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PREVALENCE AND RISK FACTORS FOR HELICOBACTER PYLORI INFECTION AMONG OUT PATIENTS WITH GASTROINTESTINAL TRACT DISORDER IN ABIA STATE UNIVERSITY TEACHING HOSPITAL, ABA, SOUTH EASTERN NIGERIA.

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ABSTRACT

Helicobacter pylori (H. pylori) constitute the major aetiologic agent of many diseases in the gastrointestinal tract. This cross-sectional study aims at determining the burden and risk factors for infection in our centre. Relevant clinical and socio-demographic data were obtained. Serology tests were carried out. Of the 100 participants, 30 were males while 70 were females; with male: female ratio of 1:2.5. Age range was 10 to 85 years, with a mean age of 36±21.1 years. Age group 31-40 years had the highest number of participants. Of the 100 samples, 60 were positive for *H. pylori* giving a prevalence of 60.0%. Age group 31-40 years had 20.0% prevalence; while11-20 age group had 4%. Participants who ate out daily (47%) were higher than those who ate out occasionally (9.0%); with prevalence of 30.0% and 4.0% respectively. Infection was significantly higher among those who drank borehole (tap) water (27.0%) than those who drank table water (0.0%) (P≤0.001). Traders who stayed away from home (51.0%) had highest prevalence. The findings showed a high prevalence of H. pylori in Aba and the risk factors identified included unclean water sources, eating habits and occupation.

Keywords: *Helicobacter pylori*, prevalence, serology, Aba, Nigeria

INTRODUCTION

Helicobacter pylori (*H. Pylori*) are a gram-negative, spiral shaped, micro aerophilic, motile bacterium. It is endemic in Africa and Asia -the two continents contributing two thirds of the world's disease burden (Ahmad *et al*., 2018). It is one of the commonest bacterial infections worldwide and accepted as the cause of chronic active gastritis (Ehab *et* al., 2010). *H. Pylori* infection has been recognized as one of the most common chronic bacterial infections in humans and infecting more than half of the population of the world. It is a world-wide problem, but the prevalence varies from country to country and among population groups in same country. It causes a wide range of gastrointestinal disorders including gastritis, dyspepsia and gastric cancer (Olokoba *et al*; 2013, Ndububa et al, 2001). It is estimated to affect half of the adult population worldwide (Ahmad *et al*, 2018). The overall prevalence is high in developing countries (Naous *et al*., 2007). *H. Pylori* infection is acquired in early childhood and becomes a chronic infection if left untreated (Cosme, 2013). The majority of the infected people remain asymptomatic and only small portions develop illness, usually in adulthood.

Pylori cause upper gastro intestinal disease such as gastritis, peptic ulcer disease and also increase in the risk of gastric cancer (Amal *et al.*, 2007, Wasiam *et al.*, 2007). The bacteria are most commonly found in the gastrointestinal tract and its existence is associated with chronic gastritis, gastro-duodenal ulcer, gastric adenocarcinoma and Muscosa Associated Lymphatic Tissue (MALT) Lymphomas (Morris *et al*., 1991, Forman *et al*., 1990). Moreover, the World Health Organization (WHO) has included *H. Pylori* as a class I carcinogen due to its strong correlation with gastric cancer (Alvarado-Esquivel, 2013; IARC, 1994). Each

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year approximately one million people lose their lives due to *H. pylori* infection (Naous *et* al., 2007).

H. pylori are transmitted through person to person (oral-oral or fecal-oral), consumption of contaminated water and through breast feeding (Alaker *et al*.,2002). WHO estimates that approximately 50% of the world's population is infected with *H pylori* as high rates of *H pylori* are associated with low socioeconomic status and educational levels, poor housing and personal hygiene, overcrowding, unhygienic sources of drinking water and increasing age (Allaker *et al*., 2002].This may also be encouraged by poor environmental sanitation and fecal contamination of water source used for irrigation of vegetables in farms or domestic use. Jemikajah and Okogun (2014) and Etukudo *et al*., 2012) in separate studies showed that sourcing water from well and borehole confers a higher risk of *H.pylori* infection than pipe-borne water. Other studies by Bateson (1993) in Glasgow and Ogihara *et al*. (2000) showed that there is increased prevalence of *H. Pylori* in subjects who smoked cigarettes than in those who never smoked.

In developing countries, 70-90% of the population harbour *H. Pylori* which is mostly acquired during childhood while in the developed countries, the prevalence is lower ranging from 30%-40% (Ahmad *et al.*,2018, Saad and Chey, 2008). Studies from Egypt by El Dine *et al.*(2008) reported a prevalence rate of 91.7%, 97% in Gambia (Secka *et al.*,2011), and 75.4% in Ghana (Baako and Darko, 1996). Studies from many Nigerian cities reported similar prevalence rate of 81% in Kano (Bashir and Ali, 2009), 87% in Jos (Malu *et al*., 2000), and 73% in Ile-Ife (Aboderin *et al*.2007). Also similar prevalence rates were reported in Asia, 92% in Bangladesh (Ahmad *et al.*, 1997), and 62% in China (Shi *et al*., 2008).

Early detection and eradication of the organism can lead to long term healing of all *H pylori* related infection (Cardaropoli *et* al., 2014). Risk factors for H pylori infection include low family income, educational levels, low socioeconomic status, living in crowded homes, use of contaminated source of drinking water and lifestyle habit such as smoking and alcohol consumption. Improvement in living conditions as well as balance diet and avoidance of overcrowding play major roles in prevention of H. pylori infection (Leonardo *et al.*,2014). A good understanding of the risk factors for acquiring *H pylori* infection in Aba, Nigeria is therefore critical if we must reduce the prevalence and burden of the diseases caused by the infection.

Our study therefore, aims to determine the prevalence of *H. Pylori* infection and its associated risk factors among outpatients with gastro intestinal tract disorders in ABSUTH, Aba where no such studies have been carried out.

MATERIALS AND METHODS

Study Area/Setting: This study was carried out amongst out-patients attending Abia State University Teaching Hospital (ABSUTH), Aba between 1st July 2018 and 31st September, 2018. Serology tests were done at the microbiology laboratory of the hospital.

Ethical Consideration: Ethical approval was obtained from ethical committee of Abia State University Teaching Hospital, Aba, as documented.

Inclusion criteria: The inclusion criteria are patients with gastrointestinal tract disorder and who have not taken any drug for treatment. Patients who are on medication for any form of gastrointestinal tract disturbances were excluded from the study.

Data Collection: Data was collected from the self-administered questionnaires given to the outpatients with gastro intestinal tract disorder in ABSUTH. Informed consent was sought from the participants themselves. Demographic variables collected included age, sex, marital status, educational level, occupation and other relevant clinical data such as history of gastrointestinal illness, source of drinking water, habits of hand wash before meals and after using the toilet.

Sample Collection and Analysis: Two (2ml) millilitre of venous blood was collected from each patient and put into a clean, dry, sterile test tube without anticoagulant. After clotting and retraction, it was centrifuged at 3000rpm for 5 minutes. The resulting serum was

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removed and 2 drops introduced into the specimen well (S) of the test device for *H. Pylori* antibody which is visible with the appearance of two district red lines for the positive result and a single red line for the negative result.

Statistical Analysis: Data analysis was done using statistical package for social sciences (SPSS) version 16. Comparison of mean was done using the student t test. The level of statistical significance was taken as $p \leq 0.05$.

RESULTS

Out of 100 subjects that participated in this study, 70 (70.0%) were females and 30 (30%) were males. *H. Pylori* infection was higher in females (43.0%) than males (17.0%) (Table 1).

Table 1: Sex distribution of *H. Pylori* among patients.

Sex	No Examined	No Positive for H. pylori	Percentage Positive (%) For H. pylori
Male	30	17	17%
Female	70	43	43%
Total	100	60	60.0%

The age group of the subjects ranged from 10-85 years giving a mean age of 36 ± 21.1 years. Age group 31-40 years had the highest number of subjects (26.0%), followed by age group 11-20 years (16.0%). Highest prevalence of *H. Pylori* was 20% and was seen in the 31-40 age-group, while the least prevalence (4.0%) was seen in the 11-20 group as shown in Table 2.

The number of subjects who ate out on a daily basis was higher (47%) when compared to the number who ate out occasionally (9.0%). Consequently the prevalence of *H. Pylori* was higher among subjects who ate out (30%) when compared with number that ate out occasionally (4.0%) (Table 3).

Among the subjects, the number who drank tap water (bore hole) was the highest (44.0%), closely followed by subjects who drank sachet water (39.0%) while the least (1.0%) are those who drank water from the stream. The prevalence of *H. Pylori* was highest among those who drank bore hole (tap water) (27.0%), followed by those who drank sachet water (23.0%) as shown in table 4.

Table 2: Age distribution of H. pylori among patients

Age groups	No Examined	No. Positive for H. pylori	Percentage Positive for H. pylori (%)
11-20	6	4	4.0
21-30	16	6	6.0
31-40	26	20	20.0
41-50	13	9	9.0
51-60	9	4	4.0
61-70	14	7	7.0
71-80	7	6	6.0
> 80	9	4	4.0
Total	100	60	60%

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Table 3: Distribution of H pylori among subjects based on their eating habits

No of times	No positive	Frequency	Percentage (%)	Cumulative percent %
Daily	30	47	47.0	47.0
Weekly	18	30	30.0	77.0
Monthly	8	14	14.0	91.0
Occasionally	4	9	9.0	100.0
Total	60	100	100.0	

Table 4: Distribution of H. pylori among subjects based on their source of drinking water.

Source of Drinking Water	No Positive	Frequency	Percentage
Stream	1	1	1.0
Tap water (borehole)	27	44	44.0
Sachet water	23	39	39.0
Table water	0	5	5.0
Sachet and tap water	9	11	11.0
Total	60	100	100.0

Amongst the subjects, traders were most predominant (51.0%). The prevalence of *H. pylori* was also predominant among traders (25.0%) followed by bus drivers (15.0%) and students (10.0%) as shown in Table 5.

Table 5: Distribution of H. pylori among subjects based on their occupation

Occupation	No position	Frequent	Percentage (%)
Teacher	6	7	7.0
Trader	25	51	51.0
Student	10	15	15.0
Engineer	1	1	1.0
Bus driver	15	22	22.0
Banker	3	4	4.0
Total	60	100	100.00

The prevalence of *H. Pylori* among subjects based on occupation and eating habits showed that traders (29.0%) and bus drivers (8.0%) ate out more frequently. This may have contributed to increased prevalence of H. pylori among them. Table 6 summarizes the prevalence of *H. Pylori* among subjects based on their occupation and eating habits.

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Table 6: No of subjects/Occupation

Who ate out	Teacher	Trader	Student	Engineer	Bus driver	Banker	Total l
Daily	4	29	4	1	8	1	47
Weekly	2	15	4	0	8	1	30
Monthly	1	5	3	0	5	0	14
Occasionally	0	2	4	0	1	2	9
Total	7	51	15	1	22	4	100

DISCUSSION

Helicobacter pylori are human associated bacteria which cause chronic infection in the stomach and duodenum, including peptic ulcer. The general prevalence of *H pylori* in this study was 60% using serology method. This prevalence is consistent with the *H. Pylor i* prevalence rates as reported in other Nigerian studies. In a study at Gombe (Mustapha *et al*.,2011), H pylori prevalence was found to be 77.1% while Ndububa *et al.*(2001) in Ile lfe reported prevalence rates of 73%. Nigerian prevalence rates are similar to those reported in studies in South Africa 66% (Kidd *et al.,* 1999) and Kenya 94% (Kimanga *et al.,* 2010). Woodward *et al*., 2000) in a study in Glasgow, UK reported a prevalence of 66% which they noted was more typical of prevalence in developing countries. The difference in prevalence of *H. Pylori* infection may be attributed to differences in study area, subjects, sample size, personal hygienic condition and variations in the socio economic status of the study subjects as well as differences in the sensitivity and specificity of testing methods.

The sex specific prevalence in females was 43.0% which was significantly high compared to males 17.0%. The 17 males that tested positive represents 56.7% of the male population while the 43 females that tested positive represents 61.4% of female.This result is similar to a study done at Warri, Nigeria which reported a higher H. pylori prevalence in females than in males (Jemikajah and Okogun 2014). In contrast, studies from other centres reported a higher H. pylori prevalence in males than females. Studies in Kano, Nigeria reported a higher, prevalence of H. pylori in males (82.4%) than females (81.6%). Similarly, Omosor *et al*, (2017) revealed that the prevalence of H pylori infection was also higher in males (55%) than females (51.4%). Woodward *et al*, (2000) also reported a higher prevalence of H. pylori in men than in women. Ford and Axon noted that the male gender is a risk factor for H. pylori infection. The studies at Kerala, India, showed no statistical significant difference in sex distribution of H. pylori (Adlekha *et al*, 2013).These variations in prevalence between males and females may be due to differences in lifestyle, exposure to potential environmental sources and habits such as smoking and alcohol consumption.

The prevalence of H. pylori in this study was higher among subjects who ate out daily (30.0%) than in those who ate out occasionally (4.0%). This may be associated with poor sanitary measures employed in restaurants and other food handlers. This agrees with the study by Quaglia *et al*, (2008) which suggested ingestion as the most likely means of acquisition of this pathogen.

We found in our study, as seen in table 4, a higher prevalence of H. pylori infection among subjects who sourced their drinking water from bore hole, sachet water when compared to those who use table water ($p<0.001$). This may be due to poor sanitary conditions and non-compliance with quality control measures involved in setting up boreholes which is common in developing countries. A similar study in Nigeria showed that sourcing water from well and borehole confers a higher risk of H. pylori infection than pipe-borne or table water which is treated (Jemikajah and Okogun, 2014).

The prevalence of H. pylori infection in this study was also influenced by the occupation and eating habits of

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the subjects. Traders who leave their homes early in the morning and long distant bus drivers are forced to patronize road side food vendors and hawkers. This predisposes them to the pathogen with a higher infection rate seen among them.

Conclusion

This study showed that the prevalence of H. pylori infection is high among patients with gastro intestinal track disorder in Aba, Nigeria, and drinking borehole water, frequent eating of food outside homes, and varying occupations are strongly associated with increasing risk of H. pylori infections. Absolute prevention of complications and relief from the distressing abdominal symptoms can be achieved through early detection by conventional and affordable diagnostic methods and empirical treatment with anti H.pylori therapy.

Limitations of the study

Most patients refused taking the urease capsule for the urease breathe test. Also, invasive test methods which require endoscopic gastro-duodenal biopsy samples could not be carried out for reasons of cost.

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AUTHOR'S CONTRIBUTIONS

Ngwogu Ada C is the principal investigator involved in the design of the study. Obodo Afoma O was involved in sample collection and screening while Ngwogu Kenneth O, analyzed and interpreted data.

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