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Original Research Article

Frequency of Helicobacter Pylori Infection Among Patients With Dyspepsia

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Abstract: *Helicobacter pylori (H. pylori) is a globally prevalent pathogen, infecting nearly half of the world's population. It is strongly associated with a spectrum of gastrointestinal disorders, including chronic gastritis, peptic ulcer disease, and gastric malignancies. Early detection of H. pylori infection, particularly among dyspeptic individuals, is essential for prompt treatment and prevention of complications.* ***Objective:*** *To determine the frequency of Helicobacter pylori infection among patients presenting with dyspepsia at tertiary care hospitals in Quetta and Turbat, Pakistan.* ***Methods:*** *This descriptive cross-sectional study was conducted at the Department of Internal Medicine, Sandeman Provincial Hospital, Quetta, and the Department of Medicine, Teaching Hospital, Turbat from January 2023 to December 2023. A total of 145 adult patients presenting with clinical features of dyspepsia and fulfilling the inclusion criteria were enrolled after obtaining informed written consent. Detailed history and clinical examination were performed. Stool samples were collected from all participants and tested for Helicobacter pylori stool antigen (HPSA) using enzyme immunoassay. Data were analyzed to determine the frequency of H. pylori infection.* ***Results:*** *Out of 145 patients with dyspepsia, 93 (64.1%) were males and 52 (35.9%) were females. The mean age of the study population was 29.95 ± 4.71 years. H. pylori infection was detected in 99 patients, representing a prevalence of 68.3%. Infection was more common among males and individuals residing in urban areas.* ***Conclusion:*** *The prevalence of Helicobacter pylori infection among dyspeptic patients in this study was notably high, especially in young males and those from urban settings. These findings highlight the need for routine screening and early eradication therapy in symptomatic individuals to reduce gastrointestinal morbidity.*

Keywords: Dyspepsia, Helicobacter Infections, Helicobacter pylori, Prevalence, Stool Tests, Urban Health

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Introduction

Dyspepsia is one of the most common causes of referral to gastroenterology clinics,accounting for 40% of these visits. Dyspepsia is a common gastric disease that can beassociated with Helicobacter pylori infection (1). Helicobacter pylori (H. pylori) infection is extremely common worldwide, with evidence from a recent systematic review suggesting that almost half of the world's population is infected (2). Infection rates are higher in resource-poor settings and developing countries, with prevalencerates above 70% reported in Africa, the highest worldwide (1). The high prevalence indeveloping countries has been associated with overcrowding, poor housing, poor sanitation, and unclean water supplies (3, 4). The prevalence of Helicobacter pylori (H. pylori) infection is reported to be more than 50% worldwide. It has been associated with peptic ulcer disease, gastric carcinoma, and mucosal-associated lymphoid tissuelymphoma. The seroprevalence of H. pylori varies greatly among societies and geographical locations (5).

Several methods exist for detecting the infection. Serologic H. pylori detection testsare non-invasive and are based on finding antibodies to the bacteria in serum, saliva,or urine. A positive serological test, therefore, indicates exposure, not an ongoing infection. As such, serology is considered inferior to other direct non-invasive tests like the urea breath test and the stool antigen test in clinical practice (6). In most cases, H. pylori infection is asymptomatic. Of those tested for H. pylori, 17% will develop peptic ulcers (7). The infection occurs during early childhood, and if left untreated, it may persist for a lifetime (8). In the Hamrah et al (5). Study, the overall seroprevalence of H. pylori was 75.6% among dyspeptic patients. In the Aminde et al (9). Study, the overall H. pylori seroprevalence was 51.5%. Yakoob et al study conducted in Karachi, Pakistan, showed a low rate of recurrence of H. pylori infection in patients with dyspeptic symptoms.

The rationale of the study is to measure the frequency of Helicobacter Pylori infection among patients with dyspepsia in our population, as there is no local studypublished during the last 5 years in this regard. As a large number of the population in Pakistan belongs to rural areas and poor socio-economic status, most patients reported very late due to a lack of medical facilities and financial constraints compared to other developed countries. Therefore, it is important to investigate therecent status of it in our setup, which will be helpful in knowing the actual burden ofthe disease in our setup. Helicobacter pylori is a spiral-shaped bacterium that grows in the digestive tract. Helicobacter pylori infection has a very high prevalence, (11). And may bepresent in more than half of the world's population. It infects the stomach during childhood. Helicobacter pylori infections, along with Epstein-Barr infection, are known risk factors for gastric carcinoma (12). Up to50% of the gastric ulcers and 80% of the duodenal ulcers are associated withthis infection, and the eradication of the organism significantly reduces the risk of ulcer recurrence (13). Which will later evolve into a chronic activegastritis that can affect either the antrum (associated with increased acid accretion and duodenal ulcers), the corpus (associated with gastric atrophy and

achlorhydria), or both (14). Most studies showed a higher cumulative incidence of gastric cancer in countries with a higher prevalence of infection. Helicobacter pylori was associated with an increased risk of both diffuse and intestinal types of gastric cancer. Strategy in the development of gastroesophageal reflux disease, obesity, and allergic diseases after Helicobacter pylori eradication (15). Helicobacter pylori may represent the main, but not the only, microbial trigger for different gastric diseases, and that microorganisms, other than Helicobacter pylori, may play a relevant role in the development of complications in Helicobacter pylori–related gastritis (16). Many bacterial communities, from Prevotella to Streptococcus, have been identified in atrophic gastritis. Diagnostic tests are indicated in patients: with active peptic ulcer disease (duodenal or gastric), With a history of peptic ulcer disease, who have not been previouslytreated, with low-grade gastric MALT lymphoma, who have undergone endoscopic resection of early gastric cancer, With uninvestigated dyspepsia, younger than 55 years old (without alarm symptoms). Available tests for the detection of Helicobacter pylori include: Antibody tests, Urea breath tests, Stool antigen tests, and Endoscopic biopsies. Recurrence (reinfection or recrudescence) of the Helicobacter pylori infection after the eradication therapy is also an important issue. Reinfection is definedas infection by a new Helicobacter pylori strain after the confirmation of a successful eradication. Recrudescence is defined as the reactivation of the same strains that became undetected after eradication therapy. Yet, reinfection and recrudescence could not be differentiated in most of the epidemiological studies. Investigated dyspepsia describes patients who had an endoscopy and in whomno mucosal lesions were found, but were found to have an H pylori infection on biopsy.

Thus, the objective of the study was to determine the frequency of Helicobacter Pylori infection amongpatients with dyspepsia at a tertiary care hospital, Quetta.

Methodology

This cross-sectional study was conducted to evaluate the frequency of *Helicobacter pylori* infection among patients presenting with dyspeptic symptoms. The study was carried out at two tertiary care centers: the Department of Internal Medicine, Sandman Provincial Hospital, Quetta, and the Teaching Hospital Turbat from January 2023 to December 2023 . Both inpatient and outpatient departments were included to capture a broader clinical spectrum of dyspepsia. The sample size of 145 was calculated using the standard formula for cross-sectional studies. Participants aged between 18 and 40 years, of either gender, who experienced symptoms of dyspepsia lasting for more than three months as per the operational definition, were eligible for inclusion. Dyspepsia was defined by symptoms such as upper abdominal discomfort, bloating, or early satiety occurring persistently for over 12 weeks. Patients with dyspeptic symptoms accompanied by alarming features were excluded. These features included anemia (hemoglobin <12 g/dL in males and <11 g/dL in females), significant weight loss (>5 kg within the past six months), prolonged vomiting (lasting more than one month), or dysphagia, all of which necessitate further evaluation via upper gastrointestinal endoscopy rather than stool antigen testing.

Additionally, patients with end-stage renal disease (defined as glomerular filtration rate <15 mL/min), chronic liver disease (diagnosed based on history, clinical examination, and ultrasonography findings such as coarse liver echo texture, irregular margins, splenomegaly, and a portal vein diameter >13 mm), and those with known metastatic disease (identified clinically and through imaging) were excluded. These conditions are commonly associated with dyspeptic symptoms secondary to systemic illness or stress, thus potentially confounding the diagnostic value of *H. pylori* stool antigen testing. The aim was to ensure the enrolled population represented uncomplicated dyspeptic patients, thereby improving the diagnostic specificity for *H. pylori* infection.

Following approval from the College of Physicians and Surgeons Pakistan (CPSP), data collection was initiated at the outpatient departments of the Department of Internal Medicine, Sandman Provincial Hospital, Quetta, and the Teaching Hospital Turbat. Patients who met the inclusion criteria and had been experiencing dyspepsia for more than three months, according to the operational definition, were approached for participation. Written informed consent was obtained before enrolment. For each participant, demographic details such as age, gender, place of residence (urban or rural), socioeconomic status (categorized as household income below or above PKR 50,000), and education level (illiterate, primary, intermediate, or graduate and above) were recorded. A focused clinical history was taken to assess the presence of risk factors such as alcohol use and smoking, along with symptomatology including postprandial fullness, early satiation, epigastric pain, and epigastric burning.

Each enrolled participant provided a stool sample, which was analyzed in the institutional laboratory for the presence of *Helicobacter pylori* using the stool antigen test (HPSA). Samples showing curved or comma-shaped organisms were interpreted as positive. All clinical and laboratory data were documented by the principal investigator using a standardized proforma. To maintain internal validity, exclusion criteria were rigorously applied to eliminate potential confounders and bias.

Statistical analysis was conducted using SPSS version 22. Categorical variables, including gender, residence, socioeconomic status, education level, presence of dyspeptic symptoms, and *H. pylori* status (positive or negative), were summarized using frequencies and percentages. Continuous variables such as age, height, weight, body mass index (BMI), and duration of dyspepsia were reported as mean ± standard deviation. Stratification was performed for potential effect modifiers, including age, BMI, gender, residence, education, socioeconomic status, duration of symptoms, and risk factors (alcohol and smoking). The Chi-square test was used to assess the statistical association between these variables and the outcome of *H. pylori* positivity. A p-value of ≤ 0.05 was considered statistically significant throughout the analysis.

Results

A total of 145 patients with dyspepsia were included in this study. Of these, 93 (64.1%) were male and 52 (35.9%) were female. The mean age of the study population was 29.95 ± 4.71 years, the mean height was 164.01 ± 11.77 cm, and the mean weight was 73.83 ± 12.87 kg. The mean BMI was 26.19 ± 2.46 kg/m², while the mean duration of dyspepsia was 9.72 ± 2.68 months. Most patients (70.3%) had symptoms lasting between 6–11 months (Table 1).

Regarding residence, 94 (64.8%) patients belonged to urban areas, while 51 (35.2%) were from rural areas. A monthly family income of over PKR 50,000 was reported in 115 (79.3%) patients. Educational status revealed that 47 (32.4%) had primary education, 20 (13.8%) had completed intermediate, 10 (6.9%) had completed graduation or above, while 68 (46.9%) were illiterate.

The most common clinical features among the patients were early satiation (64.8%), postprandial fullness (64.1%), epigastric burning (57.2%), and epigastric pain (56.6%).

H. pylori infection was detected in 99 patients (68.3%) through the H. pylori stool antigen (HPSA) test. The association of H. pylori infection with various clinical and demographic factors is detailed in Tables 1 to 4. No statistically significant association was observed between H. pylori infection and age ($p = 0.878$), gender ($p = 0.853$), BMI ($p = 0.282$), residence ($p = 0.496$), monthly income ($p = 0.832$), educational level ($p = 0.149$), or duration of dyspepsia ($p = 0.521$). Furthermore, no significant correlation was found between H. pylori infection and the presence of epigastric pain ($p = 0.475$), epigastric burning ($p = 0.905$), postprandial fullness ($p = 0.576$), or early satiation ($p = 0.415$).

Table 1. Association of H. pylori Infection with Duration of Dyspepsia

Duration of Dyspepsia (months)	H. pylori Positive n (%)	H. pylori Negative n (%)	Total n (%)	p-value
6–11	68 (46.9%)	34 (23.4%)	102 (70.3%)	0.521
12–16	31 (21.4%)	12 (8.3%)	43 (29.7%)	
Total	99 (68.3%)	46 (31.7%)	145 (100%)	

Table 2. Association of H. pylori Infection with Epigastric Pain

Epigastric Pain	H. pylori Positive n (%)	H. pylori Negative n (%)	Total n (%)	p-value
Yes	54 (37.3%)	28 (19.3%)	82 (56.6%)	0.475
No	45 (31.0%)	18 (12.4%)	63 (43.4%)	
Total	99 (68.3%)	46 (31.7%)	145 (100%)	

Table 3. Association of H. pylori Infection with Epigastric Burning

Epigastric Burning	H. pylori Positive n (%)	H. pylori Negative n (%)	Total n (%)	p-value
Yes	57 (39.3%)	26 (17.9%)	83 (57.2%)	0.905
No	42 (29.0%)	20 (13.8%)	62 (42.8%)	
Total	99 (68.3%)	46 (31.7%)	145 (100%)	

Table 4. Association of H. pylori Infection with Postprandial Fullness

Postprandial Fullness	H. pylori Positive n (%)	H. pylori Negative n (%)	Total n (%)	p-value
Yes	65 (44.8%)	28 (19.3%)	93 (64.1%)	0.576
No	34 (23.4%)	18 (12.4%)	52 (35.9%)	
Total	99 (68.3%)	46 (31.7%)	145 (100%)	

Table 5. Association of H. pylori Infection with Early Satiation

Early Satiation	H. pylori Positive n (%)	H. pylori Negative n (%)	Total n (%)	p-value
Yes	62 (42.8%)	32 (22.1%)	94 (64.8%)	0.415
No	37 (25.5%)	14 (9.7%)	51 (35.2%)	
Total	99 (68.3%)	46 (31.7%)	145 (100%)	

Discussion

This study investigated the frequency and clinical associations of Helicobacter pylori infection among patients presenting with dyspepsia. The prevalence of H. pylori infection in our study was 68.3%, which aligns with findings from other studies conducted in developing countries, including Pakistan, where poor sanitation, overcrowding, and lack of clean water contribute significantly to the spread of the infection. For instance, a study conducted in Karachi reported a prevalence of 61.2% among dyspeptic patients using stool antigen testing (17). Similarly, Ahmed et al. documented a prevalence of 66% in Lahore, supporting our findings (18). Our analysis showed no statistically significant association between H. pylori infection and age, gender, BMI, place of residence, education level, or monthly income. These findings contrast with those of Shabbir et al., who found a significant association with lower socioeconomic status and rural background (19). The lack of association in our study might be attributed to the urban predominance in our sample (64.8%), potentially reflecting improved sanitation practices in urban households compared to rural areas. The clinical features of dyspepsia—epigastric pain, epigastric burning, postprandial fullness, and early satiation—did not show any significant correlation with H. pylori infection in our study population. This suggests that while H. pylori remains a common cause of gastritis and peptic ulcer disease, not all dyspeptic symptoms can be attributed to it. A study by Rasheed et al. in Islamabad observed similar findings, reporting no clear symptom pattern that reliably predicted H. pylori positivity in dyspeptic patients (20). Regarding the duration of symptoms, 70.3% of patients reported a dyspepsia history of 6–11 months, yet no significant association was found with H. pylori infection ($p = 0.521$). These results are consistent with research by Saeed et al., who reported that chronicity of symptoms was not a reliable indicator for H. pylori positivity (21). Furthermore, epigastric pain was the most common symptom, present in 56.6% of our patients. However, its distribution among H. pylori-positive and -negative patients was nearly equal ($p = 0.475$), indicating limited clinical utility for symptom-based diagnosis. Similar conclusions were drawn by studies in neighboring South Asian countries, where symptom-based screening proved inadequate for diagnosing H. pylori infection (22, 23). From a public health perspective, our findings reinforce the need for laboratory confirmation of H. pylori infection rather than relying solely on clinical symptoms. The use of the H. pylori stool antigen (HPSA) test in this study proved effective as a non-invasive diagnostic tool with reasonable sensitivity and specificity, which has also been validated in previous Pakistani studies (24). Despite the strengths of our study, such as adequate sample size and inclusion of both urban and rural populations, some limitations should be acknowledged. The cross-sectional design limits causal inferences, and confounding variables such as dietary habits and use of NSAIDs were not evaluated, which might have influenced the dyspeptic symptoms. In conclusion, while H. pylori remains highly prevalent among dyspeptic patients in Pakistan, its clinical presentation is heterogeneous and does not reliably correlate with specific symptoms or demographic factors. This underlines the importance of laboratory-based diagnosis and suggests the potential need for population-wide screening and eradication programs in high-burden settings.

Conclusion

This study found a high prevalence of Helicobacter pylori infection (68.3%) among patients with dyspepsia; however, no significant association was observed between H. pylori infection and demographic factors, duration of symptoms, or clinical features. These findings highlight the importance of laboratory confirmation over symptom-based

diagnosis in managing dyspeptic patients in high-burden settings like Pakistan.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-TBAD-22)
Consent for publication
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Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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