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Chinedu Imo *

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Research Article

Prevalence of Helicobacter pylori Infection Among Members of Staff of Federal University Wukari, Nigeria.

Chinedu Imo*, Chioma Ibekwe and Bissong Joseph

Department of Biochemistry, Faculty of Pure and Applied Sciences, Federal University Wukari, Wukari, Nigeria.

***Corresponding Authors:** Dr. Chinedu Imo, Department of Biochemistry, Faculty of Pure and Applied Sciences, Federal University Wukari, Wukari, Nigeria.

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Abstract:

Helicobacter pylori (*H. pylori*) is a common type of bacteria that infects the stomach lining and the small intestine's first part. It is the most common cause of peptic ulcers, which are sores that form mainly in the stomach and upper part of the small intestine. *H. pylori* can also cause gastritis and increase the chance of developing stomach cancer. This study aimed to evaluate the prevalence of *Helicobacter pylori* infection among staff members of Federal University Wukari, Nigeria. A total of one hundred and twelve (112) staff members of Federal University Wukari, Taraba State, Nigeria volunteered for the testing and were used for this research. They include seventy-two (72) male and forty (40) female. They were selected at random. The detection of *H. pylori* in the volunteers' blood samples was carried out using a rapid, one-step test for qualitative detection of antibodies to *Helicobacter pylori* in whole blood, serum or plasma. The rapid diagnostic test kit was made in China and is a product of RapidLab Unique Global. The result showed there was a positive test result for *H. pylori* infection in twenty (20) male staff and a negative test result in fifty-two (52) male staff of Federal University Wukari, Nigeria out of the seventy-two (72) male staff tested. There was a positive test result for *H. pylori* infection in twelve (12) female staff and a negative test result in twenty-eight (28) female staff of Federal University Wukari, Nigeria out of the forty (40) female staff members tested. There was a positive test result for *H. pylori* infection in thirty-two (32) members of staff and a negative test result in eighty (80) members of staff of Federal University Wukari, Nigeria out of the one hundred and twelve (112) members of staff tested. Twenty-nine percent (29%) of staff members tested positive for H. pylori infection and seventy-one percent (71%) of staff members tested negative for *H. pylori* infection. This study concluded that among the one hundred and twelve (112) volunteered members of staff of Federal University Wukari, Nigeria, thirty-two (32) tested positive, while eighty (80) tested negative. The prevalence of *H. pylori* infection among the members staff of Federal University Wukari, Nigeria may be about 29%, while the infrequent rate among the members of staff may be about 71%.

Keywords: antibodies; gastritis; *helicobacter pylori*; infection; prevalence; ulcer

Introduction

Helicobacter pylori is a microaerophilic, Gram-negative, spiral-shaped bacterium that requires specific growth conditions [1]. It was first successfully isolated in 1983 from gastric mucosa biopsies of patients suffering from chronic antral gastritis [2]. *H. pylori* is closely associated with various gastrointestinal diseases, including gastritis, gastric ulcers, and gastric cancer [3]. The traditional treatment for *H. pylori* infection involves the use of proton pump inhibitors (PPIs) combined with two antibiotics and bismuth [4]. However, the rise in antibiotic resistance in recent years has led to a decline in the eradication rates of *H. pylori*. According to the World Health Organization (WHO), the rates of antibiotic resistance for clarithromycin and metronidazole have reached concerning levels, exceeding 15% [5].

Helicobacter pylori (*H. pylori*) is a common type of bacteria that infects the lining of the stomach and the first part of the small intestine. Most people infected with *H. pylori* do not experience any symptoms. However, in some individuals, the bacteria can lead to digestive issues. *H. pylori* is the most common cause of peptic ulcers, which are sores that primarily develop in the stomach and the upper part of the small intestine. Additionally, *H. pylori* can cause gastritis, which is the inflammation and irritation of the stomach lining. Without treatment, *H. pylori*-related gastritis can persist for a lifetime and increase the risk of developing stomach cancer. The global prevalence of *H. pylori* infection remains high, indicating the enduring presence of this pathogenic bacterium that is capable of infecting humans. *Helicobacter pylori* infection is highly prevalent in many countries, affecting nearly one-third of adults worldwide [5].

There are several methods for detecting the presence of *H. pylori*, each with its advantages, disadvantages, and limitations. Additionally, there are multiple transmission routes for *Helicobacter pylori*, which include: 1. Person-to-person transmission: This bacterium often spreads within

families and is especially likely to infect the elderly and adolescents. Occupational exposure, particularly for doctors and nurses in close contact with infected patients, may also increase the likelihood of transmission. 2. Animal and human transmission: Homeowners can contract *Helicobacter pylori* through close contact with their pets. 3. Foodborne infection: Fecal contamination is a significant cause of contamination in many drinking water sources. Cattle and sheep can become infected with *Helicobacter pylori* by drinking contaminated water, and their faeces can further contaminate lakes and rivers. *Helicobacter pylori* can survive in low-acid, low-temperature, and high-humidity environments, such as in chicken, raw vegetables, yoghurt, and other ready-to-eat foods. As a result, *Helicobacter pylori* can infect humans through both food and water [6].

H. pylori infection is a widespread health issue in Nigeria and around the world. Its prevalence is increasing, making it a significant public health concern. If left undiagnosed, the individual will not know if he/she is infected and may be at risk of its health implications. Therefore, it is important to detect and address this problem among members of the staff of Federal University Wukari, Nigeria.

Due to the challenges posed by the high incidence of diseases caused by microbial infections, such as *H. pylori* infection, it is crucial to regularly monitor the prevalence of *H. pylori* among staff members at Federal University Wukari, Nigeria. Testing for this bacterium can help determine whether *H. pylori* is responsible for gastritis or other conditions that lead to ongoing indigestion. If it is, treatment may be necessary to eradicate the bacteria, allowing the stomach lining to heal. The findings of this research will enable affected individuals to seek appropriate medical care and promote overall health. Therefore, this study aimed to gather information on the detection of *H. pylori* infection among the staff at Federal University Wukari, Nigeria. The results will indicate the prevalence of *H. pylori* infections among the staff and will assist government and health agencies in understanding the extent of these cases in the population. This information will be valuable in developing effective management and control strategies to combat *H. pylori* infection.

Materials and Methods

Study Area and Population

This project research study was conducted from September, 2024 to November, 2024 in Federal University Wukari, Taraba State, Nigeria. A total of one hundred and twelve (112) staff members of Federal University Wukari, Taraba State, Nigeria volunteered for the testing and were used for this research. They include seventy-two (72) male and forty (40) female. They were selected at random.

Materials Used

The following materials were used during the present study: Sterile wipe, Test device containing *H. pylori* antigen-coated particles and anti-human IgG coated on the membrane, Cotton wool, Sterile lancet, Blood specimens (from the volunteers), Reaction buffer, Disposable plastic pipette, Timer and Record sheet.

Kits for *H. pylori* Rapid Test

The detection of *H. pylori* in the volunteers' blood samples was carried out using a rapid, one-step test for qualitative detection of antibodies to *Helicobacter pylori* in whole blood, serum or plasma. The rapid diagnostic test kit was made in China and is a product of RapidLab Unique Global.

Principles of *H. pylori* As Test Device

The *Helicobacter pylori* one-step test device (designed for whole blood, serum, or plasma) is a qualitative immunoassay that uses a membrane strip to detect *H. pylori* antibodies. To perform the test, a blood specimen along with a buffer is added to the specimen well of the device. The specimen then migrates along the test strip through a chromatographic process and interacts with the reagents present. If *H. pylori* antibodies are present in the specimen, a coloured line will appear in the test line region, indicating a positive result. Conversely, if the specimen lacks *H. pylori* antibodies, no coloured line will appear in this region, indicating a negative result. To ensure the test has been conducted correctly, a coloured line will always appear in the control line region. This confirms that the appropriate volume of the specimen has been added and that the membrane is functioning properly.

Procedure for Detection of *H. pylori* Infection

The test device, specimen and reaction buffer were allowed to attain room temperature before testing. The pouch was brought to room temperature before opening it. The test device was removed from the sealed pouch and labelled with the staff identification number.

The test device was placed on a clean and level surface. Then, a finger of the staff was selected for puncture. The finger was cleaned with an alcohol swap and allowed to air-dry completely before puncturing the skin with a sterile lancet for the collection of blood samples. The hand of the staff was gently rubbed from the wrist to the finger selected to form a rounded drop of blood over the punctured site.

With the help of the disposable plastic pipette provided in the kit, two (2) drops of blood sample from the staff's punctured finger were aspirated and transferred immediately to the specimen well (S) of the test device.

One (1) drop of the reaction buffer was then added to the specimen well and the timer was started. The test result was read at 10 minutes and recorded.

Result Interpretation

Positive result: If two distinct red lines appear. One line should be in the control region (C) and another line should be in the test region (T). The intensity of the red colour in the test region (T) varies depending on the concentration of *H. pylori* antibodies present in the specimen. Therefore, any shade of red line in the test region (T) was considered positive.

Negative result: If one red line appears in the control line region (C) and no apparent red or pink line appears in the test line region (T).

Invalid result: Absence of colour at the control line (C) region, with or without a coloured line at the test regions indicates invalid results.

Results and discussion

The results are presented in the figures below.

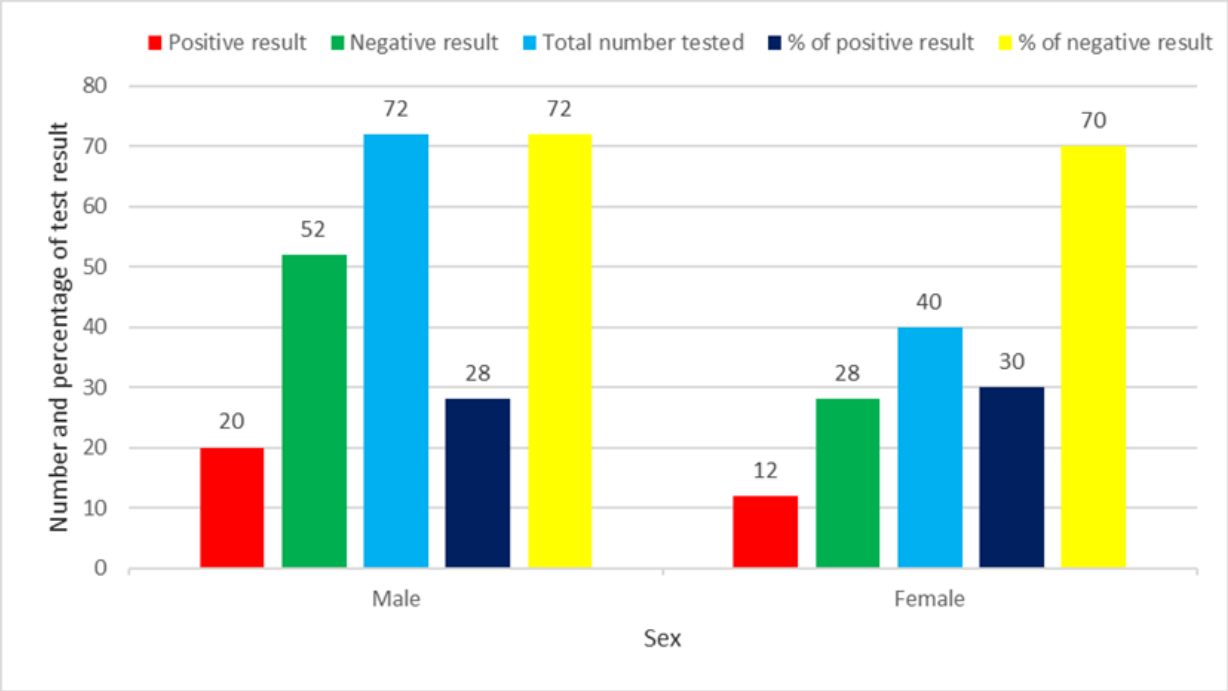

Figure 1: *Helicobacter pylori* Infection Test Result in Members of Staff of Federal University Wukari, Nigeria Based on Sex.

There was a positive test result for *H. pylori* infection in twenty (20) male staff and a negative test result in fifty-two (52) male staff of Federal University Wukari, Nigeria out of the seventy-two (72) male staff tested. There was a positive test result for *H. pylori* infection in twelve (12) female staff and a negative test result in twenty-eight (28) female staff of Federal University Wukari, Nigeria out of the forty (40) female staff members tested.

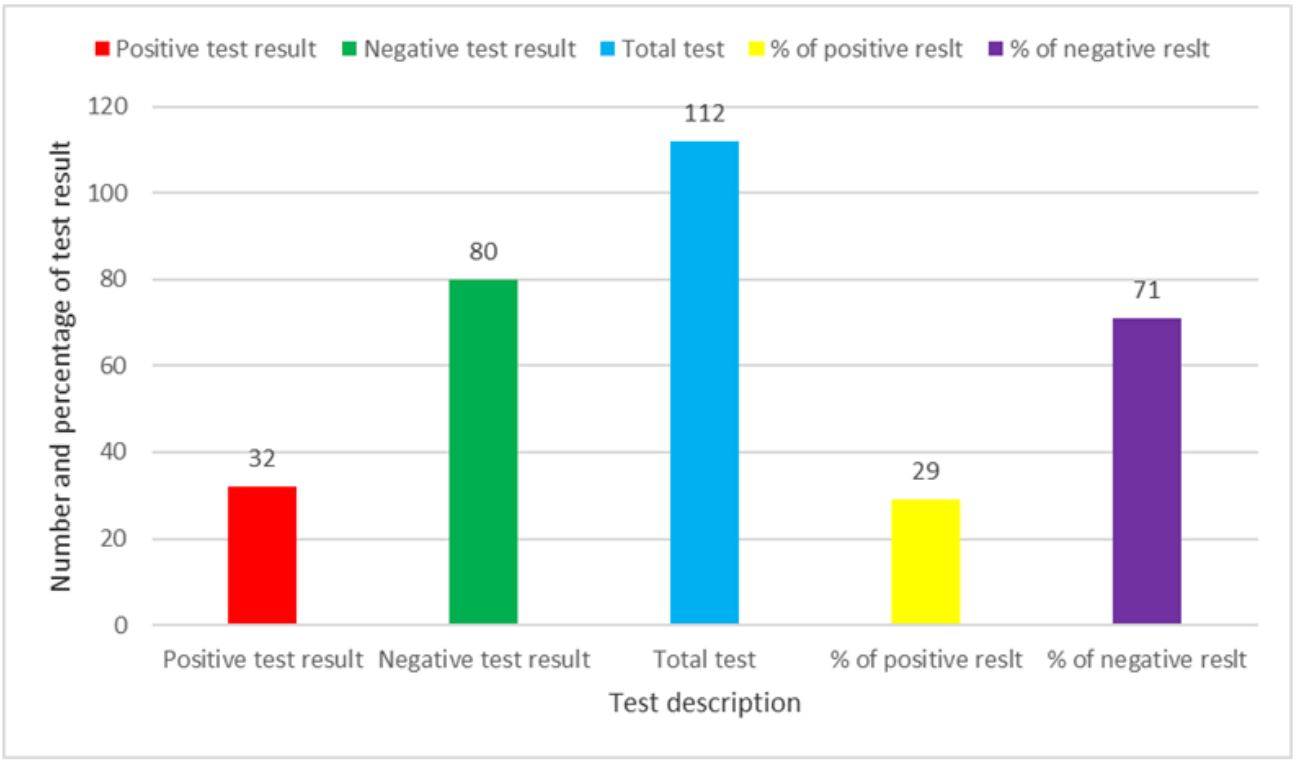

Figure 2: *Helicobacter pylori* Infection Test Result in Members of Staff of Federal University Wukari, Nigeria.

There was a positive test result for *H. pylori* infection in thirty-two (32) members of staff and a negative test result in eighty (80) members of staff of Federal University Wukari, Nigeria out of the one hundred and twelve (112) members of staff tested. Twenty-nine percent (29%) of staff members tested positive for H. pylori infection and seventy-one percent (71%) of staff members tested negative for *H. pylori* infection.

Discussion

The results of this study (figure 1) showed among the seventy-two male staff of Federal University Wukari, Nigeria, twenty (20) tested positive for *Helicobacter pylori* infection, while fifty-two (52) tested negative. This implies that about 28% of the male staff tested are affected by *H. pylori* infection, while 72% are not infected by *H. pylori*. The infection by *H. pylori* on the male staff members who tested positive may have occurred through any of the ways humans may contract *H. pylori*. It is also possible that some factors may have contributed to this prevalence rate recorded in this study. Such factors have been reported to include health conditions, socioeconomic status, race, and population density [7]. Apart from these factors mentioned, it is possible that chronic smoking, inadequate vitamin supplementation, excessive daily salt intake, and host factors can alter the acidic environment in the stomach and increase susceptibility to *H. pylori* infection among this group of people. The findings in this study suggest that the prevalence of *H. pylori* infection among male staff of Federal University Wukari, Nigeria may be about 28%, while the infrequent rate among the male staff may be about 72%. It will be necessary for the 52 male staff who tested negative to be encouraged to continue with good precautionary measures to avoid contracting *H. pylori*. Apart from isolation and certain medication, the food the members of staff consume may have a role in either preventing or eliminating *H. pylori* when infected by it. Phytotherapy and probiotic therapies have been reported to be useful dietary treatments. Mozaffarian *et al*. point out that food is medicine [8]. Foods related to plant extracts and probiotics are on the rise. These novel approaches are said to be effective in treating *H. pylori* infection. An enlightenment campaign among the members of staff is required to create more awareness of issues surrounding *H. pylori* infection and the possible disease conditions it may cause. This is because most of the members of staff tested reported not being knowledgeable about *H. pylori*. Some claimed not to have heard about *H. pylori* before this current study. This implies that they may not also be aware of the possible consequences of being infected by *H. pylori*, hence no knowledge of its preventive measures and management or treatment. The persistent colonization with more virulent strains of *H. pylori* has been reported to have the ability to induce several gastric and extra-gastric disorders [9]. Gastric disorders due to infection begin with gastritis, and inflammation of the stomach lining [10].

Among the 40 female members of staff tested, twelve (12) tested positive for *Helicobacter pylori* infection, while twenty-eight (28) tested negative. This implies that about 30% of the female members of staff tested are infected by *H. pylori*, while 70% are not infected by *H. pylori*. The findings in this study (Figure 1) suggest that the prevalence of *H. pylori* infection among the female staff of Federal University Wukari, Nigeria may be about 30%, while the infrequent rate among the female staff may be about 70%. The result of this study showed that more female staff were infected by *H. pylori* than the male. Based on the sex of the members of staff, the current findings showed that more female staff of Federal University Wukari, Nigeria may be infected by *H. pylori* than the male, and may be suffering the ill-health conditions that may arise from *H. pylori* infection than the male. However, the difference between the percentage of infected male staff to infected female staff is not very significant.

Among the one hundred and twelve (112) volunteered members of staff of Federal University Wukari, Nigeria that were tested in this study, thirty-two (32) tested positive, while eighty (80) tested negative. This result implies that 29% of the total members of staff tested were infected by *H. pylori*, while 71% were not infected by *H. pylori* (Figure 2). During the interaction with the members of staff tested, the majority of them were not aware of their status regarding *H. pylori* infection before the testing. This predicts poor regular check or testing of certain infection status such as *H. pylori*. This also suggests that there is generally a poor level of awareness of *H. pylori* infection among the members of staff. The prevalence of *H. pylori* in this study is lower than that reported in China by Ren *et al*. which was close to 45%, and it was estimated that nearly 600 million people in China were infected with *H. pylori* [11]. This study suggests an increase or improvement in educational or awareness programs on *H. pylori* infection among members of staff of the University. This is because awareness one one's status will help in suggesting possible treatment measures, thereby promoting the health status of the members of staff. This in turn will improve the efficiency of the staff members in the discharge of their duties. The prevalence of *H. pylori* is expected to be decreasing over time as people's living standards and eating habits improve [12].

Based on the members of staff tested, the findings of this research study (Figure 2) suggest that the prevalence of *H. pylori* infection among the members staff of Federal University Wukari, Nigeria may be about 29%, while the infrequent rate among the members of staff may be about 71%. This prevalence recorded in this study is lower than the figure reported in a different study by Sathianarayanan *et al*., according to them, in Africa, the infection rate of *H. pylori* is even as high as 90% in Libya, Egypt, Nigeria and other countries [13].

Conclusion

The findings in this study suggest that the prevalence of *H. pylori* infection among male staff of Federal University Wukari, Nigeria may be about 28%, while the infrequent rate among the male staff may be about 72%. Also, the prevalence of *H. pylori* infection among the female staff of Federal University Wukari, Nigeria may be about 30%, while the infrequent rate among the female staff may be about 70%. Among the one hundred and twelve (112) volunteered members of staff of Federal University Wukari, Nigeria that were tested in this study, thirty-two (32) tested positive, while eighty (80) tested negative. The prevalence of *H. pylori* infection among the members staff of Federal University Wukari, Nigeria may be about 29%, while the infrequent rate among the members of staff may be about 71%.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

i. Staff members are encouraged to regularly undergo medical checkups, even if they do not show any symptoms.

ii. It is essential for staff members to maintain a healthy lifestyle by consuming uncontaminated food and water to prevent *H. pylori* infection.

iii. Government agencies and health organizations should engage in ongoing awareness campaigns about *H. pylori* infections and related health issues.

iv. Further research is recommended to compare the findings of this study with a new study focused on the age of the staff members.

Conflict of Interest: The authors declare no conflict of interest.

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