



The frequency of *Helicobacter pylori* in patients with functional dyspepsia

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Abstract: Background: *Helicobacter pylori* is a gram-negative bacteria which can cause peptic ulcer disease associated with dyspepsia. **Aim:** The aim of this study was to determine the frequency of *Helicobacter pylori* in patients with functional dyspepsia. **Materials and method:** The present cross-sectional study was conducted at the department of medicine and gastroenterology Bolan Medical Complex Hospital, Quetta from May 2025 to October 2025 after taking approval from the ethical committee of the hospital. Individuals of both gender and different age groups (18-60) years fulfilling Rome III criteria for functional dyspepsia were included. Upper endoscopy of each of the participant was done. Biopsy specimens were collected from macroscopic lesions on the antrum and corpus. Gram staining and the rapid urease test was done. Culturing for *H. pylori* was done on Skirrow's medium. Demographic data (age, gender, educational level, marital status) and symptom duration were collected. Statistical analysis was carried out using SPSS version 23. Continuous data (age, symptom duration) have been calculated as means (standard deviations), and categorical variables as frequencies/percentages. Chi-square tests were used to analyze associations between *H. pylori* positivity and demographic variables, with p-values < 0.05 signifying statistical significance. **Results:** In the current study a total of 79 individuals with functional dyspepsia were examined out of which male were 95(53.0%) and female were 84(46.9%). The mean duration of the symptoms of the disease 11.30 ± 7.53 months and the mean age of the study participants was 39.12 ± 8.10 years. Majority of the individuals had primary education 78(43.5%) and 56(31.2%) were illiterate. The frequency of *H. Pylori* infection was reported in 88(49.1%) of the study population. There were no significant relationships between *H. pylori* infection and age, education level, or marital status ($p > 0.05$). Male gender was shown to have a significant correlation with *H. pylori* positivity ($p = 0.026$). **Conclusion:** The present study concluded that patients with functional dyspepsia had high frequency of *Helicobacter pylori* infections (49.1%).

Keywords: Dyspepsia, *Helicobacter pylori*, Biopsy, culturing

INTRODUCTION

Dyspepsia, often known as indigestion, refers to a variety of diseases that can be diagnosed based on the patient's clinical history, physical examination, and laboratory results. Its major symptoms are burning pain, bloating, frequent belching, nausea, and feeling full before you finish eating. These symptoms typically occur quickly after meals and are commonly provoked by meals, stress, or drugs.¹ Dyspeptic patients have relapse or recurrence of peptic ulcers,

and during endoscopy, the ulcer may be absent, indicating *Helicobacter pylori* infection plus non-ulcer dyspepsia.² Dyspepsia is classified as either functional dyspepsia (FD) or organic dyspepsia based on the underlying cause of symptoms. Functional dyspepsia, also known as non-ulcer dyspepsia, is characterized by recurring or chronic upper abdomen discomfort or pain lasting a minimum of 3 months with signs present. In 25% of cases, there is no indication of an organic illness causing symptoms, including

biochemical, clinical, ultrasono-graphic or endoscopic findings.³ *Helicobacter pylori* (Hp) infection & functional dyspepsia are a common clinical concern in gastroenterology, although their relationship is ambiguous and debated.⁴ The incidence of *H. pylori* in functional dyspepsia is 87%, however it is unclear whether the symptoms are caused by corresponding findings or *H. pylori* infection.⁵ Previous trials on eradicating *H. pylori* for non-ulcer dyspepsia yielded inconsistent findings. However, several research found that eradication therapy improved symptoms in non-ulcer dyspepsia patients. Its therapy focuses on lowering stomach acid and increasing motility by lifestyle adjustments (eating proper food, avoiding trigger foods/smoking) & medicine, which includes analgesics, H₂ blockers, & Proton Pump Inhibitors.⁶⁻⁷ Early detection of *H. pylori* infections can prevent potentially fatal consequences. The present study was carried out to determine the frequency of *Helicobacter pylori* in patients with functional dyspepsia.

Materials and method

The present cross-sectional study was conducted at the department of medicine and gastroenterology Bolan Medical Complex Hospital, Quetta from May 2025 to October 2025 after taking approval from the ethical committee of the hospital. The sample size was determined through WHO calculator. The required sample size was 179. For data collection consecutive sampling method was used. Individuals of both gender and different age groups (18-60) years

fulfilling Rome III criteria for functional dyspepsia: such as early satiation, postprandial fullness and epigastric pain/burning for more than 6 months were included. Individuals who used PPI and antibiotics for *H. pylori* eradication within two weeks and hematemesis were excluded. Upper endoscopy of each of the participant was done by expert physicians of at least more than 5 years of experience. Biopsy specimens were collected from macroscopic lesions on the antrum and corpus. Gram staining (visualization of curved bacilli) and the rapid urease test was done to conform the infection of *Helicobacter pylori*. Culture (microaerobic incubation on selective agar for inconsistent results). This diagnostic approach did not include a formal histological examination using Haematoxylin and Eosin (H&E) or specific stains (such as Giemsa). Infection was determined as positive in ≥ 2 tests. Culturing for *H. pylori* was done on Skirrow's medium. The media was incubated for 3-10 days at 35-37°C, 5% O₂, 10% CO₂, and 85% N₂, in gas-controlled incubators. Demographic data (age, gender, educational level, marital status) and symptom duration were collected. Statistical analysis was carried out using SPSS version 23. Continuous data (age, symptom duration) have been calculated as means (standard deviations), and categorical variables as frequencies/percentages. Chi-square tests were used to analyze associations between *H. pylori* positivity and demographic variables, with p-values < 0.05 signifying statistical significance.

Results

In the current study a total of 79 individuals with functional dyspepsia were examined out of which male were 95(53.0%) and female were 84(46.9%). The mean duration of the symptoms of the disease 11.30 ± 7.53 months and the mean age of the study participants was 39.12 ± 8.10 years. Majority of the individuals had primary education 78(43.5%) and 56(31.2%) were illiterate. 140 (79.3%) people were married, 33 (18.4%) were not married, and 6 (3.3%) were divorced. as presented in table 1. The frequency of *H. Pylori* infection was reported in 88(49.1%) of the study population as presented in figure 1. Relationship between demographic characteristics and *H. pylori* positivity was evaluated. There were no significant relationships between *H. pylori* infection and age, education level, or marital status ($p > 0.05$). Male gender was shown to have a significant correlation with *H. pylori* positivity ($p = 0.026$) as presented in table 2.

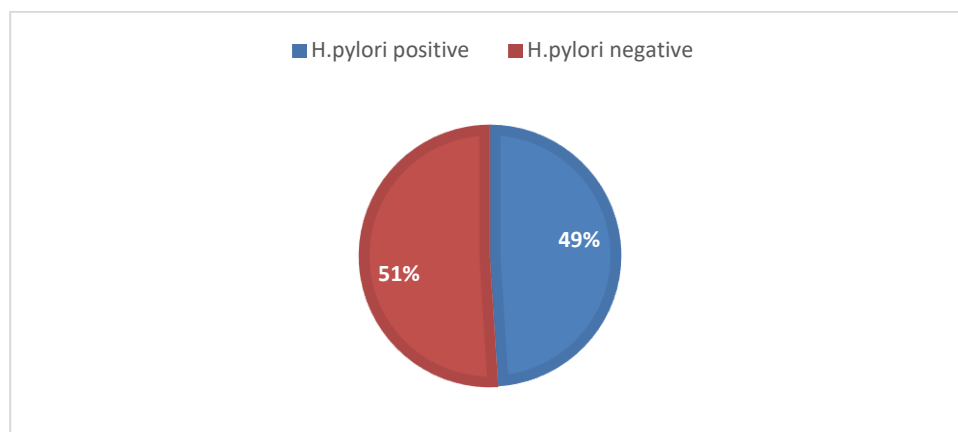


Table 1. Demographic features of the study participants n= 179	
Features	Mean / N (%)
Gender	
Male	95(53.0%)
Female	84(46.9%)
Mean Duration of symptoms	11.30 ± 7.53 months
Mean age	39.12 ± 8.10 (ranged 81-60) years
Marital Status	
Divorced	6(3.3%)
Married	140(79.3%)
Unmarried	33(18.4%)
Education status	
Higher Secondary	5(2.7%)
Secondary	40(22.3%)
Primary	78(43.5%)
Illiterate	56(31.2%)

Table 2. Relationship between demographic characteristics and H. pylori positivity			
Features	H. pylori positive	H. pylori negative	P value
Gender			
Male	55	40	0.026
Female	36	48	
Age groups			
18-39	51	40	0.107
40-60	40	48	
Marital Status			
Divorced	3	3	0.107
Married	74	66	
Unmarried	14	19	
Education status			
Higher Secondary	4	1	0.107
Secondary	18	22	
Primary	42	36	
Illiterate	28	28	

DISCUSSION

Helicobacter pylori, a Gram-negative bacterium found on the human intestinal mucosa, is a common chronic infection affecting approximately 50% of the world's population. 8 It can cause peptic ulcer disease (gastric and duodenal ulcers), gastric adenocarcinoma, and mucosa-associated lymphoid tissue (MALT) lymph.9 The disease is more prevalent in underdeveloped countries because to socioeconomic factors such as overcrowding, poor sanitation, polluted water sources, and limited healthcare access.10 In endemic locations, seroprevalence approaches 80% by adulthood, with childhood acquisition leading to lifetime colonization without intervention.11 Rome III criteria define functional dyspepsia as chronic or recurring upper abdomen pain (postprandial ampleness, quick satiety, epigastric aching/scorching) without structural pathology. This condition affects 10-40% of the

worldwide population. *H. pylori*'s function in the multifactorial pathophysiology of this condition, which includes visceral hypersensitivity, poor stomach accommodation, & duodenal inflammation, is still debated. Systematic evaluations show moderate clinical improvement after eradication, but population-level effect varies dramatically among epidemiological situations.11 Regional studies show significant variations in *H. pylori* prevalence among dyspeptic populations 31.2% in Iran11 and 50-51% in Pakistan's cities.13 The present study was carried out to determine the frequency of *Helicobacter pylori* in patients with functional dyspepsia. In the current study a total of 79 individuals with functional dyspepsia were examined out of which male were 95(53.0%) and female were 84(46.9%). 140 (79.3%) people were married, 33 (18.4%) were not married, and 6 (3.3%) were divorced our study demographic features are similar to the study conducted by Ali et al in which male gender was higher and majority of the

individuals were married which support our study.¹³ In our study the frequency of *H. Pylori* infection was 49.1%. Our study findings are similar to the study of Ali et al in which the prevalence was 50.89%.¹³ Previous Pakistani research found a frequency of 50-51% in urban areas, which is consistent with our findings.¹⁴ But the results of the current study are not comparable to the study of Awan, et al in their study the frequency was 64.4%.¹⁵ Poverty, inadequate sanitation, and contaminated water supplies have been identified as key transmission facilitators in developing economies, indicating widespread endemicity across regions.¹⁰ Our findings contrast with lower rates (31.2%) in Iran¹¹ and higher rates (75.6%) in Afghanistan¹⁶, demonstrating the impact of regional inequalities in public health infrastructure on infection burden. We performed histopathology/urease testing, while they employed stool antigen testing, which might explain the disparity in results. In our study males had considerably greater positivity for *H. pylori* compared to females ($p = 0.026$). Males in rural Pakistan often work in agricultural or labor-intensive jobs with high exposure to contaminated soil and water, which may contribute to gender skews in South Asian populations.¹⁷ Cultural norms may also delay seeking healthcare until infection is advanced.

The absence of relationships with age, education, or marital status shows that demographic characteristics other than gender have low effect on infection risk in this group. There were no significant relationships between *H. pylori* infection and age, education level, or marital status ($p > 0.05$) in our study. These findings are similar to the previous study.¹³ The 49% prevalence of *H. pylori* in functional dyspepsia patients in Pakistan highlights the need for frequent screening, especially in areas with limited endoscopic facilities. Our findings confirm the "test-and-treat" method recommended by Cochrane literature reviews¹⁸ for high prevalence ($>20\%$) locations. Empirical eradication can reduce long-term consequences such as peptic ulcers and stomach cancer, while also reducing dyspeptic symptoms. This strategy is useful in remote areas where limited diagnostic skills require cost-effective therapies.

Limitation of the study

Our study has several limitations; it was a single center study and did not examine the major cities. We had not used molecular methods to know about the genetics of *H. pylori*. Future multicenter studies should include molecular diagnostics (e.g., PCR) and socioeconomic characteristics to discover effective preventative methods.

CONCLUSION

The present study concluded that patients with

functional dyspepsia had high frequency of *Helicobacter pylori* infections (49.1%). The results support regular *H. pylori* screening in dyspepsia treatment procedures.

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