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Prevalence of *Helicobacter pylori* among Peptic Ulcer Patients Attending National Hospital Abuja

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Abstract **Original Research Article**

Transmission of *Helicobacter pylori* is largely by the fecal-oral routes and considered as one of the major causes of peptic ulcer disease. Lack of proper sanitation, safe drinking water, and of basic hygiene, as well as poor diets and overcrowding, all play roles in determining the overall prevalence of the infection amongst patients attending National Hospital, Abuja. With their consent a total of 100 fecal samples were collected from patients and they were required to fill the questionnaire. Each fecal sample was tested using a *Helicobacter pylori* Ag rapid test cassette. Out of the 100 patients screened, 16 were found positive with the prevalence of 16%. The male patients showed a higher prevalence with 20.5% in contrast to the female prevalence of 13.6%. This data shows that the relatively low prevalence of this infection is as a result of the good living conditions and feeding habits of the patients.

Keywords: Peptic Ulcer Disease, *Helicobacter pylori,* Fecal –Oral Route, Patients.

INTRODUCTION

The *Helicobacter pylori* is more common in developing countries such as Nigeria and its prevalence increases with age from 20% among teenagers to 50-60% of subjects in the 6th and 7th decades of life [1]. Infection rate of children in developing nations is higher than in industrialized nations, probably due to poor sanitary conditions, perhaps combined with lower antibiotics usage for unrelated pathologies. 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% between 18 and 30 years [2].

The higher prevalence among the elderly reflects higher infection rates in the past when the individuals were children rather than more recent infection at a later age of the individual [3]. Peptic ulcer disease may or may not have symptoms. *Helicobacter pylori* causes' peptic ulcer disease at first by infection, then it causes gastritis in the antral region and then there is a defective inhibition of gastrin release and acid secretion. The gastric acid is then hyper secreted and the duodenal acid load is increased. This is followed by metaplasia in the duodenal bulb, thus duodenal *Helicobacter pylori* infection is caused [4]. Peptic ulcers can heal spontaneously and may occur intermittently and can also have a serious fate. The complications might be life threatening without any warning signs. This is most common in elderly patients on non-steroidal anti-inflammatory drugs (NSAIDs). *Helicobacter pylori* is a Gram negative, micro-aerophilic spiral shaped, flagellated, bacillus which colonize the mucus layer of the gastric epithelium and it causes more than 90% of duodenal ulcers and up to 80% of gastric ulcers [5]. *Helicobacter pylori* are associated with diffuse superficial gastritis and is one of the dominant causal factors for duodenal ulcer disease. The organism tests positive for oxidase, catalase and urease. *Helicobacter pylori* infection is common worldwide with prevalence rates ranging 30 to 40% in the United States, 80 to 90% in South America and 70 to 90% in Africa [6]. 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 *Helicobacter pylori* and described its association with histologic gastritis and subsequent peptic ulcer disease [7]. Peptic ulcer disease also known as PUD is one of the most common ulcer which is a sore on the inner lining of the stomach or duodenum; the first part of the small intestine. Less

commonly, a peptic ulcer may develop just above the stomach in the oesophagus. Peptic ulcers can be broadly classified into gastric or stomach ulcer and duodenal ulcer. Gastric ulcers occur mainly in the elderly, on the lesser curve. Ulcers elsewhere are often malignant. Duodenal ulcers are four fold commoner than gastric ulcer. It is identified by the most common symptom i.e. the epigastric pain occurs typically before meals or at night which is relieved by eating or drinking milk [8]. Another type of peptic ulcer disease is the Idiopathic Peptic ulcer disease (IPUD) is defined as a peptic ulcer without definite causes such as *Helicobacter pylori* infection, non-steroidal anti-inflammatory drugs (NSAIDs) use or hypergastrinemia. Peptic ulcer disease is an important cause of morbidity and mortality throughout the world affecting the lives of millions of people in their everyday life. In the United States, approximately four million people have peptic ulcers (duodenal and gastric), and 350,000 new cases are diagnosed each year. Around 180,000 patients are hospitalized yearly, and about 5000 people die each year as a result of peptic ulcer disease. The lifetime likelihood of developing peptic ulcer is about 10% for males and 4% for females [9]. Complications of Peptic ulcer disease may include: internal bleeding, obstruction of food trying to leave the stomach, perforation and peritonitis. *Helicobacter pylori* cause chronic active, chronic persistent and atrophic gastritis in adults and children. Infected persons have a 2 to 6 fold increased risk of developing gastric cancer and mucosal associated-lymphoid-type (MALT) lymphoma compared with uninfected persons [10]. The genus *Helicobacter pylori* belongs to the subdivision of the *Proteobacteria*, order *Campylobacterales*, family *Helicobacteraceae.* This family also includes the genera *Wolinella, Flexispira, Sulfurimonas, Thiomicrospira*, and *Thiovulum*; the genus *Helicobacter* consists of over 20 recognized species, with many species awaiting formal rendition [11]. Members of the genus *Helicobacter* are all microaerophilic organisms and in most cases are catalase and oxidase positive, and many but not all species are also urease positive [12].

METHOD

A total of 100 samples were collected for this research. In the present study, adult patients with ulcer or suspected ulcer who were being managed in National hospital were analyzed. The sample collection included both male and female patients who were registered in the hospital microbiology department. Completely randomized enrollment and full consent of participants were sought before they participated in the study. The samples were screened for the presence of *Helicobacter pylori*. Stool samples were collected in sterile containers. Socio-demographic data were obtained through questionnaires. In this work, the Aria *H. pylori* Ag rapid test kit was used for the analysis; whose principle was based on lateral flow chromatographic immunoassay.

RESULT

A total of 100 patients were screened, of these; 16 were positive to *Helicobacter pylori* giving a prevalence rate of 16% (16/100). Table 3.1 shows the prevalence rate of *Helicobacter pylori* with respect to sex of the patients in the study population. The infection rate was highest among the females, 9 out of 66 (13.6%) tested positive for *Helicobacter pylori* in contrast to the infection rate among the males where 7 out of 34 (20.5%) tested positive to *Helicobacter pylori*. Table 3.2 shows the prevalence rate of *Helicobacter pylori* with respect to the different age ranges where patients in the age group 76-85 had the highest rate of prevalence of 30.8% while the age group 36-45 had the lowest rate of prevalence with 7.1%. Other age groups 15-25, 26-35, 46-55, 56-65 and 66-75 had the prevalence rates of 13.0%, 11.1%, and 18.2%, 27.3% and 10% respectively. Table 3.3 shows the prevalence rate of patients who previously had ulcer where patients in the age group 66-75 had the highest rate of prevalence with 80% while the age group 26-35 had the lowest rate of prevalence with 33.3%. Other age groups 15-25, 36-45, 46-55, 56-65, and 76-85 had the prevalence rates of 39.1%, 42.9%, 54.5%, and 69.2% respectively.

Table-3.1: Prevalence of *Helicobacter pylori* in relation to sex among patients attending National Hospital, Abuja

Sex	Number screened	Number positive	Number negative	Percentage ratio (%)
Male	34	7	27	20.5
Female	66	9	57	13.6
Total	100	16	84	

Table-3.2: Prevalence of *Helicobacter pylori* in relation to age among patients attending National Hospital, Abuja

Age (Ranges)	Number screened	Number positive	Number negative	Percentage ratio (%)
15-25	23	3	20	13.0
26-35	18	2	16	11.1
36-45	14	1	13	7.1
46-55	11	2	9	18.2
56-65	11	3	8	27.3
66-75	10	1	9	10
76-85	13	4	9	30.8

Total	100	16	84	

Table-3.3: Prevalence of patients who previously had ulcer

Age (Range)	Number screened	Number of yes	Number of no	Percentage ratio (%)
15-25	23	9	15	39.1
26-35	18	6	10	33.3
36-45	14	6	9	42.9
46-55	11	6	5	54.5
56-65	11	5	6	45.5
66-75	10	8	2	80
76-85	13	9	4	69.2
Total	100	49	51	

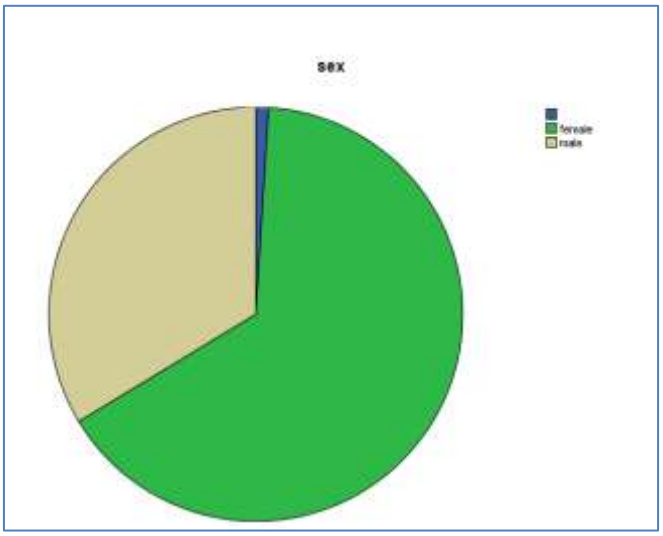

Fig-2: Prevalence of *Helicobacter pylori in* relation to sex among patients attending National Hospital, Abuja

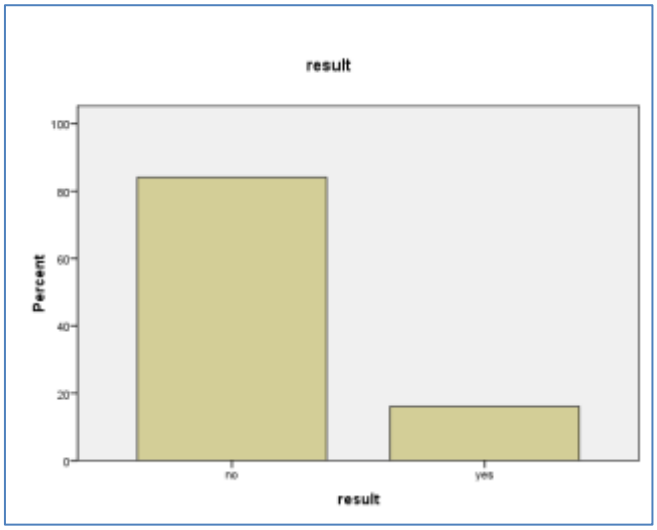

Fig-3: Prevalence of *Helicobacter pylori* in relation to test result among patients attending National Hospital, Abuja

DISCUSSION

The result of this study revealed that the faecal-prevalence rate of *Helicobacter pylori* among patients of National Hospital Abuja was 16%. The detection of *Helicobacter pylori* using antigen or PCR-based methods directly from clinical samples might be non-specific due to cross reactivity. These limitations could have affected estimates of the prevalence of *Helicobacter pylori* infection in previous studies. The result of this study was dissimilar to studies carried out in the Netherlands with low prevalence of 1.2%, and Canada with 7.1% [13]. Our result here, however, was lower to those obtained in other areas such as Asia; Bangladesh (>90%), India (88%), Japan (70%), the Middle East; Libya (94%), Saudi Arabia (80%) and Egypt (90%), and South America; Chile (70%), Brazil (82%) were positive for *Helicobacter pylori* [11] shows

a higher prevalence in contrast to this study. Also comparing this result to the works done in some parts of Africa, it was deduced that the result was lower; Ethiopia which had the prevalence of 96% [11]. Gambia with the prevalence of 80% and Ivory Coast with the prevalence of 65% (Holcombe 1992); Zimbabwe and Kenya showed a prevalence of 80% in both countries [13]. Our value was also lower than those obtained in other parts of Nigeria too. For instance, the work done by [62] in Kwara with a prevalence of 88%. This low prevalence might be due to the exposure of the patients to the relatively fair hygiene of their environment.

CONCLUSION

This work was done using the faecal method to check the prevalence rate peptic ulcer caused by *Helicobacter pylori* in patients attending National Hospital, Abuja, and from the screening carried out it was discovered that there is a relatively low prevalence (16%) of peptic ulcer caused by *Helicobacter pylori* within National Hospital, Abuja which may be attributed to the good sanitary living and good personal hygiene of the patients as well as regular checkups observed by patients. The low prevalence could also be related to the fact that other sources may cause infection that is; smoking, drinking of alcohol, Non-steroidal Anti Inflammatory drugs (NSAID), untreated stress, regular fasting, some host factors such as gene polymorphism and immune response.

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