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Frequency of Helicobacter Pylori Positive Serology in Patients with Dyspepsia

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ABSTRACT

Objective: The purpose of this study is to quantify the number of patients with dyspepsia who test positive for Helicobacter pylori and to identify any correlations between this finding and clinical, risk factor, and lifestyle variables. **Study Design:** Cross-sectional study. **Place and Duration of Study:** Department of Medicine, Ittefaq Trust Hospital, Lahore, over a period of six months after approval of the research synopsis. **Methodology:** The study comprised 130 patients with dyspepsia, aged 16 to 75 years, selected by non-probability sequential selection. Standard clinical criteria were used to define dyspepsia. The following information was documented: demographics, clinical features, comorbidities, lifestyle variables, and the usage of proton pump inhibitors. H. pylori serology was evaluated by collecting venous blood samples and quantifying immunoglobulin M (IgM) levels; results more than 40 U/mL were deemed positive. We used SPSS version 25 to analyses the data. The chi-square test was used to evaluate relationships between factors and H. pylori serology, and descriptive statistics were computed. A p-value <0.05 was considered statistically significant. **Results:** The participants' average age was 45.39 ± 16.28 years, and slightly more than half of them were female (51.5%). *Helicobacter pylori* positive serology was found in 18 (13.8%) patients. The majority of patients had dyspeptic symptoms for more than 12 months (66.2%). No statistically significant association was observed between *H. pylori* seropositivity and age, gender, body mass index, duration of dyspepsia, medical comorbidities, family history, proton pump inhibitor use, lifestyle, or dietary habits (p>0.05). **Conclusion:** *Helicobacter pylori* positive serology was detected in a minority of dyspeptic patients, with no significant association with socio-demographic, clinical, or lifestyle factors. These findings support the multifactorial nature of dyspepsia and suggest that *H. pylori* infection alone may not be a primary determinant of dyspeptic symptoms. .

INTRODUCTION

Dyspepsia is a prevalent gastrointestinal disorder marked by persistent or recurring upper abdomen discomfort, encompassing epigastric pain, early satiety, postprandial fullness, and epigastric burning (1). It constitutes a considerable percentage of outpatient consultations and places a major strain on global healthcare systems (2). The global incidence of dyspepsia varies between 20% and 40%, with elevated rates observed in underdeveloped nations attributable to inadequate sanitation, overcrowding, and restricted access to healthcare services (3). Dyspeptic symptoms are among the most common grounds for medical consultation in South Asian populations (4).

There are several stomach infections caused by the spiral-shaped gram-negative bacterium Helicobacter pylori. These include gastric cancer, peptic ulcer disease, chronic gastritis, and mucosa-associated lymphoid tissue lymphoma. Infection with *H. pylori* induces chronic gastric inflammation, disrupts mucosal integrity, alters gastric acid secretion, and affects gastric motility and visceral sensitivity, all of which may contribute to dyspeptic symptoms(5, 6). Despite these associations, the exact role of *H. pylori* in dyspepsia remains controversial.

Functional dyspepsia, as defined by the Rome IV criteria, refers to the presence of dyspeptic symptoms without identifiable structural disease on routine clinical evaluation. The condition is multifactorial, involving abnormal gastric motility, visceral hypersensitivity, psychosocial factors, low-grade inflammation, and altered gut-brain interactions(7). *H. pylori* infection has been frequently detected in patients with functional dyspepsia, though causal relationships are not clearly established. Some patients report symptom improvement following eradication therapy, while others show no significant benefit(8, 9).

Epidemiological studies have demonstrated a higher prevalence of *H. pylori* infection among dyspeptic patients

compared to asymptomatic individuals. Data obtained using urea breath tests and serological assays suggest infection rates exceeding 60% in symptomatic populations in endemic regions (4). However, wide variability exists across studies due to differences in diagnostic methods, study populations, and geographic settings. Serological testing for *H. pylori*, particularly immunoglobulin M (IgM), offers a simple, non-invasive, and cost-effective tool for identifying recent or active infection, making it suitable for large-scale screening in resource-limited settings(10, 11).

The clinical relevance of *H. pylori*-positive serology in dyspeptic patients continues to be debated. While several randomized trials and meta-analyses have shown modest symptomatic improvement after eradication therapy, others report minimal or no benefit, particularly in functional dyspepsia(12, 13). This inconsistency highlights the need for population-specific data to guide evidence-based management strategies.

In Pakistan, *H. pylori* infection is highly prevalent due to socioeconomic and environmental factors, yet local data regarding its frequency in dyspeptic patients, particularly using serological methods, remain scarce. Limited regional studies and the absence of standardized screening protocols hinder effective clinical decision-making(14, 15). Therefore, determining the frequency of *H. pylori*-positive serology in patients presenting with dyspepsia is essential to assess the burden of infection in the local population and to inform appropriate diagnostic and therapeutic approaches.

METHODOLOGY

This cross-sectional study was conducted in the Department of Medicine, Ittefaq Trust Hospital, Lahore, over a period of six months after approval of the research synopsis. The purpose of the research was to find out how often patients presenting with dyspepsia tested positive for Helicobacter pylori.

The sample size was calculated using the WHO sample size calculator, taking the prevalence of *Helicobacter pylori* positive serology in dyspeptic patients as 14%, with a 95% confidence level and a margin of error of 6%. Based on these assumptions, a total sample size of 130 patients was required. A non-probability consecutive sampling technique was used to enroll eligible participants from the medical outpatient department.

Individuals of both sexes, aged 16 to 75 years, exhibiting symptoms of dyspepsia were incorporated into the research. Dyspepsia was operationally defined as the occurrence of postprandial fullness, early satiety, epigastric discomfort, or epigastric burning lasting over three months, without any indication of structural illness upon clinical assessment. Patients who had a documented *Helicobacter pylori* infection or eradication therapy within the preceding three months, those with known gastrointestinal malignancy or chronic peptic ulcer disease, and patients currently using antibiotics were excluded from the study.

After obtaining informed consent, detailed demographic and clinical information was recorded on a structured proforma. Data collected included age, gender, body mass index (BMI), duration of dyspepsia, history of proton pump inhibitor use, hypertension, diabetes mellitus, smoking, alcohol consumption, family history of *H. pylori* infection, family history of dyspepsia, dyslipidemia, occupation, lifestyle, and dietary habits.

A venous blood sample of 3 mL was drawn from each participant under aseptic conditions and sent to the hospital laboratory for serological analysis. *Helicobacter pylori* positive serology was determined by measuring immunoglobulin M (IgM) levels. An IgM level greater than 40 U/mL was considered positive, in accordance with the operational definition. Patients found to have positive serology were managed according to standard treatment protocols.

The data was entered and analyzed using SPSS version 25, the Statistical Package for the Social Sciences. Mean and standard deviation were used to represent quantitative data including age, BMI, and duration of dyspepsia, whereas frequencies and percentages were used to represent qualitative variables. Stratification was performed for potential effect modifiers, including age, gender, BMI, duration of dyspepsia, proton pump inhibitor use, smoking, alcohol consumption, and comorbid conditions. Post-stratification comparisons were made using the chi-square test. A p-value of less than 0.05 was considered statistically significant.

Ethical approval was obtained from the institutional review board before commencement of the study. Written informed consent was taken from all participants, and confidentiality of patient information was strictly maintained throughout the research process.

RESULT

A total of 130 dyspeptic individuals were recruited. The average age was 45.39 ± 16.28 years, with 51.5% of participants being female. The majority of subjects had a normal BMI (55.4%), with a mean BMI of 24.70 ± 3.61 kg/m^2. The duration of dyspepsia was mostly greater than 12 months (66.2%), with a mean symptom duration of 18.98 ± 10.64 months. Fifty-three point eight percent of individuals reported the usage of proton pump inhibitors (PPIs). In all, H. pylori serology yielded positive results in 18 individuals (13.8%) and negative results in 112 patients (86.2%). Stratified analysis revealed no socio-demographic, clinical, or lifestyle factors with a statistically significant connection to H. pylori seropositivity (all p>0.05).

Table 1

Socio-Demographic, Clinical, and Lifestyle Characteristics of Study Participants (n = 130)

Variable	Category	Frequency	Percent
Age Groups	16–35	41	31.5
	36–50	38	29.2
	51–65	19	14.6
	66–75	32	24.6
	Mean ± SD	45.39	16.28
Gender	Male	63	48.5
	Female	67	51.5
BMI Groups	Normal	72	55.4
	Overweight	49	37.7
	Obese	9	6.9
	Mean ± SD	24.70	3.61
Duration	< 3 months	5	3.8
	3-6 months	11	8.5
	7-12 months	28	21.5
	>12 months	86	66.2

	Mean ± SD	18.98	10.64
Medical History	None	42	32.3
	Diabetes	4	3.1
	Hypertension	7	5.4
	Smoking	29	22.3
	Hypertension + Diabetes	19	14.6
	Hypertension + Diabetes + Smoking	16	12.3
	Hypertension + Diabetes + Smoking + Alcohol	13	10.0
	No	29	22.3
Family History	H. pylori	38	29.2
	Dyspepsia	36	27.7
	Both	27	20.8
PPI Use	No	60	46.2
	Yes	70	53.8
Life style	Active	52	40.0
	Sedentary	29	22.3
	Exercise	49	37.7
Eating Habit	Home	40	30.8
	Fast Food	44	33.8
	Outside	46	35.4
H Pylori Serology	Negative	112	86.2
	Positive	18	13.8

This table summarizes the baseline profile of the sample. It shows the distribution of age groups (largest group 16–35 years: 31.5%), gender (female slightly higher than male), and BMI categories (majority normal BMI). It also reports duration of dyspepsia, highlighting that two-thirds had symptoms for more than 12 months, and describes comorbid/risk-history patterns (e.g., smoking and combined conditions). In addition, it presents lifestyle and dietary patterns and finally provides the key outcome: H. pylori serology positivity (13.8%) versus negativity (86.2%).

Table 2

Risk factors and frequency of H Pylori infection of Study Participants (n = 130)

Variable	Category	Frequency	Percent
Family History	H. pylori	38	29.2
	Dyspepsia	36	27.7
	Both	27	20.8
PPI Use	No	60	46.2
	Yes	70	53.8
Life style	Active	52	40.0
	Sedentary	29	22.3
	Exercise	49	37.7
Eating Habit	Home	40	30.8
	Fast Food	44	33.8
	Outside	46	35.4
H Pylori Serology	Negative	112	86.2
	Positive	18	13.8

This table focuses on selected exposures considered "risk factors" (family history, PPI use, lifestyle activity pattern, and eating habits) alongside the overall frequency of H. pylori serology positivity (13.8%). It essentially extracts the most relevant predictors from Table 1 to present them in a more clinically focused way for quick interpretation of risk distribution in the cohort.

Table 3

Association of Socio-Demographic, Clinical, and Lifestyle Factors with H. pylori Serology (n = 130)

Variable	Category	H. pylori Negative	H. pylori Positive	p-value
Age Groups	16–35	31 (27.7)	10 (55.6)	0.080
	36–50	36 (32.1)	2 (11.1)	
	51–65	16 (14.3)	3 (16.7)	
	66–75	29 (25.9)	3 (16.7)	
Gender	Male	57 (50.9)	6 (33.3)	0.166
	Female	55 (49.1)	12 (66.7)	
BMI Groups	Normal	63 (56.3)	9 (50.0)	0.811
	Overweight	41 (36.6)	8 (44.4)	
	Obese	8 (7.1)	1 (5.6)	
Duration	<3 months	4 (3.6)	1 (5.6)	0.946
	3–6 months	10 (8.9)	1 (5.6)	
	7–12 months	24 (21.4)	4 (22.2)	
	>12 months	74 (66.1)	12 (66.7)	
Medical History	None	35 (31.3)	7 (38.9)	0.694
	Diabetes	3 (2.7)	1 (5.6)	
	Hypertension	7 (6.3)	0 (0.0)	
	Smoking	27 (24.1)	2 (11.1)	
	HTN + Diabetes	15 (13.4)	4 (22.2)	
	HTN + Diabetes + Smoking	14 (12.5)	2 (11.1)	
	HTN + Diabetes + Smoking + Alcohol	11 (9.8)	2 (11.1)	
Family History	No	25 (22.3)	4 (22.2)	0.539
	H. pylori	34 (30.4)	4 (22.2)	
	Dyspepsia	32 (28.6)	4 (22.2)	
	Both	21 (18.8)	6 (33.3)	
PPI Use	No	51 (45.5)	9 (50.0)	0.724
	Yes	61 (54.5)	9 (50.0)	
Life style	Active	43 (38.4)	9 (50.0)	0.426
	Sedentary	27 (24.1)	2 (11.1)	
	Exercise	42 (37.5)	7 (38.9)	
Eating Habit	Home	33 (29.5)	7 (38.9)	0.705
	Fast Food	39 (34.8)	5 (27.8)	
	Outside	40 (35.7)	6 (33.3)	

This table is the inferential/comparative table. It cross-tabulates each variable (age, gender, BMI, duration, medical history, family history, PPI use, lifestyle, and eating habits) against H. pylori negative vs positive groups and reports p-values (Chi-square). Although some categories appear numerically different (e.g., higher positivity proportion in 16–35 years), the p-values show that none of these differences reached statistical significance (e.g., age p=0.080, gender p=0.166, BMI p=0.811, duration p=0.946, and others all >0.05). This supports the conclusion that H. pylori seropositivity was not significantly associated with the measured factors in this sample.

DISCUSSION

This study assessed the frequency of Helicobacter pylori positive serology among patients presenting with dyspepsia and evaluated its association with socio-demographic, clinical, and lifestyle factors. The findings demonstrate that H. pylori seropositivity was present in 13.8% of dyspeptic patients, while the majority (86.2%) were seronegative. No statistically significant association was observed between *H. pylori* serology and age, gender, body mass index, duration of dyspepsia, medical comorbidities, family history, proton pump inhibitor use, lifestyle, or dietary habits.

The observed frequency of *H. pylori* seropositivity in the present study is comparatively lower than that reported in many international and regional studies. Global literature suggests that *H. pylori* infection rates among dyspeptic patients often exceed 40–60%, particularly in developing countries where socioeconomic and hygienic conditions facilitate transmission(1, 3). However, lower prevalence rates have also been reported in studies using serological markers, especially immunoglobulin M, which reflects recent or acute

infection rather than chronic colonization(10). This methodological difference may partly explain the relatively lower frequency observed in the current study.

Several studies have highlighted that serological testing, while non-invasive and cost-effective, may underestimate overall *H. pylori* burden when compared to urea breath tests or stool antigen assays(11, 16). IgM antibodies typically decline after the acute phase of infection, and chronic infections may be better detected by IgG-based assays or non-serological tests. Nonetheless, serology remains useful in resource-limited settings, particularly for screening purposes, which aligns with the context of the present study.

In this cohort, *H. pylori* seropositivity did not show a significant association with age or gender. Although a higher proportion of seropositive cases was observed among younger adults (16–35 years), the difference was not statistically significant. Similar findings have been reported by Ford et al. and Lacy et al., who noted that demographic variables alone are weak predictors of H. pylori-associated dyspepsia(4, 17). Conversely, some regional studies have demonstrated higher prevalence among older age groups, reflecting cumulative exposure over time.[9] These discrepancies highlight the influence of population characteristics and diagnostic methods.

Body mass index and duration of dyspeptic symptoms were also not significantly associated with *H. pylori* seropositivity in this study. The majority of patients had long-standing symptoms exceeding 12 months, suggesting a predominance of functional dyspepsia rather than infection-driven disease. This observation supports the Rome IV framework, which emphasizes that functional dyspepsia is multifactorial and often persists independent of identifiable organic pathology(7).

Medical comorbidities, including diabetes, hypertension, smoking, and alcohol use, did not demonstrate a significant relationship with *H. pylori* serology. While smoking has been proposed as a risk factor for *H. pylori* infection due to impaired gastric mucosal defense, evidence remains inconsistent(9, 13). Similarly, the absence of association with proton pump inhibitor use in this study aligns with previous reports indicating that PPI exposure may alter bacterial load but does not reliably predict serological status(8).

Family history of *H. pylori* infection or dyspepsia was also not significantly associated with seropositivity. Although intrafamilial transmission of *H. pylori* has been documented, particularly in childhood, adult dyspeptic populations may reflect more complex interactions between environmental exposure, host factors, and gut-brain mechanisms(5, 6).

The lack of statistically significant associations across multiple variables suggests that *H. pylori* seropositivity alone may not be a dominant determinant of dyspeptic symptoms in this population. This finding is consistent with several randomized trials and meta-analyses showing only modest symptomatic improvement following eradication therapy in functional dyspepsia (12, 18). Consequently, routine eradication strategies based solely on dyspeptic symptoms may not be universally justified, especially in low-sero prevalence settings.

From a clinical perspective, the findings emphasize the importance of a comprehensive approach to dyspepsia management, incorporating symptom-based evaluation, psychosocial assessment, and selective use of diagnostic tests. While H. pylori screening remains relevant, particularly for preventing long-term complications such as peptic ulcer disease and gastric cancer, its role in symptom resolution appears limited in a substantial proportion of patients.

The use of IgM-based serology may have underestimated chronic *H. pylori* infection. The single-center design and relatively small sample size may limit generalizability. Additionally, endoscopic evaluation and alternative diagnostic modalities were not employed. Despite these limitations, the study provides valuable local data addressing an important gap in Pakistani literature. *H. pylori* positive serology was present in a minority of dyspeptic patients, and no significant association was found with socio-demographic, clinical, or lifestyle factors. These findings support the concept that dyspepsia, particularly functional dyspepsia, is a multifactorial disorder in which H. pylori plays a limited role. Larger, multicenter studies using multiple diagnostic modalities are recommended to further clarify the relationship between *H. pylori* infection and dyspepsia in the local population.

CONCLUSION

This study demonstrates that *Helicobacter pylori* positive serology was present in a relatively small proportion of patients presenting with dyspepsia. No statistically significant association was observed between *H. pylori* seropositivity and socio-demographic characteristics, clinical variables, or lifestyle factors. These findings suggest that dyspepsia, particularly functional dyspepsia, is a multifactorial condition in which *H. pylori* infection alone may not play a dominant role in symptom manifestation. While screening for *H. pylori* remains important to prevent long-term complications, management of dyspepsia should adopt a comprehensive, patient-centered approach rather than relying solely on serological status. Larger, multicenter studies using multiple diagnostic modalities are recommended to further clarify the role of *H. pylori* in dyspeptic populations and to guide evidence-based clinical practice.

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