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Document heading

# Seroprevalence of *Helicobacter pylori* infection among students of a Nigerian University

Ishaleku David\*, Ihiabe Hope A

Microbiology Unit, Department of Biological Sciences, Nasarawa State University, P. M. B. 1022, Keffi, Nigeria

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## ABSTRACT

**Objective:** To investigate the seroprevalence of *Helicobacter pylori* (*H. pylori*) infection among the undergraduate students of Nasarawa state University, Keffi, Nigeria. **Methods:** A total of 200 serum samples were collected from undergraduate students of Nasarawa State University, Keffi, and 100  $\mu$  L of each serum was aseptically transferred to the specimen well of an *H. pylori* antigen kit (Clinotech USA). The 2 distinctive red lines appearing in the control and test regions of the kit after 10 minufes indicated positive reaction. **Results:** Of the 200 students sampled, 108 (54%) were seropositive. Analysis of seroprevalence of *H. pylori* revealed the correlation between infection prevalence and age. The infection prevalence was 45.5% among students aged 18–20, rose to the peak of 85.7% adults aged 31–40, dropped to 66.7% among those 41–50 years old, and continuously went down to 28.6% in the 51-year-old and above populaion. There was a statistically significant difference (using Chi-square) with respects to gender, age and type of infection (symptomatic or asymptomatic seropositive infection)( $P < 0.05$ ). **Conclucions:** Community Health Personnel should be aware of this microorganism as a potential cause of illness in children. Furthermore, the mode of transmission and possible means of controlling the bacterial infection among students or a community is of public health concern and requires further study.

## 1. Introduction

*Helicobacter pylori* (*H. pylori*) is a helix, gram-negative, microaerophilic bacterium that causes a chronic low-level inflammation of the stomach lining and is linked to the development of duodenal and gastric ulcers and stomach cancer. More than 50% of the world's population have *H. pylori* in their upper gastrointestinal tract and over 80% of those are demonstrated with asymptomatic infection[1], making it the most widespread infection in the world[2]. *H. pylori* infection can cause gastric and peptic ulcer disease and is a cofactor in gastric cancer[3]. Seroepidemiologic studies have shown that 50% of adults in the developed countries and nearly 90% of adults in the developing countries are positive for serum antibodies against *H. pylori*[4]. Despite this high prevalence little is known about the exact route of transmission of this infection in our society[2]. Several conditions however, are known to be related to chronic *H. pylori* infection. Among these are chronic gastritis[5], peptic ulcer disease, primary gastric lymphoma and gastric adenocarcinoma[6].

This study aims to investigate the prevalence of *H. pylori* infection among the undergraduate students of Nasarawa State University, Keffi, Nigeria.

## 2. Materials and methods

### 2.1. Ethical issues

Approval for this study was obtained from the Ethical Committee on Infectious Disease of the Federal Medical Centre, Keffi, and also obtained from the Board and Management of the University Clinic as well as from the students. The approval included participants' anonymity, good laboratory practice/quality control. Besides, every finding would be processed with utmost confidentiality and for the purpose of this research only.

### 2.2. Samples collection

Blood samples in this study were collected from undergraduate students of Nasarawa State University Keffi who presented at the University Medical Center for medical treatment from 8:00 am–12:00 am. Individuals were required to do questionnaires to provide their basic information including their age and gender.

### 2.3. Serological assay

Blood samples collected from the 200 students were centrifuged to obtain the serum. 3 drops of the serum (approximately 100  $\mu$  L) was transferred by a sterile dispensable droppers each time to the wells of the test kit (*H. pylori* Antigen Kit–Clinotech, USA). Those sera that

\*Corresponding author: Ishaleku David, Microbiology Unit, Department of Biological Sciences, Nasarawa State University, P. M. B. 1022, Keffi, Nigeria.

E-mail: [ishalekudavid@rocketmail.com](mailto:ishalekudavid@rocketmail.com)

were not used were stored in the refrigerator. The test was conducted after 10 minutes. The appearance of 2 distinctive red lines on the control and the test regions of the kit represented positive reaction.

#### 2.4. Statistical analysis

The Chi-squares ( $\chi^2$ ) test analysis was used to compare the seroprevalence percentage of infection in different categories. Took  $P < 0.05$  as significant.

### 3. Results

Out of the 200 undergraduate students, 108 were *H. pylori* seropositive with seroprevalence rate as 54.0%. Among them, the infection rate among males was 51.9% (56/108) compared to 56.5% (52/92) among females. The statistical analysis also revealed a significant difference in *H. pylori* infection between males and females ( $P < 0.05$ ). The *H. pylori* infection rate among students was shown associated with age. Students group aged 31–40 had the highest rate (24/28, 85.7%) of *H. pylori* infection and aged 51 and above had the lowest rate (8/28, 28.6%). There were 20 seropositive cases aged from 18–20 years old (20/44, 45.5%), 40 aged from 21–30 years old (40/76, 52.6%), and 16 aged from 41–50 years old (16/24, 66.7%).

Of the 108 seropositive students, 36(33.3%) presented symptomatic infection among which the males occupied 42.9% while the females occupied 23.1%. On the other hand, among the 72 asymptomatic students observed in this study, females constituted 76.9% while males constituted 57.1%.

### 4. Discussion

More than 50% of the world population are infected by *H. pylori*, which makes it an infection of public health concern in the world though little is known about its prevalence[2]. The result of this study revealed that the seroprevalence rate of *H. pylori* among the undergraduate students of Nasarawa State University was 54%, which is consistent with Pounder's observation in some developing countries[7]. However this seroprevalence rate was less than that reported in Countries like Taiwan[4], and the Urban and Rural Vietnam[8]. This bacterial infection is acquired during childhood and its prevalence increases according to age and may exist in most, if not all of the patients' life[7].

The fact that females intend to present high prevalence rate of 56.5% as shown in this study may due to what Amini et al and Malaty had described[9,10]. The correlation between seroprevalence of *H. pylori* infection and age as shown in the study was due to continuously accumulating risk factors and other social activities such as bed sharing and density of living of the participants (students) which is also consistent with the observation made by Amini et al[9] that almost half of the children in South India acquire *H. pylori* early in life which increases slowly and steadily, with its peak in young adults, and afterwards slightly declines as age advances.

The fact that more symptomatic *H. pylori* infection are observed in males than in females probably due to other risk factors such as alcohol, stress and smoking activities of the males which aggravate the *H. pylori* infections as agreed by Gonz lez et al, Zhang et al and Malaty et al[3,6,11]. Compared with male group, females yield higher prevalence of asymptomatic *H. pylori* infection, which may due to their higher level of social activities among the females than

males as opined by Magalh es et al[2].

This study has shown a 54.0% seroprevalence of *H. pylori* infection among the undergraduate students of Nasarawa State University, Keffi. The high seroprevalence of this bacterial infection among students aged 31–40 (85.7%) indicates that the major public health problems of peptic ulcer disease and gastric cancer in the society will be difficult to be eradicated since this age group are engaged in high interpersonal social activities that enhance the transmission of the bacteria. Thus, Community Health Personnel should be aware of this microorganism as a potential cause of illness in children. They can play a role in promoting hygiene practices and educating families to reduce the risk of acquiring the bacteria during childhood. Furthermore, the mode of transmission and possible means of controlling the bacterial infection among students or a community is of public health concern and requires further study.

#### Conflict of interest statement

We declare that we have no conflict of interest.

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