was then performed on each patient using a fibreoptic Olympus GIF 2 T10 forward viewing fibreoptic endoscope. Two pairs each of antral and corpus gastric biopsies were taken from each patient and evaluated for the presence of *H. pylori* infection using the rapid urease test.

Results obtained were analyzed using SPSS version 15.0 statistical programme (SPSS Inc, Chicago IL, USA). A p value of <0.05 was considered significant.

### Results

One hundred and forty-four (144 study subjects made up of 58(40.3%) males and 86(59.7%) females were studied. One Hundred (69.4%) of the patients had normal findings at endoscopy {functional (non-ulcer) dyspepsia}, while 44 (30.6%) had various organic findings at endoscopy (organic dyspepsia).

The non-ulcer dyspepsia group were made up of 39 males (39%) and 61 females (61%) with a mean age of  $37.5 \pm 12.26$ SD, while the organic dyspepsia group on the other hand were made up of 19 (43.2%) males and 25 (56.8%) females with a mean age of  $38.4 \pm 12.08$ SD. There was no statistically significant difference in the mean ages of the two groups. (P value 0.073).

The prevalence of *H. pylori* from this study was found to be 90.1% in those with organic disease at endoscopy (organic dyspepsia) and 84% in those with no pathology detected at endoscopy (non-ulcer dyspepsia) {Table 2}. There was however no statistically significant difference in the prevalence of *H. pylori* infection in patients with organic and non-ulcer dyspepsia. (P value 0.076). While it was also observed in this study that the rate of infection by *H. pylori* increased progressively with increasing age (Table 1), there was no statistically significant age and sex differences; in the rates of infection. (P value 0.084; 0.054). Among the 44 patients with various organic diseases at endoscopy, the highest prevalence rate of *H. pylori* infection was found in those with duodenal ulcer

16/17 (94.1%), followed by Duodenitis 6/7 (85.7%), gastritis 8/9 (88.9%) and gastric ulcer 1/2 (50%) respectively. Four out of five (80%) of those with reflux oesophagitis and 1/2 (50%) of those with *Candida* oesophagitis also tested positive to *H. pylori*. One patient with Barrett's esophagus and another one with hiatus hernia were both negative for *H. pylori*. (Table 3).

**Table 1. Age distribution and prevalence of *H. Pylori* infection among study subjects**

Age group (yrs)	Proportion with <i>H. pylori</i> infection	Percentage (%)
15-19	4/6	66.7
20-24	10/13	76.9
25-29	17/22	77.2
30-34	15/19	78.9
35-39	18/22	81.8
40-44	18/20	90.0
45-49	13/14	92.8
50-54	14/15	93.3
55-59	5/6	83.3
60-64	2/2	100
65-69	2/2	100
70-74	3/3	100

**Table 2. Prevalence of *H. pylori* infection and type of dyspepsia in Jos, Nigeria**

Presence of <i>H. pylori</i>	Organic dyspepsia n=44	Non-ulcer dyspepsia n=100	Total
Present	40 (90.1%)	84 (84%)	124
Absent	4 (9.9)	16 (16%)	20
Total	44	100	144

**Table 3. Prevalence of *H. pylori* infection in gastroduodenal diseases in Jos, Nigeria**

Endoscopic Finding	Number tested positive (n) for <i>H. pylori</i>		Percentage (%)
Duodenal ulcer	17	16	94.1
Gastritis	9	8	88.9
Duodenitis	7	6	85.7
Gastric ulcer	2	1	50
Reflux oesophagitis	5	4	80
Candidiasis	2	1	50
Normal findings	100	84	84
Hiatus Hernia	1	0	0
Barrett's esophagus	1	0	0

## Discussion

The results of this study show that the percentage of dyspeptic patients with *H. pylori* infection was higher in the organic dyspepsia group (90.1%) as against the non-ulcer dyspepsia group (84%). Statistical analysis however, showed that this difference was not significant. The rather high prevalence of *H. pylori* infection in the two groups could be explained by the fact that in developing countries like Nigeria, majority of people acquire the infection early in childhood and most people are already infected by adulthood. Not only is age important but there are also marked ethnic variations in the frequency of infection in asymptomatic controls with a rate of 87% in Colombians of unspecified age,<sup>16</sup> 79% in Africans aged 7-66 (mean 26) years,<sup>17</sup> which are similar to the percentage obtained for non-ulcer dyspepsia in this study (84%). Relatively lower rates were however reported in Chinese (60%) aged 20-39 years,<sup>3</sup> 55% in Japanese aged 26-70 (mean 49) years<sup>18</sup> and 48% in Indians aged 26-70 years (mean 49 years).<sup>19</sup> The result of this study however agrees with the Maiduguri study in which Holcombe reported a prevalence rate of 70-97% in dyspeptic patients and 80% in asymptomatic volunteers.<sup>19</sup> The result of this study also agrees with another earlier study from Jos by Agatha and others who reported prevalence rates of 94% and 84.6% in symptomatic and asymptomatic subjects' respectively.<sup>20</sup>

This high prevalence of *H. pylori* observed in this study is also similar to reports from other parts of Nigeria where prevalence rates of between 73% and 84% were found.<sup>3, 15</sup> Studies in other African countries reported similar figures of 75%-85%.<sup>6, 17</sup> The result of this study also noted that 94.1% of patients with duodenal ulcer and 50% of those with gastric ulcer were infected with *H. pylori*. This is similar to reports from other studies in Nigeria as well as other parts of Africa, where prevalence rates of 90 - 100% and 60 - 90% were quoted for duodenal and gastric ulcers respectively.<sup>3, 6, 19</sup>

These observed differences may be related to the different sample sizes and diagnostic methods used in the various studies. Perhaps a multicenter study with a uniform (consensus) protocol would give

more accurate relative rates of infection by this ubiquitous bacterium across the country and beyond.

### Conclusions And Recommendation

*Helicobacter pylori* infection is common among patients referred for oesophago-gastro-duodenoscopy in Jos, Nigeria irrespective of the underlying cause of their dyspepsia. Evidence based protocols need to be developed by experts to guide clinicians in optimally caring for dyspeptic patients in our communities.

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