

## Original Article

### **Helicobacter pylori In Uninvestigated Dyspepsia In Primary Cares In Abakaliki, Nigeria**

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### Abstract:

There is paucity of information on the prevalence of *Helicobacter pylori* infection in Nigeria. Enzyme-linked immunosorbent assay (ELISA) was used to determine the prevalence of immunoglobulin G (IgG) antibodies to *H. pylori* in 262 consecutive patients (aged 5.5-56 years) presenting with dyspepsia in primary health cares in Abakaliki, Nigeria. Sixty-nine (26.3%) of the patients had IgG antibodies to *H. pylori*. Significantly higher prevalence of *H. pylori* was recorded in older patients than in those  $\leq 20$  years [29% vs 11% (95%CI: 0.072-0.288%)]. Infection was comparable between males and females [28% vs 25%, (95% CI: - 0.078 – 0.138)] but inversely related to the socio-economic status of patients [30.5% vs 14%. (95% CI: 0.054-0.28) and 30.3% vs 8.3% (95% CI: 0.053-0.391) between lower and middle and between lower and upper class respectively]. The high endemicity of *H. pylori* infection in this study needs confirmation in different settings and/or in the general population.

**Key Words:** *H. pylori*, infection, Prevalence, Dyspepsia, Ulcer

### Introduction:

The association between *Helicobacter pylori* infection and ulcer diseases has long been established with about 95% of patients with duodenal ulcers and more than 80% of patients with gastric ulcers being infected with the bacterium.(1,2) Additionally, studies have shown that *Helicobacter pylori* infection is a key factor in the aetiology of various gastrointestinal diseases such as chronic active gastritis without clinical symptoms of peptic ulceration, gastric adenocarcinoma and gastric mucosa-associated lymphoid tissue lymphoma.(3,4) In dyspeptic patients without *H. pylori* infection, it has been shown that ulcer disease is extremely rare and endoscopic examination is usually normal or shows evidence of oesophagitis (5,6) and in patients with dyspepsia and *H. pylori* infection, endoscopy shows underlying ulcer dis-

ease in 10-50%.(5-7) The prevalence of peptic ulcers in patients seropositive for *H. pylori* is seven times greater than in those who are seronegative.(8) Although the prevalence of infection is declining over time, the organism still infects approximately one half of the world's population (9) with prevalence varying from one country to another and developing countries more affected than the developed countries.(2) Existing evidence suggests that the diversity in disease outcome may be attributed to variations in the infecting strains.(10) In asymptomatic persons, the prevalence appears to be age related with adults more affected than the children.(11-13) However, childhood, low socio-economic status, poor household living conditions and no breast-feeding have been recognised as independent risk factors of *H. Pylori* infection.(14,15) Epidemiological studies suggest that faecal-oral spread of *Helicobacter pylori* potentially represents an important route of infection.(16) Holcombe et al. (17) in a random, serological survey of 268 subjects in Maiduguri, north central Nigeria, showed that 228 (85%) of the population studied had IgG antibodies to *H. pylori*. Fifty-eight of these subjects had experienced dyspepsia in the preceding 6 months with majority of the population (82%) infected between the ages of 5 and 10. In Nigeria there is paucity of information on the prevalence of *H. pylori* infection. The aim of this study is to determine the prevalence of *H. pylori* infection in patients presenting with dyspepsia in primary health cares in Abakaliki.

### Methods:

This study was conducted at the Departments of Chemical Pathology, Ebonyi State University Teaching Hospital (EBSUTH), Abakaliki. The study area is defined by longitude 8°E and latitude 6°N, elevated at 380ft above sea level. The vegetation characteristic is that of the tropical rain forest with an average annual rainfall of about 1,600mm and an average atmospheric temperature of

30°C. There are two distinct seasons, the wet and the dry seasons; the former takes place between April and October, while the latter occurs from November to March. The main occupation of the people is subsistence farming (mainly yam and cassava) with some animal husbandry and other professions and/ or activities such as civil service, trading, artisans, and stone quarrying.

Ethical Committee of Ebonyi State University Teaching Hospital (EBSUTH), Abakaliki approved the protocol for this study. Participants were consecutive referrals from general practitioners (GPs) in Abakaliki who came for laboratory investigations as part of evaluation for various dyspeptic complaints. The clinical presentation, diagnosis, drug treatment and duration of symptoms were noted. Those excluded from the study were patients that were previously treated for *H. pylori* infection or/and who were on antibiotics or/and proton pump inhibitors and histamine-2 receptor blocker two weeks prior to enrollment. Before enrollment, informed consent of the participants were sought and obtained. In all, a total of two hundred and sixty two patients (117 males and 145 females) aged 5.5 to 56 years were found to be eligible for the study. At entry into the study each participant was interviewed to obtain sociodemographic data such as age, sex, level of education and occupation.

Venous blood were obtained into dry glass test tubes for clotting and retraction after which serum were isolated by centrifugation at 2000g for two minutes and the serum used for the determination of specific immunoglobulin G (IgG) to *Helicobacter pylori*.

Determination of immunoglobulin G (IgG) to *Helicobacter pylori* was done by enzyme-linked immunosorbent as-

say (18). Socioeconomic status was assessed by occupation and level of education for adult participants and of the parents for children.

## Statistics

Data were analysed for mean and proportions expressed as percentage. We determined 95% confidence intervals where appropriate.

## Results

The mean age of the patients was  $38.6 \pm 5.2$  years. In the 262 patients studied, presenting symptoms include, heartburn [n= 45 (17%)], abdominal pain [n= 68 (26%)], bloating [n= 91 (35%)], vomiting [n= 58 (22%)]. The duration of symptoms ranged 6 months to 2 years (mean 1.1 years). Table 1 shows the age and sex related prevalence of *H. pylori* infection in dyspeptic patients. The overall prevalence was 26.3% (95%CI: 20.7-31.3%). Infection with *Helicobacter pylori* was significantly higher in older patients than in those  $\leq 20$  years [29% vs 11% (95%CI: 0.072-0.288%)]. Although there was no significant sex difference in the prevalence of *Helicobacter pylori* infection [28% vs 25%, (95% CI: - 0.078 – 0.138) between male and female], infection was significantly higher in the lower socio-economic class than in the middle and the upper class [30.5% vs 14%. (95% CI: 0.054-0.28) and 30.3% vs 8.3%, (95% CI: 0.053-0.391)] respectively] (Table 2).

**Table 1. Age and sex related seroprevalence of *H. pylori* in dyspeptic patients**

Age groups	Male			Female			Total		
	N	HP+(%)	95%CI	N	HP+(%)	95%CI	N	HP+(%)	95%CI
≤ 20	17	2 (12)	-3.5-27.5	30	3 (10)	-0.7-20.7	47	5 (11)	2.1-19.9
21-30	20	1 (5)	-4.6-14.6	58	23 (40)	27.4-52.6	78	24 (30.7)	20.7-41.3
31-40	31	14 (45)	27.5-62.5	45	9 (20)	8.3-31.7	76	23 (30.3)	19.7-40.3
41-50	44	15 (34)	20-48	10	1 (10)	-8.6-28.6	54	16 (29.6)	17.8-42.2
> 50	5	1 (20)	-15.1-55.1	2	0 (0)	-	7	1 (14.3)	-11.7-39.7
Total	117	33 (28)	19.9-36.1	145	36 (25)	17.5-32.1	262	69 (26.3)	20.7-31.3

N = Number examined; HP+ = *H. pylori* positive

**Table 2. Seroprevalence of *H. pylori* infection according to socio-economic class**

Socio Economic Class	Male		Female		Total	
	N	HP+(%)	N	HP+(%)	N	HP+(%)
Upper	8	1 (12.5)	4	0 (0)	12	1(8.3)
Middle	32	5 (15.6)	18	2 (11.1)	50	7 (14)
Low	77	27 (35.1)	123	34 (27.6)	200	61 (30.5)
Total	177	33 (18.6)	145	36 (24.8)	262	69 (26.3)

N = Number examined; HP+ = *H. pylori* positive

### Discussion

This study has established a high endemicity of *Helicobacter pylori* infection in patients with dyspepsia in this environment. However, *H. pylori* prevalence of 26.3% in the present study is lower than 50% reported by McColl et. al (19) elsewhere. It is also lower than 55.2% reported by Jaakkimainen et al (20) in a large meta-analysis of the prevalence of *H. pylori* in patients with non-ulcer dyspepsia. This shows that higher proportion (73.7%) of our patients were not infected with *H. pylori* and that symptoms of dyspepsia in these patients may not be ascribed to infection with the bacterium, suggesting the involvement of other aetiological factors. Although the relationship between *Helicobacter pylori* positive gastritis and symptoms of dyspepsia still remains controversial (20), bacterial cytotoxins, phlogosis mediators, activity of chronic gastritis *Helicobacter*-related and host immune response probably play important role in pathogenesis of dyspepsia.(3) It has been shown that about 50% of *H.*

*pylori* strains produce cytotoxins (21), of which some have been specifically linked to active gastritis and peptic ulceration with the highest percentage of strains producing cytotoxin found in subjects with peptic ulcer disease compared with nonulcer dyspepsia.(22) *H. Pylori* strains from subjects with ulcer disease commonly produced vacuolating cytotoxin, suggesting that it may be a virulence factor in the pathogenesis of peptic ulcer disease. Recent meta-analyses indicated that eradication of *H. pylori* is effective in resolving symptoms in *H. pylori* positive non-ulcer dyspepsia.(23-25) Additionally, eradication of *H. pylori* has been found to remove increased risk of developing actual ulcer disease (26-27), remove concern about a potential adverse interactions between the infection and subsequent long term use of proton-pump inhibitors (28), and remove an important risk factor for gastric cancer and lymphoma.(29) However, Wu et. al. (30) in a double blind, placebo controlled randomized trial showed that *H. pylori* eradication leads to more

resilient gastro-oesophageal reflux disease. In the present study, infection with *H. pylori* was assessed serologically. It is likely that the prevalence will be higher if biopsy-based methods such as culture, histological examination, assays for urease activity and molecular typing by polymerase chain reaction (PCR) amplification methods for the identification of *H. pylori*-specific genes had been used.(31,32) Additionally, only a minority of patients infected with *H. pylori* will ever suffer serious consequences from their infection (9,33), and by extrapolation, represents those presenting with dyspepsia. Hence the value reported might be an underestimation of the actual prevalence in the general population. It has been found that the prevalence of peptic ulcer is higher in the general population and very much higher in patients with *H. pylori* infection than in those with *H. pylori* seronegative result. Also malignancy has been associated with *H. pylori* seropositivity (8,34), suggesting that 26.3% of our patients were at risk of ulcer diseases or/malignancy. For dyspeptic patients without *H. pylori* infections, gastric dysmotility, modifications of gastric output or altered visceral sensibility, psychological factors, gastroesophageal reflux and irritable bowel may be responsible for the symptoms of dyspepsia.(35-37) Also, some lifestyles such as heavy drinking or smoking, poor diet or prolonged NSAID use have been associated with symptoms of dyspepsia but not of *H. pylori* infection.(38) The lower prevalence of *H. pylori* infection in persons under the ages of 20 years than in the elderly corroborates earlier reports (39-40) where the prevalence was higher in adults than in children. Available evidence has shown that although *H. pylori* is acquired early in life through personal contact (children) in their environment (especially in developing countries) and from one family member to another, possibly by the faecal-oral route, or by the oral-

oral route, e.g., kissing, vomitus (in developed countries) the bacterium tends to persist for life time if untreated.(41-44) *Helicobacter pylori* has the propensity to become a coccoid form which may represent a persistent form in which it can exist in the environment and may partly explain the higher prevalence of the bacterium in older patients in the present study, however, it has yet to be shown that it can revert to the replicative form.(45) Apart from age-related difference in the prevalence of *H. pylori*, inverse correlation exists between socio-economic status and infection with *H. pylori*.(46,47) This is in corroboration with the present finding of higher prevalence of infection in lower socio-economic class than the middle and/or upper class. It is also consistent with earlier reports, which show that the higher infection rate in adults is independent of socio-economic class, but in children was inversely related to the socioeconomic class of the child's family.(38) Waterborne transmission, probably due to fecal contamination, may be an important source of infection in this population as *H. pylori* has been found in faeces, sewage and water.(16) Majority of our patients (76.3%) were of lower socio-economic background and may have limited access to portable water. Abakaliki like other semi-urban cities in Nigeria is faced with acute shortage of portable water especially in the dry season making people to resort to well water and other sources of water supply for drinking and other domestic activities. Waterborne transmission of *H. pylori* is possible, especially in areas where untreated water is consumed.(42) Studies have linked clinical *H. pylori* infection with consumption of *H. pylori*-contaminated well water.(11) The lack of significant sex difference in patients presenting with dyspepsia and *H. pylori* infection in this study corroborates earlier reports.(48) This is expected since both sexes are equally exposed. However, female are known to be more susceptible to some kind of

infections than men due to hormonal influence. In conclusion, *H. pylori* infection is endemic in patients presenting with dyspepsia in Abakaliki, although the prevalence recorded was lower than those observed in similar patients elsewhere. It should however be noted that only patients attending primary health cares were studied and the possibilities of having higher prevalence in other health (secondary and tertiary) settings and/or in the general population is not unlikely.

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