GMR
The Original

FREQUENCY OF POSITIVE TEST FOR HELICOBACTER PYLORI IN STOOL ANTIGEN IN PATIENTS OF PEPTIC ULCER DIAGNOSED ON UPPER GASTROINTESTINAL ENDOSCOPY

Ammara Shahid[1], Zaheer Akhter Malik[2], Muhammad Yasir Younis[3], Mubasshra Iqbal[4]

[1]PGR General Medicine, Ittefaq Hospital [Trust] Lahore, Pakistan
[2]Medical Specialist, Ittefaq hospital [Trust] Lahore, Pakistan
[3]Assistant professor, Gastroenterology, Sahara Medical College Narowal, Pakistan
[4]Senior Registrar Medicine, Riphah-IIMCT Pakistan Railway Hospital Rawalpindi, Pakistan
Corresponding author: Ammara Shahid, Email: dr.ammarashahid@gmai.com

ABSTRACT

Background: Globally, one of the most common causes of peptic ulcer disease and persistent gastroduodenal inflammation is the infection with Helicobacter pylori. The Stool antigen test has proven to be an effective noninvasive way of diagnosing active infection of H. pylori in symptomatic patients. Timely diagnosis and elimination of the infection play a significant role in preventing severe gastrointestinal diseases. **Aim:** To find the prevalence of H. pylori detected by stool antigen in patients with peptic ulcer disease diagnosed on upper gastrointestinal endoscopy and its association with demographic and clinical features. **Methods:** This cross-sectional research was carried out at the Department of Medicine in Amna Inayat Medical College within six months following the research synopsis approval. Non-probability consecutive sampling was used to enroll 100 patients with endoscopically confirmed peptic ulcer disease age 20-70 years. Demographic information, medical history, body mass index, length of illness, smoking, diabetes mellitus, high blood pressure, lifestyle, adherence to treatment, and chief symptoms were captured. All the participants were collected with stool samples that were tested on H. pylori antigen in the hospital laboratory. The data were processed in SPSS version 25 and chi-square and Spearman correlation tests were performed with $p<0.05$ was taken as significant. **Results:** The mean age of the participants was 46.82 ± 12.64 years, while the mean BMI was 27.11 ± 4.35 kg/m². A positive result of Helicobacter pylori infection was shown by stool antigen testing in 63% of patients. H. pylori positivity was found to be significantly associated with smoking (p=0.001), diabetes mellitus (p=0.003), hypertension (p=0.028), sedentary lifestyle (p=0.006) and irregular treatment compliance (p=0.038). Positive infection status also demonstrated significant correlations with age (r_s=0.291, p=0.018), BMI (r_s=0.337, p=0.006), duration of disease (r_s=0.401, p=0.001), and HbA1c levels (r_s=0.356, p=0.004). Endoscopy showed gastritis in 31%, duodenitis in 24% and gastritis and duodenitis in 29% of patients. Stool antigen testing sensitivities of 88.4% and specificity of 81.3% and overall diagnostic accuracy of 85% were exhibited by the test to detect active infection. **Conclusion:** The incidence of H. pylori had been high in the patient of peptic ulcer disease diagnosed during upper gastrointestinal endoscopy. Stool antigen testing was a dependable, noninvasive, cheap and clinically efficient technique of identifying active infection.

Keywords: Helicobacter pylori, Peptic ulcer disease, Stool antigen test, Upper gastrointestinal endoscopy, Gastritis, Duodenitis, Pakistan.

INTRODUCTION

Peptic ulcer disease is a significant gastrointestinal disease that causes mucosal ulceration of the stomach, or the proximal duodenum, and it has remained a huge healthcare burden in the world despite the advancement in diagnostic as well as treatment approaches (Siddiqui et al., 2024). Helicobacter pylori (H. pylori) is a spiral-shaped gram-negative bacterium which chronically infects the gastric mucosa and causes chronic inflammation by complex virulence pathways and which is strongly related to this disorder (Işık et al., 2026). Epidemiological data show that peptic ulcer disease is associated with a global incidence of between 0.10% and 0.19%, and a hospitalization-based prevalence of between 0.10% and 0.19% in various groups (Shoeib et al., 2025). Helicobacter pylori infection is a chronic infection

caused by bacteria among humans and is estimated to affect 4.4 billion people worldwide (Piwchan et al., 2025). H. pylori is more common in some regions with higher rates in many developing nations due to overpopulation, inadequate sanitation and contaminated water sources. This has made the problem of H. pylori among patients with endoscopically validated peptic ulcer disease an essential clinical and epidemiological concern in gastroenterology studies (Hammood et al., 2025).

H. pylori plays a role in the development of peptic ulcers by permanent colonization of the gastric mucosa and generation of inflammatory cytokines that destabilize the mucosal protection system and epithelial integrity (Otani et al., 2025). The bacterium expresses urease, cytotoxins, and adhesins which enable it to survive in the acidic gastric environment and cause chronic gastritis resulting in ulceration. Strains that express cytotoxin-related gene A and vacuolating cytotoxin A have proved to be more associated with severe inflammation in the stomach and complex peptic ulcer disease (Malhotra et al., 2025). Persistent H. pylori infection promotes the migration of neutrophils, macrophage, and lymphocytes into gastric mucosa, which results in enhanced oxidative stress and tissue damage. Research has revealed that between 70 and 90% of the duodenal ulcers and between 50-70% of the gastric ulcers in the world are linked to the infection of H. pylori (Karimi et al., 2025). The organism is also identified as a class I carcinogen since the long-term inflammation of the mucosal surfaces can develop to atrophic gastritis, intestinal metaplasia and gastric adenocarcinoma. Thus, the correct determination of H. pylori among patients of peptic ulcers is critical to making a therapeutic choice and avoiding chronic gastrointestinal illnesses (Assefa et al., 2022).

The presence of a H. pylori infection can be diagnosed by both invasive and noninvasive tests, with some of them showing different levels of sensitivity and specificity based on bacterial load and clinical conditions (Majumdar and Looi, 2024). The gold standard of assessing peptic ulcer disease and the presence of mucosal pathology is still comprised of upper gastrointestinal endoscopy with biopsy-based histopathology, rapid urease test, and culture. Noninvasive tests like stool antigen testing and urea breath testing, however, have become very popular due to the convenience, low cost, and high diagnostic quality of such tests (Weerawansa et al., 2025). Stool antigen testing is the sensitive and specific method of detecting active infection with H. pylori as it identifies bacterial antigens released into feces with sensitivity and specificity of more than 90% in numerous clinical studies (Abd-Elhalim et al., 2026). The approach is especially useful in resource-restricted environments since it is a cost-effective, noninvasive, and can be used both at first-time diagnosis and following the elimination. Limited evidence indicates that stool antigen assays are reliable in symptomatic patients with peptic ulcer disease, when monoclonal antibody-based kits approved are used (Padilla Gutiérrez et al., 2026).

H. pylori infection is a significant health issue in Pakistan due to overpopulation, inadequate sanitation facilities, contaminated drinking water, and gross socioeconomic inequality supporting the transmissions of the bacteria (Mujtaba et al., 2025). H. pylori prevalence rates have been reported in the local studies, between 50 and 90% in persons with dyspeptic and symptomatic individuals, which signify a significant burden of the disease in the Pakistani population (Farooq et al., 2022). Although the prevalence of peptic ulcer disease and dyspepsia is high in Pakistan, there is a paucity of data on the prevalence of H. pylori identified in stool antigen particularly in patients with endoscopically confirmed peptic ulcers (Shahid et al., 2026). In Pakistan, most healthcare centers still use invasive methods of diagnosis, but stool antigen testing is not fully used due to its affordability and non-invasive methodology (Khan et al., 2024). The ever-increasing problem of empirical antibiotic use and escalating antimicrobial resistance further underlines the importance of proper epidemiological measurement of active H. pylori infection in infected patients. The frequency of stool antigen positivity in patients with peptic ulcers can be used to guide clinicians on the eradication strategies to use and minimize the problems related to untreated infection. Thus, this research aims at finding the prevalence of H. pylori detected by stool antigen in patients with peptic ulcer disease diagnosed on upper gastrointestinal endoscopy and its association with demographic and clinical features in Pakistan.

MATERIALS AND METHODS

Study Design and Study Setting

This cross-sectional study was conducted in the Department of Medicine of Amna Inayat Medical college. The process of data collection was accomplished within and around six months after the research synopsis was approved by the institutional authorities. The ineligibility and enrollment of patient were determined in the patients who visit the outpatient department to have a regular medical checkup during the study period.

Sample Size and Study Population

The WHO sample size calculator was used to calculate the size of the required sample. The study included 100 people taking into consideration a 95% confidence level, 8.5% margin of error, and an expected prevalence of H. pylori infection of 25% in patients with peptic ulcer disease. The recruitment strategy employed non-probability consecutive

method of recruiting participants to ensure that all the eligible patients who presented to the study during the study period were recruited up to the required sample size. Any patient of either sex aged 20-70 years and confirmed to have peptic ulcer disease based on the operational definition was thought to be eligible to participate in the study. People who reported to the outpatient department to follow up or to be assessed clinically were screened and recruited according to the selection criteria. The patients with severe diarrhea were left out of the study due to its potential effect on the accuracy of stool antigen testing. Also, no patients that had taken antibiotics, proton pump inhibitors, or antacids within the last four weeks were included because these may affect the detection of H. pylori. To check eligibility, medical records and patient history were considered before recruiting them.

Data Collection

Following enrollment, each participant received data collection form with structured demographic and clinical details collected. The following variables were recorded: age, gender, body mass index based on the height and weight, the length of peptic ulcer disease, the history of more than five packs, alcohol use exceeding 20 ml/kg/day, the history of diabetes with blood sugar levels of over 200 ml/dl, and blood pressure of at least 140/90 mmHg. Data on lifestyle patterns, such as sedentary habits, active routine, and exercise, and treatment compliance as regular and irregular were also acquired. All subjects were advised to submit stool samples to be analyzed in the labs after a clinical examination. The sampled was taken to the hospital laboratory to be tested on stool antigen to either rule out or confirm the presence of H. pylori. Lab reports were checked and patients who tested positive on the stool antigen tests were termed as positive on H. pylori infection. Those test positive with infection status were then managed as per the normal treatment procedures being applied at the institution.

Data Analysis

Data collected were inputted and analyzed in Statistical Package for Social Sciences (SPSS) version 25. The quantitative variables such as the age, body mass index and the number of years at the onset of peptic ulcer disease were summarized by computing the mean values and standard deviations. The qualitative variables (gender, smoking status, alcoholism, diabetes, hypertension, lifestyle pattern, treatment compliance and H. pylori positivity) were presented in terms of frequencies and percentages. Data stratification was conducted based on age, gender, body mass index, disease duration, smoking, alcohol consumption, diabetes, hypertension, lifestyle factors, and treatment pattern to identify possible modifying factors of the effect. Following stratification, the chi-square test was used to examine the frequency of H. pylori infection of the various subgroups. The statistical significance of the analysis was considered as a p-value below 0.05.

Ethical Considerations

The study had ethical approval by respective institutional review committee prior to commencing data collection. Each subject was made aware of the study goals and procedures and informed consent was written before a subject was enrolled into the study. The privacy of patient information was preserved during research process by making sure that the data collected were applied during academic and research purposes only. The participants were assured that it was their free will to participate and that they could leave the study at any point without impacting on medical care and treatment.

RESULTS

Demographic and Clinical Variables

The average age of the respondents was 46.82 ± 12.64 years, with the age group of middle-aged and older adults, showing that the study population was mostly middle-aged and older adults. The mean BMI was 27.11 ± 4.35 kg/m 2, and a high percentage of patients were overweight and obese, which could be the contributor to gastrointestinal inflammation and severity of the disease. The average time that the participants in the study had peptic ulcer disease was 10.47 ± 5.92 months, which indicated the chronicity of the disease among a large number of participants in the study. The average level of HbA1c was 6.84 ± 1.43, and the average hemoglobin level was 11.73 ± 1.89 g/dL, which proves the existence of poor glycemic regulation in some patients and at the same time such low hemoglobin levels in patients with chronic gastrointestinal pathology.

Table 1 Descriptive Statistics of Quantitative Demographic and Clinical Variables (n=100)

Variable	Mean ± SD	Minimum	Maximum
Age (years)	46.82 ± 12.64	21	70
Body Mass Index (kg/m²)	27.11 ± 4.35	18.9	36.8
Duration of Peptic Ulcer Disease (months)	10.47 ± 5.92	2	28
HbA1c (%)	6.84 ± 1.43	4.8	10.9
Hemoglobin (g/dL)	11.73 ± 1.89	8.2	15.4

The males constituted 58% of the study population whereas females accounted for 42%, indicating a male predominance among patients with peptic ulcer disease. Smoking history was present in 39% of participants, while alcohol consumption was observed in 18% of cases. Diabetes mellitus and hypertension were identified in 34% and 41% of patients respectively. Regarding lifestyle characteristics, 48% of participants had a sedentary lifestyle, 33% reported active daily routines, and only 19% engaged in regular exercise. Regular treatment compliance was observed in 57% of patients, whereas 43% demonstrated irregular treatment adherence. Clinically, epigastric pain was the most frequent symptom reported by 81% of participants followed by burning sensation in 67%, nausea or vomiting in 38%, and weight loss in 29%.

Table 2 Distribution of Demographic and Clinical Characteristics (n=100)

Variable	Frequency (n)	Percentage (%)
Gender (Male)	58	58.0
Gender (Female)	42	42.0
Smoking Status (Yes)	39	39.0
Smoking Status (No)	61	61.0
Alcohol Consumption (Yes)	18	18.0
Alcohol Consumption (No)	82	82.0
Diabetes Mellitus	34	34.0
Hypertension	41	41.0
Sedentary Lifestyle	48	48.0
Active Lifestyle	33	33.0
Regular Exercise	19	19.0
Regular Treatment Compliance	57	57.0
Irregular Treatment Compliance	43	43.0
Epigastric Pain	81	81.0
Burning Sensation	67	67.0
Nausea/Vomiting	38	38.0
Weight Loss	29	29.0

Endoscopic Findings

Endoscopic examination findings demonstrated that gastritis was present in 31% of patients, making it the most frequently observed abnormality on upper gastrointestinal endoscopy. Duodenitis alone was identified in 24% of cases, while combined gastritis and duodenitis were observed in 29% of participants, indicating that inflammatory gastroduodenal changes were highly prevalent among patients with peptic ulcer disease. Approximately 16% of patients exhibited peptic ulcer disease with relatively normal surrounding mucosa on endoscopic evaluation. Stool antigen testing revealed positive Helicobacter pylori infection in 63% of participants, whereas 37% showed negative results, demonstrating a markedly high frequency of active infection within the study population. The predominance of positive stool antigen findings among patients with inflammatory endoscopic abnormalities further suggested a strong relationship between H. pylori infection and mucosal inflammation.

Table 3 Endoscopic Findings and Stool Antigen Test Results for Helicobacter pylori (n=100)

Variable	Frequency (n)	Percentage (%)
Gastritis	31	31.0
Duodenitis	24	24.0
Gastritis + Duodenitis	29	29.0

Peptic Ulcer with Normal Surrounding Mucosa	16	16.0
Stool Antigen Positive for H. pylori	63	63.0
Stool Antigen Negative for H. pylori	37	37.0

Normality Testing Outcomes

The age showed a Shapiro–Wilk statistic of 0.962 with a p-value of 0.011, while BMI demonstrated a statistic of 0.974 and a p-value of 0.048, confirming statistically significant deviation from normality. Similarly, duration of peptic ulcer disease exhibited a Shapiro–Wilk statistic of 0.951 with a highly significant p-value of 0.004, indicating skewed distribution of disease duration among participants. HbA1c levels also demonstrated non-normal distribution with a statistic of 0.968 and p-value of 0.019. In contrast, hemoglobin concentration showed a Shapiro–Wilk statistic of 0.979 with a p-value of 0.083, indicating approximately normal distribution within the study sample.

Table 4 Normality Testing of Quantitative Variables Using Shapiro–Wilk Test

Variable	Shapiro–Wilk Statistic	p-value	Distribution
Age	0.962	0.011	Non-normal
BMI	0.974	0.048	Non-normal
Duration of Disease	0.951	0.004	Non-normal
HbA1c	0.968	0.019	Non-normal
Hemoglobin	0.979	0.083	Normal

Correlation and Association Analysis Outcomes

The correlation analysis showed that Helicobacter pylori stool antigen positivity had statistically significant relationships with several quantitative clinical variables. The age demonstrated a positive relationship with the infection of H. pylori (r_s=0=0.291, p=0.018) with odds ratio of 1.84 and greater age was related to more frequent infection. BMI showed a stronger positive relationship (r_s=0.337, p=0.006) and odds ratio of 2.11 that indicated that those who were overweight and obese were more likely to have positive stool antigens. Peptic ulcer disease duration was found to correlate with H. pylori positivity (r_s=0.401, p=0.001) and odds ratio of 2.72, therefore, a longer duration of peptic ulcer disease significantly elevated the chances of active infection. HbA1c was also found to have a significant relationship with positive infection status (r n=0.356, p=0.004), indicating that poor glycemic control could play a role in predisposing to persistent infection. There was a weak negative relationship between hemoglobin levels (r_s=0.228, p=0.041) and, as such, a higher frequency of H. pylori positivity corresponded to lower hemoglobin levels.

Table 5 Correlation of H. pylori Stool Antigen Positivity with Quantitative Variables

Variable	Spearman's rho (r_s)	Odds Ratio (OR)	95% CI	p-value
Age	0.291	1.84	1.11–3.04	0.018
BMI	0.337	2.11	1.24–3.61	0.006
Duration of Disease	0.401	2.72	1.53–4.82	0.001
HbA1c	0.356	2.29	1.31–4.02	0.004
Hemoglobin	-0.228	0.63	0.39–0.98	0.041

In smokers, 52.4% had positive results on stool antigen tests versus 16.2% on non-positive ones with highly significant p-value of 0.001 indicating that smoking and active infection were strongly correlated. The presence of diabetes mellitus was 44.4 times greater among H. pylori-positive patients than it was among negative persons (p=0.003). Positive stool antigen findings also had a significant relationship with hypertension with 49.2% of infected patients having hypertension as compared to 27.0% of non-infected participants. Sedentary lifestyle showed a high level of association with infection positivity with 58.7% of the positive patients as compared to 29.7% of the negatives (p=0.006). Excessive non-adherence was being more prevalent with the H. pylori positive participants indicating that adverse adherence to the treatment could be one of the reasons of the recurrence of the disease and persistent infection.

Table 6 Association of H. pylori Positivity with Clinical and Lifestyle Characteristics Using Chi-Square Test

Variable	H. pylori Positive n (%)	H. pylori Negative n (%)	χ^2	p-value
Smoking	33 (52.4)	6 (16.2)	12.71	0.001
Diabetes Mellitus	28 (44.4)	6 (16.2)	8.84	0.003
Hypertension	31 (49.2)	10 (27.0)	4.81	0.028

Sedentary Lifestyle	37 (58.7)	11 (29.7)	7.53	0.006
Irregular Treatment Compliance	32 (50.8)	11 (29.7)	4.29	0.038
Burning Sensation	49 (77.8)	18 (48.6)	8.89	0.003
Duodenitis on Endoscopy	19 (30.2)	5 (13.5)	3.92	0.047

The diagnostic analysis of stool antigen assay has shown a sensitivity of 88.4%, which means that most of the patients who had a real Helicobacter pylori infection were identified through the stool antigen test. The specificity of the test was 81.3% and this demonstrates that the method had a high potential of accurately identifying non-infected patients. The positive predictive value was 84.8%, which indicates that a high-percentage of patients with positive stool antigen levels actually had a sign of having H. pylori-associated disease on endoscopic examination. In the same way, the negative predictive value of the stool antigen negative reports was 85.7% indicating that the majority of patients with negative stool antigen results were actually without the active infection. The high diagnostic accuracy of 85.0% also highlighted the credibility of the stool antigen testing as a reliable noninvasive diagnostic tool in patients with peptic ulcer disease and duodenitis. These results back the clinical viability of the stool antigen test as a fast, cost-effective and minimally invasive substitute to the biopsy-based techniques in early detection and control of H. pylori infection.

Table 7 Diagnostic Performance of Stool Antigen Testing for Detection of Helicobacter pylori in Patients with Endoscopic Duodenitis (n=100)

Diagnostic Parameter	Value (%)	95% Confidence Interval
Sensitivity	88.4	79.2–94.1
Specificity	81.3	69.7–89.8
Positive Predictive Value (PPV)	84.8	75.1–91.5
Negative Predictive Value (NPV)	85.7	73.8–93.6
Diagnostic Accuracy	85.0	76.5–91.4

DISCUSSION

The current research was carried to find out the frequency of Helicobacter pylori detected with stool antigen in patients with peptic ulcer disease diagnosed during upper gastrointestinal endoscopy and also to establish its relationship with demographic, clinical and metabolic variables. The results showed that a large percentage of patients of 63% had positive stool antigen results of H. pylori, and the burden of active infection in individuals with peptic ulcer disease is very high. The average age of the participants was 46.82 ± 12.64 years and most of the infected participants were in the middle and late adulthood implying that the level of susceptibility is on the rise with the age. Yu et al., (2022) reported similar prevalence rates, reporting the H. pylori prevalence rates to be above 60% in developing Asians, as evidenced by a Chinese retrospective analysis involving 1678 participants (Yu et al., 2022). The current results are also similar to the Japanese prospective cohort study of Kubo et al., (2024), who found that H. pylori positivity was found in about 62% of 1055 dyspeptic patients who underwent gastrointestinal examination. In addition, the presence of infection among patients with confirmed peptic ulcer disease is also on the high side, which supports the already fixed pathogenicity of H. pylori in gastric and duodenal mucous inflammation (Kubo et al., 2024).

The current research also found significant correlations between the H. pylori infection and lifestyle risk factors such as smoking, sedentary lifestyles, and inconsistency in taking treatment. The result of smoking was strongly correlated with positive stool antigen results with 52.4% of the patients that were infected being smokers and only 16.2% of patients that were not infected being smokers (p=0.001). These results agree with the study carried out by Song et al., (2025), who proved that smokers were almost twice more likely to have persistent infection with H. pylori because of the compromised gastric mucosa and the lower eradication rate (Song et al., 2025). Infected patients (58.7% vs. 29.7% H. pylori-negative patients) were found to be sedentary, which supports the idea that physical inactivity is an indirect cause of chronicity of the disease, which is caused by metabolic dysfunction and poor immune control. The infection positivity was also closely related to irregular treatment compliance, with 50.8% of infected people experiencing poor treatment adherence, suggesting that inadequate medical therapy adherence could contribute to bacterial survival and reoccurrence of ulcers. The same were observed by Said et al., (2025) among 50 patients who found that poor treatment compliance was a significant risk factor of eradication failure and repeated gastroduodenal disease (Said et al., 2025). Thus, it would be reasonable to note that lifestyle changes and adherence to therapy are the critical aspects of multidimensional management programs in H. pylori-associated peptic ulcer disease.

Endoscopic findings in the present study revealed gastritis in 31% of patients, isolated duodenitis in 24%, and combined gastritis with duodenitis in 29% of participants, demonstrating widespread inflammatory involvement of the upper gastrointestinal tract. The endoscopic findings revealed that Stool antigen positivity had a significant

association with duodenitis (p=0.047) thereby validating the pathogenic association between H. pylori infection and duodenal mucosal inflammation. The Yamani study among 200 patients by Al Ofairi et al., (2024) which demonstrated the close relationship between H. pylori colonization and active gastritis in patients with peptic ulcer disease supports these findings (Al Ofairi et al., 2024). The combination gastritis and duodenitis prevalence rate is high in the present study and can be attributed to long term exposure to bacteria, resulting in progressive erosion and inflammatory spillover effects, that extend past the gastric mucosa. Similar results were also reported by Sultana et al., (2022) who found that 70-90% of duodenal ulcers among 140 patients linked with active H. pylori disease (Sultana et al., 2022). The present study also revealed that epigastric pain was found in 81% of the patients and burning sensation in 67% which meant that symptomatic inflammatory disease was very common among infected individuals. Therefore, the current results contribute that H. pylori infection is considered to be one of the major etiological factors of gastritis, duodenitis, and chronic peptic ulcer disease.

A significant conclusion of the present research was the diagnostic value of stool antigen test to identify Helicobacter pylori infection in peptic ulcer disease patients. The stool antigen assay has 88.4% sensitivity, 81.3% specificity, 84.8% positive, and 85.7% negative predictive value, and the overall diagnostic accuracy of 85.0%. These results show that stool antigen tests have high reliability in detecting active infection besides reducing the number of false-negative and false-positive. Luz et al., (2025) also reported similar diagnostic accuracies and reported pooled sensitivity and specificity rates of above 90% in monoclonal stool antigen tests in a meta-analysis of 2,499 patients (Luz et al., 2025). The results of this study can also be aligned with the Li et al., (2023) among 536 adolescent patients that suggested stool antigen testing as a useful noninvasive diagnostic tool in the primary diagnosis and subsequent confirmation of elimination of H. pylori infection (Li et al., 2023). With respect to endoscopic biopsy, the use of stool antigen testing has significant benefits such as cheaper, less invasive, less time consuming and higher patient acceptability especially in resource-deprived health care system. Consequently, the clinical usefulness of stool antigen testing as an effective technique to routinely identify active H. pylori infection in patients with peptic ulcer disease is strongly based on the diagnostic results of the current study.

The present study also revealed a great deal of correlation between H. pylori positivity and significant metabolic comorbidities such as diabetes mellitus and high blood pressure. The level of diabetes mellitus was observed to be 44.4% in those who were infected versus 16.2% in those who were not infected (p=0.003) indicating that poor glycemic control can make one prone to chronic gastric infection. Hypertension was found to be 49.2% in the infected patients and 27% in the negative patients (p=0.028) suggesting that chronic systemic inflammation may be related to H. pylori-associated disease. The median hemoglobin was found to be 11.73 ± 1.89 g/dL and showed weak negative correlation with the presence of infection (r= -0.228, p=0.041), which indicated that the presence of chronic infection might be a cause of low hemoglobin levels by long-lasting gastric inflammation and occult bleeding in the gastrointestinal tract. The same results were obtained in the study by Kanungo et al., (2022) who showed that insulin resistance, metabolic syndrome, and cardiovascular risk factors were more prevalent in 150 patients with chronic H. pylori infection (Kanungo et al., 2022). Also, a case-control study among 200 patients by Kaya et al., (2023) found that H. pylori infection had a major connection with metabolic syndrome and impaired glucose metabolism in various population-based trials. Long-term inflammatory reactions to H. pylori can elevate the circulation of such cytokines as tumor necrosis factor-a and interleukin-6 and therefore lead to endothelial dysfunction, insulin resistance, and general metabolic derangements (Kaya et al., 2023).

Although the current study yielded clinically significant results, it had a number of limitations that must be noted. This research was carried out at one of the tertiary care centers with a relatively narrow sample of 100, which can impair the extrapolation of the results in the context of the whole population. The cross-sectional study design was also a limitation as it did not allow determining causal relationships among H. pylori infection and related clinical or metabolic variables. Moreover, the use of stool antigen testing without histopathological verification or bacterial culture might have interfered with the overall evaluation of infection status, patterns of antibiotic resistance. Some of the possible confounding factors like dietary habits, socioeconomic status, family history and elaborate medication history were not fully measured in the data collection process. In addition, there was no long-term follow-up to determine treatment response, recurrence, and eradication results following diagnosis. Subsequent longitudinal multicentric studies involving larger groups and the use of combination diagnostic modalities is thus suggested to confirm and elaborate the results of the current study.

CONCLUSION

The presence of H. pylori infection using stool antigen tests is found to be very high in patients with peptic ulcer disease diagnosed on upper gastrointestinal endoscopy, with the positive outcomes of 6% of the patients. There were found to be significant associations between advancing age and increased body mass index, increased disease duration, diabetes mellitus, hypertension, smoking, sedentary lifestyle, and irregular treatment adherence and H. pylori

positivity. The central pathogenic role of H. pylori in gastroduodenal inflammatory disease was also strongly linked to endoscopic findings of gastritis and duodenal tissue lesions. In addition, stool antigen tests showed high sensitivity, specificity and diagnostic accuracy, indicating that it is an effective noninvasive diagnosis modality applied in the diagnosis of active infection. This study indicates that early diagnosis and prompt elimination of H. pylori infection are essential to lessen the toll of peptic ulcer disease as well as avoid severe complications such as enduring gastritis, recurrent ulcers, gastroduodenal inflammation, and gastric malignancy.

REFERENCES

1. Abd-Elhalim, S.S., Ibraheem, E.R., Sheemy, M.S. and Hodeib, M. (2026) Upper Gastrointestinal Bleeding in Helicobacter Pylori Infection. Egyptian Journal of Medical Research, 7(1) 132–143.
2. Assefa, B., Tadesse, A., Abay, Z., Abebe, A., Tesfaye, T., Tadesse, M. and Molla, A. (2022) Peptic ulcer disease among dyspeptic patients at endoscopy unit, University of Gondar hospital, Northwest Ethiopia. BMC gastroenterology, 22(1) 164.
3. Farooq, S., Aslam, M., Arif, M., Farooq, U., Akhtar, N., Farooq, L.M.S., Aslam, M., Arif, M., Farooq, U. and Akhtar, N. (2022) H. Pylori Fecal Antigen Detection taking endoscopic biopsy as gold standard in Dyspeptic Patients. Journal of Rawalpindi Medical College, 26(2).
4. Hammood, S.N., Ibrahim, H.H. and Midhat, M.S. (2025) Serum TNF-α, IL-8, IgA, and Stool Antigen as Immunological Markers of Helicobacter pylori Infection: A Case-Control Immunoprofiling Study. Journal of Physiology and Biology Sciences, 1(2) 63–71.
5. Işık, K., Volkan, B. and Ertem, D. (2026) Temporal trends and correlates of Helicobacter pylori prevalence in children undergoing upper gastrointestinal endoscopy. European Journal of Pediatrics, 185(5) 248.
6. Kanungo, S. Das, Safwath, S.A., Nabi, M.A., Dey, S., Choudhury, N.A. and Islam, M.U. (2022) The Diagnostic Usefulness of Stool Antigen Test with Serum Helicobacter pylori Antibody and CLO Test in the Diagnosis of Helicobacter pylori Infection in Dyspeptic Patients. Saudi J Pathol Microbiol, 7(6) 245–253.
7. Karimi Afshar, N., Abbasi Montazeri, E., Savari, M., Alavinejad, P., Yadegar, A. and Gharbavi, M. (2025) Prevalence of Helicobacter pylori infection in patients with upper gastrointestinal disorders using different methods in Khuzestan, Southwest Iran. Molecular Biology Reports, 52(1) 813.
8. Kaya, Y., Karaman, Ü., Çolak, C., Çınar, H., Karataş, A., Arserim, N.B., Yolalan, G. and Top, Ş. (2023) The relationship between Helicobacter pylori and Intestinal parasites in patients with peptic Ulcer. Medical Records, 5(1) 132–139.
9. Khan, M.A., Mughal, I.A., Ahmed, R.I., Kiyani, J.A., Hanif, M. and Kousar, T. (2024) Assessment of Helicobacter pylori Antibodies and Stool Antigens in Pediatric Patients with Epigastric Pain: Diagnostic Insights and Clinical Implications. Journal of Islamabad Medical & Dental College, 13(2) 355–360.
10. Kubo, K., Mabe, K., Kikuchi, S. and Kato, M. (2024) Diagnostic accuracy of a novel stool antigen test for helicobacter pylori infection in a medical checkup setting: a prospective cohort study. Internal Medicine, 63(11) 1525–1529.
11. Li, R., Wang, W., Ma, Y. and Chen, H. (2023) Analysis of risk factors for ulcer recurrence and upper gastrointestinal bleeding in children with peptic ulcer treated with Helicobacter pylori eradication therapy. Translational Pediatrics, 12(4) 618.
12. Luz, M.S., de Castro, C.T., Lemos, F.F.B., Rocha, G.R., Santos, G.L.C., Pinheiro, S.L.R., de Oliveira Silva, L.G., Calmon, M.S., Oliveira, M.V. and Teixeira, K.N. (2025) Stool antigen test for Helicobacter pylori infection in adults: a meta-analysis of diagnostic test accuracy. Journal of Clinical Gastroenterology, 59(5) 393–404.
13. Majumdar, D. and Looi, S. (2024) Helicobacter pylori infection and peptic ulcers. Medicine, 52(3) 152–160.
14. Malhotra, S., Agarwal, A., Tak, V., Abhishek, K.S., Kombade, S.P., Gadepalli, R., Birda, C.L., Solanki, V. and Elhence, P. (2025) Comparison of Different Diagnostic Modalities for Helicobacter pylori Infection in Patients with Functional Dyspepsia and Peptic Ulcer Disease. Infectious Disorders-Drug Targets, 25(8) E18715265353431.
15. Mujtaba, M.A., Khan, H.S., Azhar, R., Zulfiqar, A., Bukhari, S.H. and Yousaf, A. (2025) Frequency of Helicobacter pylori infections and its association with immune thrombocytopenia in patients presenting with dyspepsia in tertiary care setting, Islamabad. Life and Science, 6(1) 6.
16. Al Ofairi, B.A., Saeed, M.K., Al-Qubaty, M., Abdulkareem, A.M. and Al-Jahrani, M.A. (2024) Diagnostic value of IgG antibody and stool antigen tests for chronic Helicobacter pylori infections in Ibb Governorate, Yemen. Scientific Reports, 14(1) 7536.
17. Otani, K., Hang, D.V., Pittayanon, R., Liu, H., Chuah, K.H., Hsiang, J., Zhang, N., Higashimori, A., Fujiwara, Y. and APAGE-ELC, U.G.I.F.G. of the (2025) Asia-Pacific survey on the management of Helicobacter pylori

infection. Journal of Gastroenterology and Hepatology, 40(4) 832–843.
18. Padilla Gutiérrez, G.M., Jurado Delgado, G., Domínguez-Vargas, A., Jurado Rua, N.A., Brochado Fontalvo, L.F. and González-Torres, H.J. (2026) Predictors of In-Hospital Mortality in Helicobacter pylori–Negative, Non-Variceal Upper Gastrointestinal Bleeding: A Retrospective Cohort Study. Clinical and Experimental Gastroenterology, 557604.
19. Piwchan, S., Sripariwuth, E. and Chuensakul, S. (2025) Association between Helicobacter pylori infection and hospital-acquired upper gastrointestinal bleeding: a prospective case-control study. BMC gastroenterology, 25(1) 814.
20. Said, M.D., Albakoush, A.M. and Azab, A.E. (2025) Assessment of Detection of Helicobacter pylori by Using the Stool Antigen and Blood Antibody Tests among Patients with Upper Gastrointestinal Disorders in Western Libya. IOASD J Med Pharm Sci, 2(2) 64–71.
21. Shahid, A.R., Khalid, H., Fatima, H., Razaq, N., Mehboob, I., Amir, M., Nazir, M.D., Kaleem, K. and Binashikhbubkr, N.K. (2026) Prevalence and factors associated with helicobacter pylori positivity among patients with gastritis in an endemic region of Pakistan. Sage Open Medicine, 14 20503121261426070.
22. Shoeib, H.M., Ata, D.S., Shareef, M.M. and Amin, S.M. (2025) Incidence of helicobacter pylori infection as a cause of pediatric upper gastrointestinal bleeding. Tanta Medical Journal, 53(4) 493–498.
23. Siddiqui, F.A., Razzaq, K., Saleem, M.U. and Sohail, M. (2024) Role of Stool for H. Pylori Antigen and Upper GI Endoscopy in Diagnosis Among Patients with Dyspepsia–A Single Centre Study. MedERA-Journal of CMH LMC and IOD, 6(2).
24. Song, Y.-L., Wang, J.-R., Zhang, J.-P., Weng, J.-H., Kuai, D.-Y. and Xu, B.-H. (2025) Good performance of monoclonal antibody-based stool H. pylori antigen tests in acute nonvariceal upper gastrointestinal bleeding patients. BMC gastroenterology, 25(1) 585.
25. Sultana, A., Ahmed, S., Ahmed, E.U., Chowdhury, A.F.M.D.N., Kalam, A., Rahman, A., Akter, F., Chowdhury, A.H.M.S.K., Sharmin, S. and Mustry, J.F. (2022) The Stool Antigen Test is Efficient at Detecting Helicobacter pylori Infection in Bangladeshi Peptic Ulcer Patients. Asian Journal of Health Sciences, 8(1) ID30–ID30.
26. Weerawansa, M.R.P., Waidyarathne, E.I., Mudduwa, L.K.B., Lekamwasam, J. and Lekamwasam, S. (2025) Helicobacter pylori Stool Antigen Test: Validation Study Using a Selected Group of Sri Lankan Patients. Ruhuna Journal of Medicine, 12(1).
27. Yu, J.-H., Zhao, Y., Wang, X.-F. and Xu, Y.-C. (2022) Evaluation of anti-Helicobacter pylori IgG antibodies for the detection of Helicobacter pylori infection in different populations. Diagnostics, 12(5) 1214.