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Full Length Research Paper

Prevalence of *Helicobacter pylori* infection among dyspepsia patients in Ibadan, South West Nigeria

Adeniyi, Bolanle A.[1*], Otegbayo, Jesse A.[2], Lawal, Temitope O.[1], Oluwasola, Abideen O.[3], Odaibo, Georgina N.[4], Okolo, Clement[3], Ola, Samuel O.[2], Idowu, Philip A.[1], Akere, Adegboyega[2] and Kehinde, Aderemi O.[5]

[1]Department of Pharmaceutical Microbiology, University of Ibadan, Ibadan, Nigeria.
[2]Department of Medicine, University of Ibadan, Ibadan, Nigeria.
[3]Department of Pathology, University of Ibadan, Ibadan, Nigeria.
[4]Department of Virology, University of Ibadan, Ibadan, Nigeria.
[5]Department of Medical Microbiology, University of Ibadan, Ibadan, Nigeria.

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Helicobacter pylori **infection is typically acquired shortly after birth in both low and high-income regions of the world and once the infection is established, it commonly persists life long unless treated. This infection has been identified as an important risk factor for the development of peptic ulcer disease and is probably the most important cause of relapse in those previously treated for peptic ulcer disease. The aim of this study was to determine the prevalence of *H. pylori* infection in patients with peptic ulcer disease at the University College Hospital (UCH) Ibadan; South West Nigeria. Fifty-two (52) patients who had symptoms of dyspepsia were recruited for the study and each of them went through endoscopy. Forty-three (43) (82.7%) of the patients were diagnosed with peptic ulcer disease while nine (9) (17.3%) patients were diagnosed normal. The presence of *H. pylori* was determined using culture and Urease Breath Test (UBT). The culture result showed that thirty-five (35) (81.4%) of the patients diagnosed with peptic ulcer disease had *H. pylori* infection also, eight (8) (88.9%) of the normal patients were culture positive for *H. pylori*. The UBT result showed that 65.1% of the diagnosed peptic ulcer patients were positive for *H. pylori,* also 55.6% of the normal patients were found UBT positive for *H. pylori.* In all, *H. pylori* infection is very common among dyspepsia patients and the organism is closely associated with the disease in South West Nigeria.**

Key words: *Helicobacter pylori*, dyspepsia, urea breath test, South West Nigeria.

INTRODUCTION

Helicobacter pylori is a gram negative, micro-aerophilic spiral shaped, flagellated, bacillus which colonize the mucus layer of the gastric epithelium (Marshall et al., 1985). The organism tests positive for oxidase, catalase and urease. *H. pylori* infection is common world wide with prevalence rates ranging 30 to 40% in the United States, 80 to 90% in South America and 70 to 90% in Africa (Genta, 2002; Perez-Perez et al., 2005; Tsai et al., 2005; Ndububa et al., 2001). It is more common in developing countries, and its prevalence increases with age from 20% among teenagers to 50 to 60% of subjects in the 6th and 7th decades of life. Although spirochetes have been described in gastric mucosa of humans since the early 1900, it was Robin Warren and Barry Marshall who in 1982 first characterized *H. pylori* and described its association with histologic gastritis and subsequent peptic ulcer disease (PUD) - defects in the gastrointestinal mucosa that extend through the muscularis mucosa (Marvin and John, 1999). This agent is now regarded as the most important risk factor for developing PUD. To a large extent, the epidemiology of PUD reflects that *H. pylori* infection, increases dramatically with age (Kurata,

*Corresponding author. E-mail: baadeniyi@yahoo.co.uk.

Table 1. The gender distribution of the dyspepsia patients.

Gender	Number	Percentage
Female	35	67.3
Male	17	32.7
Total	52	100

1993). Estimates of annual incidence of PUD in *H. pylori* infected individual is about 6 to 10 fold higher than that for uninfected individuals (Nomura et al., 1994; Martin et al., 1989). In Europe, Australia and the United States, 95% of duodenal ulcers and 60 to 70% of gastric ulcers are associated with *H. pylori* infection (McLoughlin et al., 2005; Borody et al., 1991).

In Nigeria, almost 100% of duodenal ulcer and 82% of gastric ulcer patients are *H. pylori* positive (Ndububa et al., 2001). Further 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 *H. pylori* is not eradicated (Fischbach et al., 2009; Hopkins et al., 1996). Methods available for diagnosis of *H. pylori* include; invasive (via endoscopic biopsy specimens) and non invasive tests. The most reliable non invasive test is the urea breath test (UBT) with specificity and sensitivity approaching 95 to 100% (Michel et al., 2009; Cutler, 1996; Thijs et al., 1996). It is however costly and not readily available in most developing countries. Other non invasive tests like serological detection of serum antibodies to *H. pylori* infection and the stool antigen test are also not widely available. Histology of endoscopically taken gastric biopsy has a very high sensitivity (96%) and specificity (98.8%) and also cheap, albeit it requires expertise (Cutler, 1996; Thijs et al., 1996). Other invasive methods of detecting *H. pylori* are Gram stain and culture with sensitivities of 92.2 and 98.4% respectively (Cutler, 1996; Thijs et al., 1996; Oyedeji et al., 2002). The extent of association of *H. pylori* with peptic ulcer disease is not well ascertained in South – Western Nigeria. The aim of this study was to determine the prevalence of *H. pylori* infection in patients with peptic ulcer disease at the University College Hospital (UCH) Ibadan, South West, Nigeria.

MATERIALS AND METHODS

The study was conducted at the Gastroenterology unit of University College Hospital (UCH) and at the Department of Pharmaceutical Microbiology, Faculty of Pharmacy, University of Ibadan, between February, 2009 and December, 2009. Fifty-two (52) patients with dyspepsia symptoms were recruited for the study. Asymptomatic individuals (50) from remote villages were recruited as controls.

Urea breath test

All the subjects were given a urea capsule to swallow using 10 ml of pure water and after a period of 10 min each of the subjects were given a heliprobe breath card to deeply blow air through the card from their mouth until there was adequate colour change on the breath card. The breath card was then read using heliprobe machine to determine the presence of *H. pylori* infection in the subject.

Biopsy specimens and culture

Gastric mucosal antral biopsy specimens were collected from each of 52 consecutive dyspeptic patients undergoing endoscopy. Gastric biopsy specimens were placed in sterile tubes containing 0.5 ml of transport medium consisting of sterile physiological normal saline and were kept at 4°C. The interval between the removal of the specimens and the inoculation onto culture media did not exceed 3 h. The biopsy specimens were removed from the transport tubes and placed in a fresh sterile tube containing 0.5 ml saline.

The biopsy specimens were then finely minced in a tissue grinder to dislodge the organisms. One hundred microliters (100 µL) from each solution was placed for isolation onto Mueller-Hinton agar plates. The plates were incubated in 100% humidity, at 37°C for up to 7 days in a microaerophilic gas mixture composed of 10% CO_2, 5% O_2, and 85% N_2 (Campy-path; unipath S.P.A., Garvagabnate Milanese, Milan, Italy). The agar plates were checked for growth from day 3 through day 7. An isolate was identified as *H. pylori* on the basis of positive catalase, oxidase, and urease reactions; typical colony morphology (small round colonies), and the presence of characteristic curved Gram-negative bacilli on Gram-stained smears. The identified colonies were then subcultured in alkaline pepton water.

RESULTS AND DISCUSSION

A total of One hundred and two individuals (102) were recruited for the study. Fifty two (52) were patients who had dyspepsia symptoms and had endoscopy while the remaining fifty (50) were the asymptomatic individuals from remote villages recruited as controls. The average age of the combined study subjects was 49.6 years with 41 to 70 years age group having the highest frequency. Peptic ulcer disease (PUD) was found in 43 (82.7%) of the patients and 9 (17.3%) had normal endoscopic finding. The high rate of PUD (82.7%) found in this study corroborate the fact that the incidence of *H. pylori* infection is more prevalent in the developing nations particularly among the rural dwellers. Tables 1 to 6 show the various result of the study. Our study shows that PUD is quite common in our environment (South West Nigeria), accounting for about 82.7% of all patients who had dyspepsia symptoms and upper gastrointestinal (GI) endoscopy during the study period. The study also showed that PUD is not quite common in young age groups with most patients being more than forty years. This is in line with what was found in Europe, where most peptic ulcer disease patients were usually more than forty years of age, (ACPR, 1985; EHPSG, 1997).

The result of this study noted that 81.4% of patients with gastric ulcer were infected with *H. pylori*. This is similar to reports from other studies in Nigeria and other

Table 2. The distribution of *H. pylori* among the dyspepsia patients culture using urease breath test (UBT).

Gender	Total number	Positive culture	Positive UBT	Negative culture	Negative UBT
Female	35	30	26	5	9
Male	17	13	7	4	10
Total	52	43	33	9	19
%	100	82.7	63.5	17.3	36.5

Table 3. Comparison of culture and urease breath test (UBT) as a method of *H. pylori* Identification.

Breath test	Positive culture	Negative culture	Total
Positive UBT	31	2	33
Negative UBT	12	7	19
Total	43	9	52

Table 4. Age distribution of *H. pylori* among the female dyspepsia patients.

Age (years)	Positive culture	Negative culture	Total number of female
1 – 10	0	0	0
11 – 20	1	0	1
21 – 30	5	0	5
31 – 40	5	3	8
41 – 50	9	0	9
51 – 60	4	0	4
61 – 70	4	1	5
71 – 80	1	1	2
81 – 90	1	0	1
Total	30	5	35

Table 5. Age distribution of *H. pylori* among the male dyspepsia patients.

Age (years)	Positive culture	Negative culture	Total number of male
1 – 10	0	0	0
11 – 20	0	0	0
21 – 30	0	3	3
31 – 40	3	0	3
41 – 50	3	1	4
51 – 60	5	0	5
61 – 70	2	0	2
71 – 80	0	0	0
81 – 90	0	0	0
Total	13	4	17

parts of Africa, where *H. pylori* prevalence of 60 to 90% were quoted for gastric ulcers (Ogutu et al., 1989; Ndububa et al., 2001). The report is also similar to that experienced in Asia where *H. pylori* prevalence in duodenal ulcer patients was reported to be 81.5%; although rather lower prevalence was reported in gastric ulcer patients than the African experience (Lee et al., 1993). It is noteworthy that even patients who had normal findings on endoscopy had a very high prevalence of *H. pylori* (88.9%). The association between *H. pylori* and

Table 6. The result of urea breath test conducted on 50 subjects who had no endoscopy and no symptoms of dyspepsia.

Age	Male			Female		
	No of subjects	Positive UBT	Negative UBT	No of subjects	Positive UBT	Negative UBT
1 – 10	0	0	0	0	0	0
11 – 20	3	2	1	1	1	0
21 – 30	0	0	0	2	2	0
31 – 40	1	1	0	2	2	0
41 – 50	1	1	0	5	4	1
51 – 60	1	0	1	6	6	0
61 – 70	7	6	1	10	9	1
71 – 80	5	5	0	5	4	1
81 – 90	0	0	0	1	1	0
91 – 100	0	0	0	0	0	0
Total	18	15	3	32	29	3

PUD compared to non-ulcer dyspepsia was not found to be statistically significant. This is probably because of the very high prevalence of *H. pylori* infection of about 80 to 85% even in the healthy population of Nigeria (Oluwasola et al., 2002).

Conclusion

The lack of non invasive screening tests for *H. pylori,* and the paucity of endoscopy facilities in Nigeria would result in a lot of patients being empirically treated for PUD based on rational clinical evaluation. Thus, there may be need to treat for *H. pylori* infection in patients with suspected PUD in our environment in view of the established high rate of recurrence of PUD in the presence of *H. pylori* (Hopkins et al., 1996).

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