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COMPARISON OF STOOL ANTIGEN AND BLOOD ANTIBODIES BY RAPID METHOD FOR DETECTION OF *HELICOBACTER PYLORI* INFECTION IN HOSTELIZED STUDENTS OF SARHAD UNIVERSITY OF SCIENCE AND INFORMATION TECHNOLOGY PESHAWAR

Burhan Ali[1], Farooq Zeb[2], Shah Hussain[3], Mr. Wahid Ullah[*4]

[1,2,3]*Student of Medical Laboratory Technology at Sarhad institute of Allied Health Sciences, SUIT Peshawar*
[*4]*Senior Lecturer at Sarhad institute of Allied Health Sciences, Sarhad University of Science and Information Technology Peshawar*

[1]malakburhan007@gmil.com, [2]farooqzebkhan5@gmail.com, [3]shahhussain316390@gmail.com, [*4]wahid.siahs@suit.edu.pk

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Corresponding Author: *
Mr. Wahid Ullah

Abstract

The colonization of the human stomach mucosa by Helicobacter pylori may cause chronic gastritis, which can develop into peptic ulcer disease. The goal of the current study was to look at H. pylori infections in students living in dorms. Students living in dorms provided blood samples for this reason. In terms of the incidence of H. pylori infection among students between the ages of 18 and 22, 14 (47%) of the total patients tested negative for the illness, while only 4 (13%) tested positive. In a similar vein, among students between the ages of 23 and 28, 16 (53%) were found to be negative and only 5 (17%) were found to be positive for H. pylori. Similarly, among patients between the ages of 18 and 22, 14 (47%) were found to be negative and only 13 (93%) were found to be positive for H. pylori infection. In a similar vein, only 12 (69%) of the 16 (53%) students in the age category of 23 to 28 years old tested positive for H. pylori. Out of the 30 individuals, 21 (70%) had negative findings and 9 (30%) had positive results for H. pylori infection. Nine (30%) of the thirty individuals tested positive for H. pylori infection. This investigation led us to the conclusion that the stool antigen test is more effective in identifying H. pylori infection.

INTRODUCTION

Helicobacter. One of the most prevalent long-term infections in humans, pylori is linked to stomach cancers as well as peptic ulcer disease and chronic gastritis. To identify H. pylori, a number of methods and tests have been developed. (Korkmaz *et al.*, 2022). Numerous benign and malignant gastroduodenal disorders, including noncardiac gastric cancer, peptic ulcers, atrophic gastritis, chronic active gastritis, and mucosa-associated lymphoid tissue lymphoma, have been connected to an infection with the human pathogen H. pylori. Additionally, H. pylori infections can harm the stomach's protective coatings, which makes it possible for the digestive juices to irritate the stomach lining and result in stomach ulcers and perforations. (Demiray *et al.*, 2019).

Early and prompt patient evaluation is required (Kim et al., 2022). Gastric biopsies are thought to provide conclusive evidence of H. pylori infection by bacterial culture. Because this quantity might not be present four weeks after eradication

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medication fails, the test is therefore less recommended for post-eradication follow-up. (Zhou *et al.*, 2022).

Infection rates vary from 10% to 80% across different nations, with an average of 50%. One of the most common chronic illnesses in humans is H. pylori infection of the digestive system. (Darma and others, 2019).the identification of a bacterium that lived in the human stomach mucosa and was later termed H. pylori. Peptic ulcer disease and chronic gastritis are caused by colonization of the human stomach mucosa. (Guo *et al.*, 2020).

non-invasive diagnostics that simply need to analyze excrement, blood, or breath. These include the urea breath test, serological approaches, and HpSA, a straightforward, practical, and helpful procedure that employs polyclonal or monoclonal antibody-based techniques6 and is advised for both diagnosis and eradication confirmation. Here, we looked at how HpSA may be used to diagnose H. pylori infection in individuals who have upper gastrointestinal problems (Khedmat H et al., 2018).Enzyme immunoassays (EIA) based on monoclonal or polyclonal antibodies are used to identify H. pylori in stool samples. Immunochromatographic assays (ICTs) for the identification of antigens in feces have recently been developed. ICT techniques are simple to use and enable findings to be obtained in a matter of minutes. (Andrews *et al.*, 2019).

According to Johannes et al. (2021), H. pylori infection has been found to be a significant risk factor for the development of peptic ulcer disease (PUD) and is likely the primary cause of recurrence in patients who have already received treatment for the condition.In underdeveloped nations, especially in low-socioeconomic areas, H. pylori infection is highly prevalent in newborns and children. Unless appropriate treatment is administered, H. pylori infections are nearly invariably acquired in early childhood and typically last a lifetime. Although H. pylori can cause ulcers in 10% to 15% of the world's population, up to 50% of people are infected. (Kato S, *et al.*, 2016).

Whether it is -based or -based, the urea breath test is considered the gold standard and is quite accurate. However, the usage of urea may be restricted due to radiation use. However, the analysis of the urea breath test needs costly equipment. (M. Hobsley *et al.*, 2021).

Using molecular techniques like PCR and fluorescence in situ hybridization (FISH), stomach tissue samples may be examined for the presence of H. pylori or antibiotic resistance. (Marshall BJ *et al.*, 2020).

METHODOLOGY

Study place:

This study was conducted at Sarhad University of Science and Information Technology Peshawar .

Study duration:

The study lasted for 4th months from February 2023 to July 2023.

Sample size:

A total of 30 subjects (Hostelized students) were selected for this study.

Selection criteria:

Sampling was done according to the following criteria.

Inclusion criteria

Only those students were included, who have positive *H. pylori* symptoms.

Exclusion criteria

Those students were excluded, who have symptoms other than *H. pylori*.

Sample collection processing:

After obtaining the subject's consent After isopropyl alcohol (70%) swabs were used to disinfect the skin, each participant had around 3 cc of venous blood extracted using a disposable plastic syringe. This sample was taken out of the gel tube. Blood was centrifuged for 15 minutes at about 3000 rpm after being allowed to clot in a plain tube for 10 minutes in the incubator. ICT was used to estimate the amount of anti-H. pylori IgG antibody in the serum using commercially

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available kits made by DRG International . The patient's stool was taken in order to use an ICT equipment to identify the H. pylori antigen. Stool samples are put to a support matrix after being diluted in certain diluents. The appearance of both a control line and a test line on the support matrix indicates a positive Helicobacter pylori infection test. Only the control line appeared, indicating a negative test. An incorrect result was indicated by any other combination or absence of lines on the matrix.

Distribution of patients according to serum *H. pylori* antibody by ICT

The *H. pylori* frequency regarding the age group of students ranging from 18 to 22 years of age out of total 14 (47%) patients only 04 (13%) patients were found positive and n=10 (33%) found negative for *H. pylori* infection. Similarly, the frequency regarding the age group of students ranging from 23 to 28 years of age out of total 16 (53%) students only 5 (17%) student were found positive and n=11(37%) for *H. pylori* was shown in Fig. 4.1.

RESULTS

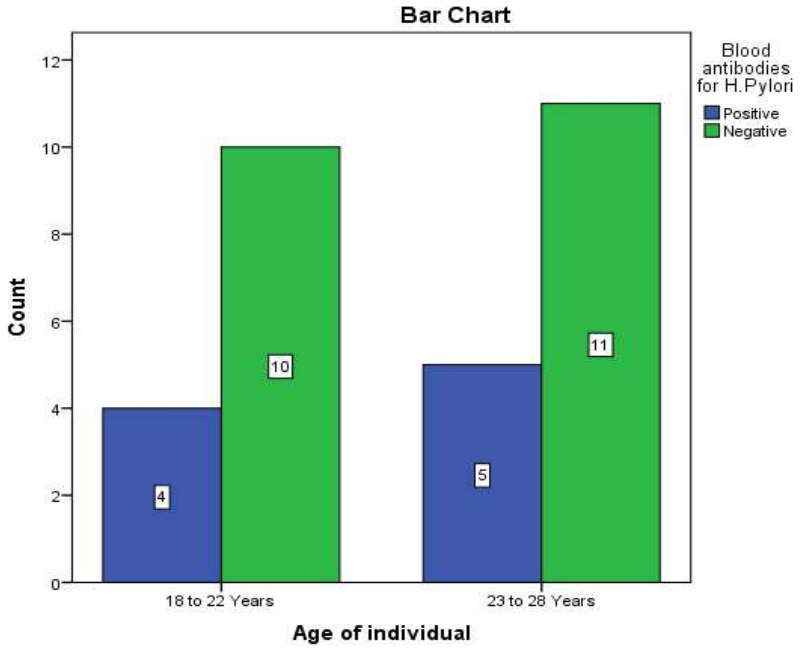

Fig.4.1. Age wise distribution of patient

Distribution of patients according to stool antigen test

The *H. pylori* frequency regarding the age group of students ranging from 18 to 22 years of age out of total n=14 (47%) patients only n=13 (93%) patients were found positive and n=1(7%) found negative for *H. pylori* infection. Similarly, the frequency regarding the age group of students ranging from 23 to 28 years of age out of total n=16 (53%) students only 12 (69%) students were found positive and n=4 students were found negative for *H. pylori* was shown in Fig. 4.2.

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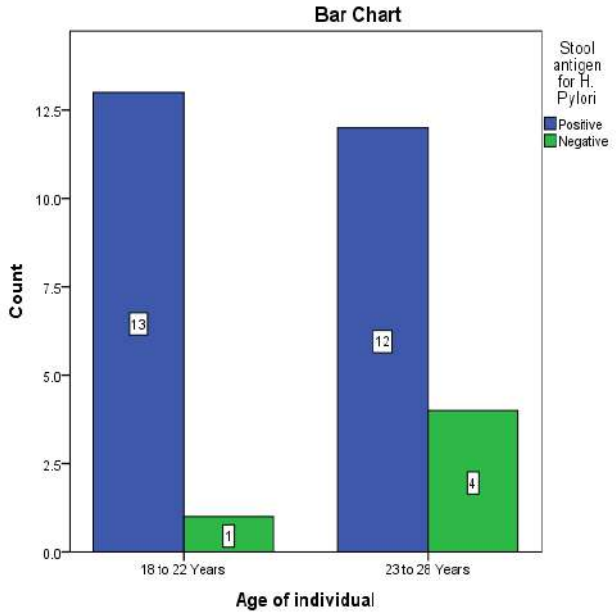

Fig.4.2. Age wise distribution H. pylori stool antigen

Identification of *H. pylori* infection by ICT *H. pylori* antibody

A total of n=30 students n=21 (70%) people was negative and n=9 (30%) people results was positive for *H. pylori* infection was shown in Table 1 and Fig.3.

Table.4 Prevalence of *H. pylori* infection by blood antibodies method

Serum *H. pylori* antigen	Frequency	Percent
Positive	9	30%
Negative	21	70%
Total	30	100%

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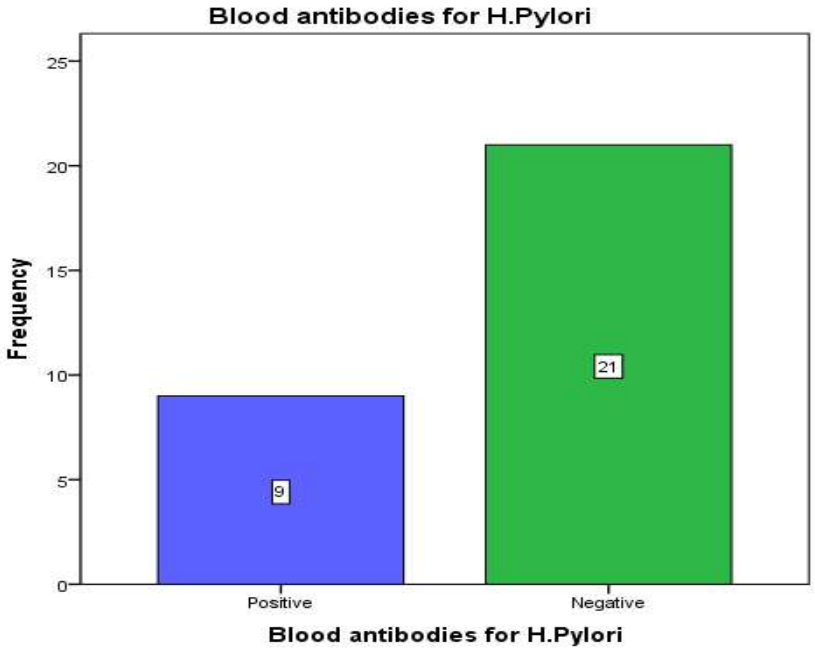

Fig.4.3. Prevalence of *H. pylori* infection by blood antibodies method

Identification of H. pylori infection by ICT H. pylori stool antigen

H. pylori infection and stool antigen test results were displayed in Table 4.2. The sensitivity and specificity of the stool antigen test in the diagnosis of H. pylori infection were n = 25 (83%) positive and n = 5 (17%) negative using the ICT test as the gold standard, as shown in figure 4.4.

Table.4.2. Prevalence of *H. pylori* infection by stool antigen method

stool antigen test	Frequency	Percent
Positive	25	83%
Negative	5	17%
Total	30	100%

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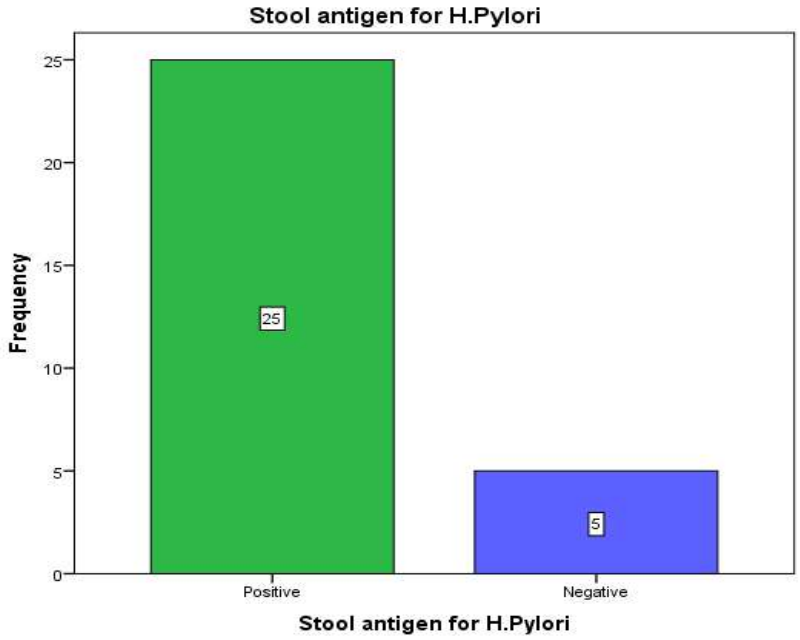

Fig.4.4. Prevalence of *H .pylori* infection by stool antigen method

Chapter 5

DISCUSSION

H. pylori One of the most prevalent long-term infections in people, it is closely linked to stomach cancers and causes chronic gastritis and peptic ulcer disease. Peptic ulcers and persistent active gastritis are strong indicators of H. pylori infection. Overcrowding, poor sanitation, and unhealthy habits encourage a high frequency of Helicobacter pylori in the populace in developing nations like Bangladesh. Researchers from all around the world have shown the link between Helicobacter pylori and gastritis, duodenal ulcers, and stomach cancer. Similar research has been conducted in our nation, and it has been noted that Helicobacter pylori is highly associated with stomach cancer and peptic ulcers. (Ahmed *et al.*, 2021) .

In our study the *H. pylori* frequency regarding the age group of students ranging from 18 to 22 years of age out of total 14 (47%) patients were found and only 04 (13%) patients were found positive for *H. pylori* infection. Similarly, the frequency regarding the age group of students ranging from 23 to 28 years of age out of total 16 (53%) students were found and only 5 (17%) student were found positive for *H. pylori*. The *H. pylori* frequency regarding the age group of students ranging from 18 to 22 years of age out of total 14 (47%) patients were found and only n=13 (93%) patients were found positive for *H. pylori* infection. Similarly, the frequency regarding the age group of students ranging from 23 to 28 years of age out of total 16 (53%) students were found and only 12 (69%) student were found positive for *H. pylori*. A total of n=30 people n=21 (70%) people was negative and n=9 (30%) people results was positive for *H. pylori* infection. Out of n=30 patients, Out of these n=9(30%) patients were found positive for *H .pylori* infection. Using ICT test as the gold standard the sensitivity and specificity of stool antigen test in the diagnosis of *H .pylori* infection was n=25 (83%) positive and n=5 (17%) was negative.

Numerous symptoms, such as nausea, vomiting, heartburn, poor appetite, etc., may be used to predict the prevalence of H. pylori, according to our study (Nisar Abbas et al., 2021). According to a study conducted in Kassala State, East Sudan, nausea was the most frequent symptom associated with H. pylori infections in 25.5% of

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431 pupils. Another study found a strong correlation between H pylori and nausea. Alcohol use was shown to be more strongly correlated with active H. pylori infection in 93.3% of cases and non-vegetarian food consumption in 80% of cases. Our study's findings revealed that a large number of participants had heartburn, nausea, vomiting, abnormal bloating, low appetite, and weight loss.Diet and food habits may also be connected to H. pylori infection. 474 males in a cross-sectional survey of 634 randomly chosen men in Japan were positive for the bacterium's IgG antibody. A research from Islamabad revealed that 94.6% of dyspeptic individuals had chronic gastritis, suggesting a link between H. pylori infection and gastritis. (Nisar abbas *et al.*, 2021).

CONCLUSION

We conclude from this study that the H. pylori stool antigen test is a quick and simple way to diagnose H. pylori infection, and that it is a reliable, noninvasive way to identify H. pylori infection in patients who have not received treatment. These positive results in the post-treatment setting have not been confirmed in other studies, and additional research is required to explain these discrepancies, even though the majority of studies have demonstrated that the stool antigen test is also an accurate method for confirming H. pylori eradication 4–8 weeks after treatment. More research is also necessary to determine the exact moment following medication when H. pylori eradication is confirmed. The stool antigen test appears to be a valid method for screening individuals who have had a partial gastrectomy for H. pylori infection. Regardless of the child's age, the stool antigen test works well for both pretreatment diagnosis and posttreatment confirmation of H. pylori eradication. Lastly, the stool antigen test appears to be an affordable way to identify an H. pylori infection.

Recommendations

We recommend in our study on many things including.

1. Urging medical professionals to recommend stool antigen testing to patients in order to accurately diagnose H. pylori infections.
2. When a large number of patients need to be screened, one of the two non-invasive tests (stool antigen and anti-H. pylori antibody) might be employed as the first screening test.
3. The reduction of H. pylori infection is largely dependent on the eradication of poverty, public health awareness, socioeconomic development, and appropriate health facilities.

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