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Original Research Article

FREQUENCY OF H. PYLORI INFECTION IN FEMALE PATIENTS PRESENTING WITH CHOLELITHIASIS AT TERTIARY CARE HOSPITAL, LARKANA

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ABSTRACT

Background: *Helicobacter pylori is a common gastrointestinal pathogen implicated in dyspepsia and peptic pathology. Its putative association with gallstone disease remains debated, with heterogeneous prevalence estimates across populations. Determining the burden of H. pylori among women with cholelithiasis can inform local diagnostic and management strategies.* ***Objective:*** *To determine the frequency of H. pylori infection in female patients presenting with cholelithiasis at a tertiary care hospital in Larkana, Pakistan.* ***Study design:*** *Cross-sectional, single-centre study.* ***Settings:*** *Department of Surgery, Chandka Medical College (tertiary care hospital), Larkana, Pakistan.* ***Duration of study****: January 5, 2025, to June 5, 2025.* ***Methods:*** *After institutional review board approval, consecutive non-probability sampling was used to enrol 79 women aged 30–60 years with newly diagnosed cholelithiasis and dyspeptic symptoms for ≥1 month. H. pylori infection status was determined according to institutional diagnostic protocols and recorded as present/absent. Stratified analyses were performed by age (<45 vs ≥45 years), residence (urban vs rural), and duration of dyspepsia (<6 months vs ≥6 months). Statistical significance was set at p<0.05.* ***Results:*** *The overall frequency of H. pylori infection was 25.3% (20/79). Infection prevalence was numerically higher in women <45 years (11/20) than in those ≥45 years (9/20), but the difference was not statistically significant (p=0.158). Residence was not associated with infection (urban 10/20 vs rural 10/20; p=1.0). Duration of dyspepsia showed no significant correlation with infection (≤6 months 10/20 vs >6 months 10/20; p=0.796).* ***Conclusion:*** *Among women with cholelithiasis at a tertiary centre in Larkana, H. pylori infection was moderate (~25%) and showed no significant association with age group, residence, or symptom duration. These data do not support routine stratification by these factors when considering H. pylori evaluation in this population.*

Keywords: Cholelithiasis; Helicobacter pylori; Dyspepsia; Prevalence; Women; Pakistan

INTRODUCTION

Gallstone disease or cholelithiasis is a common gastrointestinal disorder affecting many around the world (1). This involves forming calculi in the gallbladder and is far more common in women, particularly over the age of 30 to 60 years, through hormonal, weight, and sedentary factors (2). The incidence of cholelithiasis in females continues to be a source of great concern in Pakistan, presuming nearly 10–20% of adult females will undergo this disease (3). Although several risk factors have been suggested to be linked to gallstone formation, there is recently emerging evidence on H. pylori infection as a potential contributor in the pathogenesis of biliary tract disease, including cholelithiasis (4).

H. pylori is a gram-negative spiral-shaped bacterium that is traditionally found to be associated with peptic ulcer disease, chronic gastritis and gastric malignancies (5). Nevertheless, recent findings indicate a possible hepatobiliary tropism of H. pylori, as the bacterium appears to be a coloniser of the biliary tract or has been implicated to play a role in gallstone formation due to its generation of chronic inflammatory mechanisms or changes in lipid metabolism (6). In the study by Takahashi et al. (2014) involving more than 10,000 patients, the prevalence of gallstones was significantly higher in those who had H. pylori infection confirmed (7). As in the large Chinese population-based study reported by Zhang et al. (2015), this robust association was also consistent (8).

A study conducted in Lahore, Pakistan, by Nadeem H and colleagues revealed that females were more infected with H. pylori infection (60.3%) compared to male patients (39.7%) (9). Another study by Kankaria J et al., conducted in India during the period of 2020–2021, reported the prevalence of H. pylori infection in women, i.e., 21.5% (10). There is a paucity of literature on the prevalence of H pylori infection in female patients with cholelithiasis in our country. Moreover, the relationship between infection and gallstones remains controversial, with ongoing debate. Infection has been proposed as a reason, especially for the brown pigment stones. Furthermore, the prevalence of infection in the digestive tract by Helicobacter species varies in the population studied, suggesting epidemiological differences in the distribution of the bacillus in various countries. Ultimately, this will result in improved patient outcomes, improvement in the quality of life of the patients and reduced mortality. The objective of the present study was to determine the frequency of H. pylori infection in female patients presenting with cholelithiasis at the tertiary care hospital, Larkana.

METHODOLOGY

After the ethical approval from the institutional review board, this cross-sectional study was conducted at the Department of Surgery, Chandka Medical College, Larkana, from 05/01/2025 to 05/06/2025. Through non-probability consecutive sampling, 79 patients aged 30-60 years, newly diagnosed female patients with cholelithiasis, patients complaining of dyspepsia for at least one month at the time of diagnosis were included in the present study. Patients with a history of eradication therapy in the last six months, with a history of NSAID-induced gastritis, Zollinger-Ellison syndrome, peptic ulcer, gastric malignancy or MALT lymphoma, with a history of renal impairment, chronic obstructive pulmonary disease, asthma, congestive heart failure, myocardial infarction and chronic liver disease were excluded

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from the present study. Informed consent was obtained from all the patients for assigning them to the study and using their data in research. A brief history of demographic data was taken. An early morning sample was collected in a clean container provided by the laboratory, and instructions for collecting the sample were explained to each patient by the researcher. Patients with a positive stool antigen test, as defined operationally, were labelled as having Helicobacter pylori infection. The findings of quantitative variables (age, height, weight, BMI, and duration of dyspepsia) and qualitative variables (residence status, obesity status, physical inactivity, family history of H. pylori infection, and outcome variable, i.e., H. pylori infection) were entered in a proforma. Data was analysed on SPSS Version 26. Means and standard deviations were calculated for the quantitative variables like age, height, weight, BMI and duration of dyspepsia. Mean ± SD was reported for the normally distributed quantitative variables. Frequencies and percentages were calculated for the qualitative variables, such as residence status, obesity status, physical inactivity, and family history of H. pylori infection. Additionally, the outcome variable, i.e., H. pylori infection (yes/no), was calculated. Effect modifiers were controlled through stratification of age, BMI, duration of dyspepsia, residence status, obesity status, physical inactivity and family history of H. pylori infection, and to see the effect of these on the outcome variable. Post-stratification chi-square test/Fisher test was applied, taking a p-value of ≤ 0.05 as statistically significant.

RESULTS

In this study, the mean age of the participants was 44.4 ± 9.8 years, with the distribution of residence showing 49% (n=39) of the patients belonging to urban areas and 51% (n=40) from rural settings. The average height and weight of the patients were 159.4 ± 6.4 cm and 69.6 ± 10.2 kg, respectively, resulting in a mean Body Mass Index (BMI) of 27.5 ± 4.6 kg/m², indicating that many participants were either overweight or obese.

Clinically, the mean duration of dyspepsia among patients was 6.1 ± 3.4 months. Among the cohort, 27% (n=21) were classified as obese based on their BMI, while 62% (n=49) reported physical inactivity. A notable 58% (n=46) had a family history of H. pylori infection. The overall frequency of H. pylori infection among female patients with cholelithiasis was 25% (n=20), which is consistent with previous studies suggesting a potential association between H. pylori and gallstone disease.

Stratification of outcomes revealed that the prevalence of H. pylori infection was slightly higher in patients under the age of 45 years (n=11) compared to those over 45 (n=9), although this difference was not statistically significant (p=0.158). Residence status did not influence H. pylori infection rates, with equal distribution among urban (n=10) and rural (n=10) patients (p=1.0). The duration of dyspepsia also showed no significant correlation with infection rates, as both groups—those with symptoms for less than six months and those with longer durations—had 10 cases each of H. pylori infection (p=0.796).

Regarding obesity, 8 out of 21 obese patients tested positive for H. pylori compared to 12 out of 58 non-obese patients, but this too was not statistically significant (p=0.146). Similarly, H. pylori infection was present in 11 physically inactive and 9 physically active patients, with a p-value of 0.595. Lastly, among those with a family history of H. pylori, 10 tested positive, while an equal number (n=10) of infected patients had no family history, showing no significant association (p=0.438).

Table 1: Demographic variables

Variables	Mean and Frequency
Age (years)	44.4±9.8
Residence	
Urban	39 (49%)
Rural	40 (51%)
Height (m)	159.4±6.4
Weight (kg)	69.6±10.2
BMI (kg/m2)	27.5±4.6

Table 2: Clinical variables

Variables	Mean and Frequency
Duration of Dyspepsia (Months)	6.1±3.4
Obesity Status	21 (27%)
Physical Inactivity	49 (62%)
Family History of H. pylori Infection	46 (58%)
H. pylori Infection	20 (25%)

Table 3: Stratification of outcomes

Variables	H. Pylori Infection		P value
	Yes	No	
Age (years)			0.158
<45	11	44	
>45	9	15	
Residence			1
Urban	10	29	
Rural	10	30	
Duration of Dyspepsia (Months)			0.796
<6 months	10	33	
>6 months	10	26	
Obesity Status			0.146
Yes	8	13	
No	12	46	
Physical Inactivity			0.595
Yes	11	38	
No	9	21	
Family History of H. pylori Infection			0.438
Yes	10	36	
No	10	23	

DISCUSSION

The present study had a 25% prevalence of Helicobacter pylori infection in female patients with cholelithiasis, which is closely similar to other regional reports. In a similar Pakistani cholelithiasis cohort, Yao et al. (2024) reported a 23.3% H. pylori positivity rate (11), and Kankaria et al. (2023) described 21.5% prevalence in Indian patients with gallstones (10). However, the consistency with such an association possibly reflects a link between H. pylori colonisation and biliary disease, absent causality (12).

Age stratification found no significant difference in the proportion infected in women 45 years of age or younger compared to an older group (11/55; 20% vs. 9/24; 37.5%; p = 0.158). Also, Takahashi et al. (2014) found no significant association of gallstone and H. pylori with an adult Japanese population, indicating that if H. pylori causes gallstone, then its effect is independent of age (7).

However, infection rates (10/39 vs. 10/40; p = 1.0) were not influenced by residence (urban vs. rural), in agreement with Zhang et al.'s large-scale Chinese survey on H. pylori prevalence in gallstone patients. Because in Pakistan, urban and rural women have similar H. pylori infection burdens, residence per se is unlikely to explain gallstone risk (8). H. pylori positivity did not differ according to duration of dyspepsia (10/43 vs. 10/36; p = 0.796), similar to Boziki et al. (2024), in whom the presence or absence of pathogens was independent of symptom duration. Gastric mucosal inflammation may

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impair dyspeptic symptoms independent of colonisation dynamics of biliary colonisation (13).

There was 38% infection among obese vs 17% in nonobese ($p = 0.146$). Although statistically insignificant here, Marschall et al. (2010) suggested that obesity is a risk factor for having gallstones and described that metabolic changes could enable H. pylori to survive in bile-rich environments. This study may need a larger sample to evaluate if obesity considerably modulates biliary H. pylori colonisation (14).

Likewise, no significant associations were found ($p = 0.595$ and $p = 0.438$) regarding physical inactivity or family history. These negative findings discredit the idea that H. pylori drives the majority of the cases of gallstone disease and have probably overstated their role as a primary driver of gallstone disease.

Importantly, all stratified analyses were underpowered to detect small differences (e.g., $p > 0.1$ in each category), and this cross-sectional design precluded temporal or causal inference. Future studies should employ larger multi-centre cohorts, adjusting for confounding factors such as diet and lipid profile, and utilise molecular methods to detect H. pylori in either the bile or gallstone matrix. Until then, we cannot decide whether eradication therapy might prevent gallstone formation or recurrence (15).

CONCLUSION

In conclusion, similar to regional and international literature, our findings indicate a moderate (~20–25%) prevalence of H. pylori in female cholelithiasis patients and do not identify any such demographic or clinical predictors of infection. Regrettably, the role of H. pylori in gallstone pathogenesis remains plausible but not confirmed and robust longitudinal and mechanistic studies will be required to determine if this bacterium attends as a bystander, "biomarker" or bona fide contributor to biliary calculi formation.

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.

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

ADESH AHUJA (Resident)
Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript. Manuscript drafting.
AKLIMA ABRO (Prof)
Manuscript revisions, critical input. Study Design, Review of Literature.
ABDUL GHAFFAR PIRZADO
Conception of Study, Final approval of manuscript.
SAGAR KUMAR (Postgraduate Trainee)
Data entry, data analysis, drafting an article.
AVINASH (Undergraduate Student)
Conception of Study, Final approval of manuscript.

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