

Prevalence of *Helicobacter pylori* antibodies among patients in University of Port Harcourt Medical Center and Braithwaite Memorial Specialist Hospital, Port Harcourt

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Abstract: Prevalence of *Helicobacter pylori* antibodies among patients that attended University of Port Harcourt Medical Center (UPMC) and Braithwaite Memorial Specialist Hospital (BMSH), Port Harcourt was investigated. The study determined the prevalence of *H. pylori* specific antibodies in blood samples of patients that attended both medical facilities (UPMC and BMSH). The study population consisted of 100 patients in the ratio of 0.5 from each hospital. *Helicobacter pylori* rapid test kit (ANTI-HP Rapid) was used to qualitatively detect antibodies to *H. pylori* in serum of subjects that were investigated and questionnaires containing information about the age, sex and other demographic details were also obtained from patients and recorded. The results obtained gave 22 (44.0%) for UPMC and 22(44.0%) for BMSH, indicating that there was no significant difference ($p < 0.05$) among patients with the infection in both hospitals. This shows that the infection is predominant in the area irrespective of location. Similarly, the infection was not predominant with any sex since the ratio of male to female gave 42.9: 44.8 %. However, there was a significant difference ($p > 0.05$) in the infection in relation to age and marital status, as a low prevalent rate was observed in children (23.0%) than in adults (57.4%) and there was a slight increase in the infection among married couples (56.5%) than in unmarried class (40.3%). The prevalence of *H. pylori* infection in the study centers calls for routine screening of blood for health education to enlighten the populace on the risk factors associated with the infection.

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1. Introduction

Helicobacter pylori (*H. pylori*) are causally related to serious disorders of the gastrointestinal tract (which includes peptic ulcer diseases, acute and chronic active gastritis) in children and adults (Lee *et al* 2003; Waleed *et al*, 2010). *H. pylori* is a Gram negative bacterium responsible for widespread of stomach ulcer (Bontems *et al.*, 2003). The age at which this bacterium is acquired seems to influence the possible pathologic outcome of the infection: people infected with it at an early age are likely to develop more intense inflammation that may be followed by atrophic gastritis with a higher subsequent risk of gastric ulcer, gastric cancer or both. Acquisition at an older age brings different gastric changes more likely to lead to duodenal ulcer (Brown 2000). Ingestion of bacteria which is the most likely portal of entry may occur by one or a combination of three means: oral-oral, gastro-oral, or fecal-oral (Malfertheiner *et al.*, 2010) routes. Oral-oral transmission can be potentiated by specific eating habits, such as pre-mastication of food by mothers before feeding children in some African countries and

the use of chopstick and communal eating in some immigrant Chinese communities.

Although the chopstick hypothesis have been challenged (Malfertheiner *et al.*, 2012), once infection occurs, it persists for years, often for life. About 10 to 20% of infected patients develop ulcers even though 80% of those infected are asymptomatic (Waleed *et al*, 2010; Bontems *et al.*, 2003). Studies indicated that 65 to 80% of patients with gastric ulcers and 95% of those with duodenal ulcers are infected with *H. pylori* (Waleed *et al*, 2010; Massarrat *et al.*, 1995).

The thinning of the protective mucous layer at the site of infection probably accounts for the development of peptic ulcer of the stomach and duodenum (Nester *et al.*, 1998). It has also been reported that infections are usually acquired in early childhood (Kusters *et al.*, 2006). However, the rate of infection in developing nations is higher than in developed nations, which is likely due to poor sanitary conditions (Solomon and Ibe, 2012).

In developed nations, it is currently uncommon to find infected children, but the percentage of infected people increases with age, with about 50% infected for

those over the age of 60 compared with around 10% infection between 18 and 30 years (Pounder and Ng, 1995; Wosu-Kinika *et al.*, 2015). The higher prevalence among the elderly reflects higher infection rates when they were children rather than infection at later ages (Kusters *et al.*, 2006). Despite high rates of infection in certain areas of the world, the overall frequency of *H. pylori* infection is declining (Malaty, 2007). Available primary data obtained from medical personnel revealed incidence of stomach ulcer (caused by *H. pylori*) among Port Harcourt residents. However, there is the need to know the prevalent rate of the *H. pylori* infection as this is necessary if any effort aimed at its treatment and control must be successful.

There is little or inadequate literature on the prevalence of *Helicobacter pylori* infection and associated risk factors in Nigeria. The objective of this study therefore, was to determine the prevalence of *Helicobacter pylori* specific antibodies in blood samples of patients that attended University of Port Harcourt Medical Center (UPMC) and Braithwaite Memorial Specialist Hospital (BMSH) in Port Harcourt, Rivers State, Nigeria.

2. Materials and Methods

2.1 Sample collection

A total of 100 samples were collected from the University of Port Harcourt Medical Center and Braithwaite Memorial Specialist Hospital, Port Harcourt respectively. The study population consisted of 100 patients in the ratio of 0.5 from each hospital. The study was conducted between the months of February and May, 2014.

About 5 ml of samples were aseptically collected from the subjects by venu-puncture into anti-coagulant free blood sample bottles. A short questionnaire containing information about the age, sex and other demographic details were also obtained from patients and recorded.

2.2 Serological test

The blood samples collected were left to clot by centrifuging at 2000rpm for 10minutes. Sera were then separated from the clots and stored at room temperature ($25 \pm 8^{\circ}\text{C}$) in labeled bottles until it was assayed the same day. Each serum sample was tested for the presence of antibodies to *Helicobacter pylori* using rapid test kit (ANTI-HP Rapid) for the qualitative detection of antibodies to *Helicobacter pylori* in serum samples.

The following quality control mechanisms were adopted in accordance with the test kit manufacturer's instructions; the use of fresh specimen, avoidance of repetitive freezing of blood samples, use of valid test kit (Cheesbrough, 2004; Stanier *et al.*, 1987; Talaro and Talaro, 2002).

2.3 Statistical analysis

Statistical analyses were performed using the SPSS statistical package for Windows; the 95% confidence interval for key proportions was calculated using the exact binomial distribution. The chi square test was used to test the differences in proportion when appropriate; differences with $P > 0.05$ were deemed significant.

3. Results

The results are presented in Tables 1 to 4. These included the prevalence in relation to location, prevalence in relation to sex, prevalence in relation to age group and prevalence in relation to marital status.

3.1 Prevalence in relation to location

Table 1 indicated that 22(44.0%) of test samples collected from BMSH and 22(44.0%) test samples out of the 50 tested samples collected from UPMC tested positive to *H. pylori* antibodies.

Table 1: Prevalence of *H. pylori* antibodies in relation to location

Location	Number tested (%)	Number positive (%)
UPMC	50 (50.0)	22 (44.0)
BMSH	50 (50.0)	22 (44.0)
Total	100 (100.0)	44 (44.0)

3.2 Prevalence in relation to sex

Forty two (42) of the 100 tested samples from BMSH and UPMC were male, out of which 18(42.9%) tested positive to *H. pylori* antibodies and 58 were female, out of which 26(44.8%) tested positive to *H. pylori* antibodies as shown in Table 2.

Table 2: Prevalence of *H. pylori* antibodies in relation to sex

Sex	Number tested (%)	Number positive (%)
Male	42 (42.0)	18 (42.9)
Female	58 (58.0)	26 (44.8)
Total	100 (100.0)	44 (44.0)

3.3 Prevalence in relation to age group

Table 3: Prevalence of *H. pylori* antibodies in relation to age group

Age bracket	Number tested (%)	Number positive (%)
0-18	39 (39.0)	9 (23.0)
19-37	61 (61.0)	35 (57.4)
Total	100 (100.0)	44 (44.0)

Thirty nine (39) out of the 100 samples collected from patients in BMSH and UPMC were within the age brackets of 1 to 18 years, out of which 9(23.0%)

tested positive to *H. pylori* antibodies and 61 were within the age brackets of 19 to 37. From this, 35(57.4%) tested positive to *H. pylori* antibodies as shown in Table 3.0.

3.4 Prevalence in relation to marital status

Seventy seven (77) samples of the 100 tested in BMSH and UPMC were single, out of which 31(40.3%) tested positive to *H. pylori* antibodies and 23 were married from which 13(56.5%) tested positive to *H. pylori* antibodies (Table 4).

Table 4: Prevalence of *H. pylori* antibodies in relation to marital status

Marital status	Number tested (%)	Number positive (%)
Married	23 (23.0)	13 (56.5)
Single	77 (77.0)	31 (40.3)
Total	100 (100.0)	44 (44.0)

3.5 Interpretation of result

Results were interpreted based on the criteria contained in the manufacturer's information on the test kit; Negative: only one pink band appears on the test region of the cassette. This indicates that there is no detectable anti-HP in the serum. Positive: Two pink bands appear on the test region of the cassette. This indicates that the serum contains detectable amount of anti-HP. Invalid: if without colour band appears on the test region, this is an indication of a possible error in performing the test. The test was repeated using a new device each time it was done.

4. Discussions

The study focused on the prevalence of *Helicobacter pylori* antibodies among patients who attended University of Port Harcourt Medical Center and Braithwaite Memorial Specialist Hospital, Port Harcourt, Rivers state, Nigeria. *H. pylori* infection is common in developing countries with a very high prevalence (Lee *et al.*, 2003). There are significant differences ($p < 0.05$) in the occurrence of infection worldwide and even in various parts of any specific country. This is closely related to socioeconomic status and overcrowding (Abdolvahab *et al.*, 2006). It has been reported that in developing countries, the prevalence rate is higher since most of the people belonged to either low or intermediate socioeconomic class (Waleed *et al.*, 2010). The prevalence increases generally with age, but decreases have been noted in narrow age ranges in childhood (Prescott *et al.*, 2005). Although *H. pylori* have been widely reported to be co-infected with other infections and diseases such as HIV, dyspepsia, anemia (Ramadas *et al.*, 2005; Magdy *et al.*, 2012), the study was generally targeted at patients who attended the health centers on the basis of age, sex, location and marital status.

In Table 3.1, the results obtained indicated that the infection was present in almost half (44%) of the study population (100 patients) from both hospitals, this is in line with the high prevalent rate earlier reported in some developing countries (Lee, 2003). The results of 42.9% and 44.8% of the male and female patients respectively in Table 3.2 indicated that *H. pylori* is not peculiar to either the male or female sex but, the infection is common to both sexes. This is similar to a scenario in Bangladesh where it was reported by Lee *et al.* (2003) that there was no significant difference ($P < 0.05$) of the infection in relation to sex (male: female=68.4%: 70.1 %).

It only depended on who is susceptible to the infection. The susceptibility and risk factors for *H. pylori* infection include socioeconomic status, household crowding, ethnicity, migration from high prevalence regions, and infection status of family members (Abdolvahab *et al.*, 2006; Atlas, 1995). In Table 3, the result of *H. pylori* infection in relation to age indicated that there is a low prevalence rate of the infection (23%) in children (1-18years) when compared to the prevalent rate of 57.4% obtained in adults (19-37years). This is in agreement with the report of Joav *et al.* (2004), who found out a similar situation. He reported that Israel had a low prevalence rate among children (10 %), but a rapid increase in the second decade of life to 39% and reached 79 % in persons over 60 years of age. Our study indicated an overall prevalent rate of 34.4 % of the infection in relation to age. The infection was more in the marital class (56.5%) than the unmarried class (40.3%) and this can be attributable to stress, and family responsibility among other factors.

5. Conclusion and recommendations

Results indicated that there was no significant difference ($p < 0.05$) in the occurrence of *H. pylori* infection with respect to location. Both sexes were susceptible to *H. pylori* infection in the area, with a low prevalent rate in children than in adults and a slight increase among married couples than in the unmarried class. The study has shown that *H. pylori* infection is common and constitutes a major public health challenge in Port Harcourt city.

Hence, it is recommended that routine screening of blood for *H. pylori* be carried out regularly. Health care personnel should be encouraged to do more in areas of public education and enlightenment campaign on the risk factors associated with *H. pylori* infection. Curative measures should be initiated and strengthened by the State Government to cope with existing cases of *H. pylori* infection amongst patients.

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