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Research Article,

Prevalence of Helicobacter Pylori Antibody among Outpatients of Federal Medical Center, Yenagoa, Niger Delta Region of Nigeria

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Abstract:

Helicobacter Pylori is the most common chronic bacterial infection (acquired early childhood) in humans affecting 50% of the world population and much attention has not been paid to this. This study was carried out between February and October 2019 to test for the presence of *Helicobacter Pylori* antibody among asymptomatic individuals attending Federal Medical Center, Yenagoa, Bayelsa State. A total of 200 {114(57%) males, 86(43%) females} blood samples were collected at ramdom into Ethylene diaminetetraacetic acid (EDTA) bottles and immediately transported to the laboratory for analysis using *Helicobacter pylori* Serology rapid blood test kit. Age was stratified to allow for comparison because the entire outcome was age dependent. Chi square analysis was conducted for the categorical variable. Findings showed that out of 200 samples examined, 88(44%) forty (40 (45%) males and 48(55%) females were positive to *Helicobacter pylori* infection while 112(56%) were negative. Females of age range 24 -33 had the highest prevalence of 24 (27%) while male of age group 14 to 23 had 21(24%); females of 34 to 44 was 16(18%); 54-63 had 4(05%) and the least was 44 to 53 years with prevalence of 3(03%). There was a significant difference across the age group and socio-demographic characteristic at p-value = 0.0001 < 0.05 and p-value =0.002068 < 0.05, p-value = 0.000916 <0.05 respectively. Observations showed the higher prevalence in females (53%) than their males (47%) counterparts; likewise the infected individuals host this organism ignorantly and are busy treating out of line. Study with more than one diagnostic technique is recommended to determine the presence of *Helicobacter pylori,* as rapid blood test is limited due to the presence of antibody in the serum for long after eradication. In conclusion, routine medical examination on *Helicobacter pylori* is encouraged among individuals in respective of age and status.

Keywords: *Helicobacter pylori* infection, Antibody testing, Age group, Blood test, Rapid Diagnostic test.

Introduction:

Helicobacter pylori (*H. pylori*) is a gram negative spiral shaped bacterium with five flagella; it is an old microorganism that has been in existence since 1982 after its discovery by Warren and Marshall. The organism is an etiological agent of many diseases ranging from Upper Gastrointestinal because of its the ability to invade the gastric mucosa and cause chronic active gastritis (inflammation in the stomach) where the organism is found under the mucus layer in the gastric pit placed beside gastric epithelial cells causing chronic active gastritis; this can lead to gastric ulcer and gastrointestinal tract (GIT) discomfort. Budzynski *et al*. (2014) stated that chronic *Helicobacter pylori* infection is known to disrupt gastric secretion and impair its motility; it can also extend to other systemic organs especially the lower GI tract and associated with the symptoms (abdominal pain or discomfort, etc.) of irritable bowels syndrome (IBS) as well as those (satiation, fullness, epigastric pain, etc.) of functional dyspepsia (FD) (Hirotsugu*et al*., 2017). Other diseases include Peptic ulcer, (PUD), Gastric carcinoma; Gastric Mucosa Associated Lymphoid tissue (MALT) Lymphoma. The occurrence of *Helicobacter pylori* infection is worldwide with variations among countries and its building capacity is attributed to age, class, socioeconomic and country of origin Ayana *et al*., 2014;

Moayyedi*et al*., 2017. Despite the discovery of *Helicobacter pylori* and understanding of its etiology, important data generated from the organism investigations with respect to pathophysiology in its host body has not been interpreted into clinical practice for proper comprehension and documentation. Many individuals harbor this microorganism ignorantly and are busy treating malaria and other irrelevant infections without having the knowledge of their actual problem especially in the developing countries such as Nigeria. A specific chemotherapeutic agent has not been discovered to ascertain the treatment of *Helicobacter pylori* infection; hence the naïve carriers suffer excruciating pain as a result of its presence especially in Yenagoa metropolis, Nigeria. *Helicobacter pylori* is in existence globally infecting individuals, but the level of awareness, knowledge and treatment differ among countries. There is a greater awareness in developed countries than in developing countries. The report on its prevalence in the civilized countries expressed 20 to 50% in their adult population, but higher (about 90%) than this figure in the developing countries; Moayyedi *et al., (*2017); IARC (1994). higher prevalence exists in rural area regions of low socioeconomic and poor sanitary conditions when compare to urban areas. It was also discovered that *Helicobacter pylori i*nfection is associated with childhood, though the acquisition rate has been controlled by good sanitary condition and chemotherapeutic agents' application. Although the prevalence of *H. pylori* in the Western world is decreasing, gastric colonization by this organism remains widespread in the developing world. Infection with *H. pylori* can be diagnosed by a variety of tests and can often be successfully treated with antibiotics. Unfortunately, the increase in antibiotic resistance is starting to affect the efficacy of treatment, and, in spite of the impact of this organism, preventive vaccination strategies still do not exist. A better understanding of *H. pylori* persistence and pathogenesis is thus mandatory to aid the development of novel intervention and prevention strategies. This study is carried out to evaluate the presence of *Helicobacter pylori* among symptomatic and non symptomatic subjects in Amasoma community and Yenagoa metropolis, Bayelsa state, Nigeria. The study also aimed at determining the association of *H. pylori* infection on the level of other clinical condition. Since it is biologically plausible this infection may affect other body physiology. The studies that have been done on the effect of the infection on other clinical did not compare among groups of disease with and without *H. pylori* infection. In this study, anthropometric parameters of patients with certain clinical state were compared with those of other clinical state. Objectively, the test for *H. Pylori* infection across different clinical conditions at Federal Medical Center Yenagoa and Asymptomatic subjects in Amassoma community was carried out and compared the differences in the statistical significance across different age group, social demographic characteristic of the subjects with positive blood test to that of negative.

Materials and Method:

Study Area

This study samples (venous blood) were collected from patients in the Federal Medical Centre, Yenagoa, Bayelsa State. A 1000 bedded- hospital located at the heart of Yenagoa, the state capital of Bayelsa state. It is the only Federal Medical Centre in this state where individuals from all communities in Yenagoa metropolis attend for treatment.

Ethical Approval

Ethical Approval was sought for and received from the ethical committee of the study hospital. Informed consent was obtained from the patients.

Sample Size

The sample size was determined using Taro Yemane's formulae

$$n = \frac{N}{1+N(\alpha^2)}$$

Where, n= required sample size
N= population size
α= level of significance at 0.05 or 0.10

In a population size of 400, the sample size required is
N=400 and α= 0.05;

$$n = \frac{400}{1+400(0.05^2)}$$

n= 200

Study Sample Procedure

Verbal consent was obtained from the subject who

met the eligibility criteria after the study procedure was explained to them. Recruitment of the subject into the study was by consecutive sampling with those whose blood test was positive as cases and those whose blood test was negative as controls.

Sample collection

Three milliliter (3ml) of venous blood was collected from individuals and kept in a 5ml syringe for clotting and settlement. A total of 200 blood samples were collected.

Sample Analysis

***Helicobacter pylori* Rapid Blood Test Procedure**

Analysis of the sample was doneat Niger Delta University Medical Microbiology department. The venous blood sample collected from the study subjects was taken to Niger Delta University Medical Microbiology laboratory within two hours of collection and the *H. Pylori* rapid blood test was carried out on them immediately. The one step *H. pylori* test kit is a test cassette that contain colloidal gold coupled with *H. pylori* antigens, and 2 nitrocellulose membrane containing a test line (T line) and a control line (C line) Coupled to red colored colloid gold and a sample bottle that contains 1 milliliter of a buffer solution. The T line is coated with *H. pylori* antigens, and the C line is coated with goat anti-*H. pylori* antibody. The antigens used in this device are from *H. pylori* cell lysate. The fresh blood was centrifuged and an aliquot of the serum was added to the sample well of the test cassette. The results were read within 15 minutes and recorded.

Biodata Collection (Age, Sex, and Occupation)

Biodatta was collected on *H pylori* test outcome using the rapid blood test kit. Records of associated symptoms were also obtained during blood collection.

Results:

Figure 1.0 depicts the pie chart of the number of positive and negative subjects to *Helicobacter pylori* infection

Table 1.0 shows baseline characteristic of enrolled participant and *H. pylori* results

Table 2.0 show the distribution of participant according to their age with their *H. pylori* outcome

Table 3.0 show the relationship between socio-demographic characteristic and *H. pylori* result

Figure 2.0 show positive and negative test result. The double line indicates positive reaction and the single line indicate negative reaction.

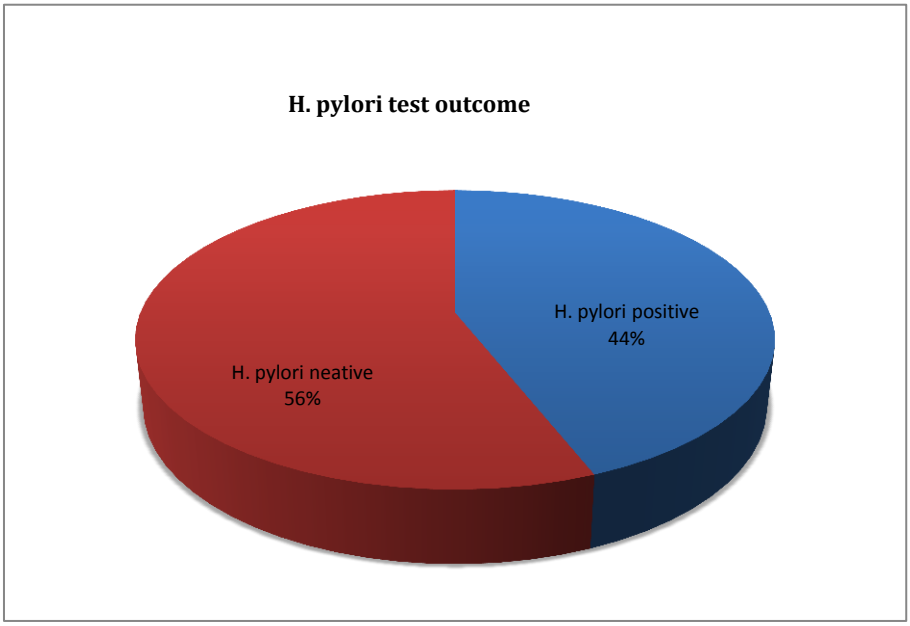

Figure1: Depicting the pie chart of the number of positive and negative to *Helicobacter pylori* infection
Based on the findings this figure shows percentage prevalence of 44 among the study subjects to *Helicobacter pylori*

Table1: Baseline Characteristics of Enrolled Participants and *H. pylori* results

Age in years	%	Gender		*H. pylori* negative n= 112	*H. pylori* positive n= 88
14-23	34	M	57	35	21
		F	11	4	8
		Total	**68**	**39**	**29**
24-33	38	M	36	32	4
		F	40	16	24
		Total	**76**	**48**	**28**
34-43	14	M	13	4	8
		F	15	0	16
		Total	**28**	**4**	**24**
44-53	6	M	4	1	3
		F	8	8	0
		Total	**12**	**9**	**3**
54-63	6	M	4	0	4
		F	8	8	0
		Total	**12**	**8**	4
64-73	2	M	0	0	0
		F	4	4	0
		Total	**4**	**4**	**0**

Table2: Relationship between age and *H. pylori* result

Variable	*H. pylori* outcome		Total	X^2 statistics	p- value
Age in years	**Positive (%)**	**Negative (%)**			
14-23	29 (42.6)	39 (57.4)	68	27.10	0.0001
24-33	28 (36.8)	48 (63.2)	76		
34-43	24 (85.7)	4 (14.3)	28		
44-53	3 (25)	9 (75)	12		
54-63	4 (33.3)	8 (66.7)	12		
64-73	0(0)	4 (100)	4		

X^2= 27.10, P= 0.0001 (P<0.05: highly significant) N=200

Table3: Relationship between socio –demographic characteristic and *H. pylori* test outcome

Variables	*H. pylori* outcome		Total	X^2 statistic	p- value
	Negative	**Positive**			
Gender					
Male	74	39	113	9.488179	0.002068
Female	38	49	87		
Marital status					
Married	36	22	58	13.99099	0.000916
Single	69	44	113		
Separated	7	22	29		

Discussion:

This study showed higher frequency of specimen distribution among the male subjects 113 (56.5%) and the female participants 87 (44.5%) with a male female ratio of 1.9 to 1.6 and age range from 14 to 73 ages, this is the opposite of the participants in the work done by Jemilohun *et al*., 2010 in University of Ibadan Teaching Hospital where they recruited 39 (45.3%) males and 47 (54.7%) females. Out of two hundred (200) subjects examined, eighty eight (88, 44%) were positive to *Helicobacter pylori* while one hundred and twelve (112, 56%) tested negative. This finding is lower than the result (73%) of Ndububa*et al.*, 2012 and 94.5% by Jemilohun*et al.,* (2010) from West and South Nigeria respectively, but higher than the result (30%) of Parkinso *et al*. (2000) in Europe; Harvey *et al*. (2010) in United Kingdom (27.4%), Moayyedi *et al*. (2017) in United State of America (35%), in Sweden (26.2%) and New Zealand (24%) by Hooi *et al*., 2017. This result is in agreement with Ayodele (2018) with lower (35%) prevalence rate, and higher prevalence (61.5%) ratio in women, whereas it contradicts the study published by Jemilohun *et al.* (2010) in South-West Nigeria, where *H. pylori* infection was observed in 64% of the subjects. This view was consistent with the work done by Mwangi *et al*., 2020 which reported 40.9%. Stratification of age in years was done to allow comparison between different age group because the dependent variables were all age dependent. The age groups were 14-23, 24-33, 34-43, 44-53, 54-63 and 64-73 years. As illustrated in table 1.0, (38%) of the subjects were age of 24-33 years with the least number of 54-63 and 64-73 (4%) each. 114 (57%) of the participant were males with 86 (43%) being female. There were more female than male in all the age groups except in 14 to 23 years where males exceeded female, hence the numbers in the positive and negative groups were comparable. Chi square statistics performed to access the effect of age on *H. pylori* outcome showed statistical significance at X^2= 27.10, P= 0.0001 (P<0.05: significant).

This study showed that 44.5% of the female examined had prevalence (24.5%) higher than that of their male counterparts (19.5%). The general prevalence of *H. pylori* among the study population was (44%). Although this incidence is lower than most reported prevalence of *H. pylori* in this region, their comparison may be limited because of the differences in the methodology adopted as most of them used stool antigen method. Thus this is important as there is a lower awareness about the infection in this part of the globe, more critical is the fact that *H. pylori* breath test is less commonly used for detection.

Chi square test carried out on the effect of socio-demographic characteristic on their *H. pylori* result outcome showed statistical significance on both their gender and marital status. The chi square result for their gender is X^2=9.488179 P=0.002068 (P<0.05, statistically significant), whereas, X^2=13.99099, P=0.000916 (P<0.05, statistically significant).

Figure2: shows positive and negative test result, double line indicating positive reaction and single line indicating a negative reaction

Associated morbid conditions and the risk factors were recorded during questioning, out of the 88 infected subjects, 37(42.05%) of them manifested several symptoms such as heart burn, stomach upset, constipation, nausea and vomiting, 51(57.95%) did not show any sign of associated symptoms. The presenting symptoms of the confirmed cases were heart burn, indigestion and gastroeosophageal reflux disease others complained of asthma, stomach ache, tiredness, periodontium of which association with *H. pylori* infection is uncertain.

Thus, this is important as there is a low awareness about the infection in this part of Nigeria. More critical is the fact that, *H. pylori* breath test is less commonly used for detection of the infection in this region which is a measure of the concentration of the labeled carbon present in the stomach of patients as it is high in breath only when urease is

present in the stomach, a unique feature peculiar to *H. pylori* infection. This study has a major limitation because it was conducted in a single hospital setting whereas community settings could have given a more encompassing inference and as such, may not be a true representation of the prevalence of *H. pylori* among persons with symptoms relating to peptic ulcer disease in the larger society of the South-South region of Nigeria. Therefore, there is the need to create awareness for the disease; especially now that more studies have indicated a high incidence of *H. pylori* infection in the Nigeria, with major considerations given to the food and public health hygiene of the people without neglecting hand washing practices as a key mode of preventing pathogen transfer. Also, critical appraisal should be carried out on the possible sources of the pathogen and its possible modes of infection in order to curb its wide spread and reduce its impact on the public health of general population. Therefore it is imperative for increased grants/sponsorships for research to be carried out in this region as there are limited data on this infection in Bayelsa state.

Conclusion:

This study showed that the prevalence of *H. pylori* among symptomatic patients using the urease based method is high in the South-South of Nigeria. It also suggests that there is no significant difference in the age distribution of *H. pylori* infection among the study population in the south-south of Nigeria. Of note is the high prevalence of *H. pylori* among the large population of people under the main work force age group. Thus, it is imperative for all symptomatic patients to be tested and treated for *H. pylori* in Niger Delta region of Nigeria.

Recommendation

Studies with more than one diagnostic technique are recommended to determine the presence of *H. pyori* as rapid blood test is limited due to the presence of antibody in the serum for long after eradication.

Competing Interest

The authors declare no competing interests

Author's Contribution

Olorode O.A. designs, collect and analyze the data, also participated in the write up; Ofonime M.O Collects and analyze the data generated; William designs, collect the data and participated in the write up.

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