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Original Research Article

Frequency of Gall Stones Among Patients With Helicobacter pylori Gastritis Presenting at a Tertiary Care Hospital

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Abstract: *Helicobacter pylori infection is a common gastrointestinal condition and has been implicated in various hepatobiliary disorders. Emerging evidence suggests a possible association between H. pylori gastritis and gallstone disease.* ***Objective:*** *To determine the frequency of gallstones among patients with Helicobacter pylori gastritis presenting at a tertiary care hospital.* ***Methods:*** *This study was conducted in 82 patients with H. pylori gastritis, diagnosed based on clinical symptoms and histopathological examination. Patients were assessed for the presence of gallstones. Diagnosis of gallstones was confirmed using abdominal ultrasonography based on reflective anterior echo, mobility, and posterior acoustic shadowing. SPSS 25 was used for data analysis. The chi-square test was used to stratify gallstones by demographics and comorbidities. A p-value ≤ 0.05 was considered significant.* ***Results:*** *The Mean age of the cohort in this study was 51.71 ± 15.21 years. Female patients were the majority, at 57.3%. Gallstones were observed in 31.7% of patients with H. pylori gastritis (n=26). A significant association was found between female gender and gallstones (P < 0.001). No statistically significant associations between gallstones and demographics or comorbidities were observed.* ***Conclusion:*** *A considerable proportion of patients with Helicobacter pylori gastritis had gallstones, 31.7% in the present study. Gallstones were associated with female gender, and a high proportion of patients with higher BMI had gallstones.*

Keywords: Helicobacter pylori, Gastritis, Gallstones, Cholelithiasis

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Introduction

Helicobacter pylori (H. pylori) is a bacterium with a spiral structure that inhabits the lining of the human stomach. It has a significant role in causing several gastrointestinal complications. The relationship between H. pylori gastritis and gallstone formation has been established through recent studies. At the same time, it is widely recognised that H. pylori is associated with gastritis and peptic ulcers. Gallstones are solid concretions formed in the gallbladder and can lead to substantial illness and pose a severe threat to one's health (1-4). Gaining a comprehensive appreciation of the intricate relationship between H. pylori infection and gallstone formation is of utmost importance to researchers (5). Gallstones can vary in size from minuscule particles to larger obstructive structures. A study reported the frequency of gallstones (8.3%) in cases of H. pylori gastritis (6).

Their development is a complex process that involves the equilibrium of many bile constituents, including cholesterol saturation and crystallisation. H. pylori-induced gastritis paves the way for changes in the gastrointestinal microenvironment. Persistent inflammation of the stomach mucosa can disrupt bile acid regulation (7, 8). Dysregulation of bile acids sometime induces alterations in bile composition that often create a favourable environment for gallstone formation. Bacteria's capacity to alter gastric acid production can influence gallbladder motility, thereby affecting bile flow and increasing patients' susceptibility to gallstone formation. Inflammation caused by H. pylori can result in variations in liver function that typically impact the composition of bile generated by the liver. These modifications could facilitate the formation of gallstones that contain higher levels of cholesterol (9-4).

The association between H. pylori gastritis and gallstones has important clinical implications. As no study has been conducted on this subject within our local population, this study aims to determine the frequency of gallstones among patients with H. pylori gastritis at our healthcare facility. The results of this study will assist our health professionals in understanding the bidirectional influence between these conditions, thereby introducing a new dimension to our comprehension of their pathophysiology. Recognising this intricate link has significant implications for both diagnostic strategies and therapeutic interventions, highlighting the need for collaborative efforts among healthcare practitioners to elucidate its complexities.

Methodology

This cross-sectional study was conducted in the Department of Surgery, Saidu Group of Teaching Hospital, Swat, commencing after obtaining ethical approval. The study duration was [29-09-2024 to 29-03-2025]. A consecutive non-probability sampling technique was used. The sample size was 82. This sample was determined using the previous frequency of gallstones in patients with Helicobacter pylori gastritis (8.3%), a 6% margin of error, and a 95% confidence level.

The study included both male and female patients aged between 18 and 70 years presenting with Helicobacter pylori gastritis. The Diagnosis of H. pylori gastritis was based on abdominal pain (< 4 VAS) and dyspepsia. The diagnosis was made based on gastric biopsy, with microscopic examination showing curved or spiral-shaped rods, mostly located within the mucus layer overlying gastric epithelial cells. To confirm gastritis, an inflammatory cell infiltrate in the gastric mucosa, including lymphocytes, plasma cells, and polymorphonuclear leukocytes, was observed on biopsy. Patients who were already receiving treatment for H. pylori infection or those with a known history of chronic renal or liver disease were excluded.

Consent was obtained from all patients. A pre-designed proforma was used to collect demographic details, including age, gender, BMI, educational status, profession, socioeconomic background, and place of residence. Diabetes and hypertension were also documented.

Each patient was assessed for gallstones. The following symptoms were observed for gallstones: sudden-onset pain in the right upper quadrant of

the abdomen (VAS > 6), high fever > 38.9°C, and chills. The presence of gallstones was confirmed by abdominal ultrasonography, showing a reflective echo from the anterior surface of the gallstone, mobility of the gallstones upon patient repositioning, and a marked posterior acoustic shadow. A consultant surgeon supervised the entire evaluation.

Data analysis was performed with SPSS 25. Mean and standard deviation were used for age and BMI. Gallstones, demographics and comorbidities were presented as frequency and percentages. The chi-square test was used to stratify gallstones by demographics and comorbidities, with a P-value threshold of ≤0.05.

Results

The mean age of 82 patients in this study was 51.71 ± 15.21 years. Their mean BMI was 26.51 ± 2.38 kg/m². Female patients were 57.3% (n=47) (Table 1). The frequency of gallstones was 31.7% (n=26) (Table 2).

A significant association with female gender was observed; most patients with gallstones were female (P < 0.001). No significant associations were found for other demographic variables. Similarly, body mass index showed no significant association with gallstones, but BMI > 24.9 kg/m² was observed in 80.8% of patients with gallstones (n=21). Comorbid conditions such as diabetes and hypertension were also not significantly associated with gallstones (Table 3).

Table 1: Demographics & comorbidities

Demographics & comorbidities		n	%
Gender	Male	35	42.7%
	Female	47	57.3%
Occupation status	Employed	36	43.9%
	Unemployed	46	56.1%
Area of residence	Urban	36	43.9%
	Rural	46	56.1%
Socioeconomic status	Low (> 50K)	20	24.4%
	Middle (50K to 100K)	51	62.2%
	High (> 100K)	11	13.4%
Education status	Educated	34	41.5%
	Uneducated	48	58.5%
Diabetes	Yes	11	13.4%
	No	71	86.6%
Hypertension	Yes	16	19.5%
	No	66	80.5%

Table 2: Frequency of gallstones

Gallstones	n	%
Yes	26	31.7%
No	56	68.3%

Table 3: Association of demographics and comorbidities with gallstones

Demographics & comorbidities		Gallstones				P value
		Yes		No		
		n	%	n	%	
Age distribution (Years)	18 to 35	4	15.4%	11	19.6%	0.84
	36 to 50	5	19.2%	12	21.4%	
	> 50	17	65.4%	33	58.9%	
Gender	Male	2	7.7%	33	58.9%	< 0.001
	Female	24	92.3%	23	41.1%	
BMI (Kg/m2)	18 to 24.9	5	19.2%	19	33.9%	0.17
	> 24.9	21	80.8%	37	66.1%	
Diabetes	Yes	4	15.4%	7	12.5%	0.72
	No	22	84.6%	49	87.5%	
Hypertension	Yes	4	15.4%	12	21.4%	0.52
	No	22	84.6%	44	78.6%	
Occupation status	Employed	11	42.3%	25	44.6%	0.84
	Unemployed	15	57.7%	31	55.4%	
Area of residence	Urban	10	38.5%	26	46.4%	0.49
	Rural	16	61.5%	30	53.6%	
Education status	Educated	10	38.5%	24	42.9%	0.70
	Uneducated	16	61.5%	32	57.1%	
Socioeconomic status	Low (> 50K)	8	30.8%	12	21.4%	0.45
	Middle (50K to 100K)	16	61.5%	35	62.5%	
	HIgh (> 100K)	2	7.7%	9	16.1%	

Discussion

The present study evaluated the frequency of gallstones among patients diagnosed with Helicobacter pylori gastritis and identified gallstones in 31.7% of the study population. This finding supports the growing body of evidence suggesting an association between H. pylori infection and gallstone disease. Previous studies have reported highly variable prevalence rates, reflecting differences in geographic distribution, diagnostic techniques, and study populations. A Pakistani study by Hussain et al. detected H. pylori positivity in gallbladder tissue in 25.6% of patients with cholelithiasis, suggesting potential biliary involvement by the organism (11). Conversely, a South Indian study by Hegde et al. reported no detection of H. pylori in gallbladder tissue despite a gastric infection rate of 20.4%, highlighting possible regional variations or methodological limitations in the detection of biliary colonisation (12).

Other regional and international studies have documented higher gastric H. pylori prevalence among patients with gallstone disease. Memon et al. reported a gastric H. pylori infection rate of 70.1% among symptomatic gallstone patients in Pakistan (13). In comparison, Shokry Shirvani et al. observed a prevalence of 43.1% among patients with gallbladder stones in Iran (14). The 31.7% gallstone frequency observed in the present cohort falls within this broad reported range, suggesting that local epidemiological, environmental, and host factors may influence the relationship between H. pylori infection and gallstone formation.

The demographic profile of the study population aligns further with the existing literature. The mean age of patients in this study was 51.71 years, which is comparable to the Iranian cohort reported by Shokry Shirvani et al., with a mean age of 51.8 years (14). Slightly lower mean ages were reported by Memon et al. in Pakistan and by Kerawala et al., who documented mean ages of 43.57 years and 40.83 years, respectively (13,15). The relatively higher mean age observed in the present study may be attributable to the tertiary care hospital setting, which commonly manages older patients with chronic gastrointestinal complaints.

Female predominance was observed in this study, consistent with previous reports demonstrating a higher burden of gallstone disease among women (11,13). Importantly, a statistically significant association was found between female gender and gallstone presence, reinforcing the well-established role of hormonal, metabolic, and reproductive factors in gallstone pathogenesis.

Body mass index analysis revealed a mean BMI of 26.51 kg/m², categorising most patients as overweight. Although 80.8% of patients with gallstones had a BMI above 24.9 kg/m², this association did not reach statistical significance. Hussain et al. previously reported a significantly higher frequency of gallbladder H. pylori positivity among obese individuals, suggesting a possible metabolic link (11). The lack of statistical significance in the present study may be due to the relatively small sample size, which limits statistical power. Nonetheless, obesity remains a plausible contributory factor that warrants further investigation in larger cohorts.

Regarding comorbid conditions, no significant association was identified between gallstones and diabetes mellitus or hypertension in the current study. This finding contrasts with some metabolic risk models of gallstone disease but is partially supported by Kerawala et al., who excluded diabetic patients altogether from their analysis (15). These observations suggest that within patients presenting specifically with H. pylori gastritis, metabolic comorbidities may not be the primary determinants of gallstone formation.

Socioeconomic status, profession, and area of residence were also not significantly associated with the presence of gallstones. While Memon et al. reported a predominance of rural residency among gallstone patients (13), the present study found that although 61.5% of gallstone cases were from rural areas, this did not translate into a statistically significant association. This indicates that rural residence may represent a common demographic characteristic in the study region rather than an independent risk factor for gallstones in patients with H. pylori gastritis.

Unlike many previous investigations that focused on detecting H. pylori in gallbladder tissue or assessing gastric infection among patients with gallstones, the present study uniquely quantified the burden of gallstones in a cohort with confirmed H. pylori gastritis. This approach provides clinically relevant insight into the coexistence of these conditions. It highlights the need for further prospective studies to clarify causality, underlying mechanisms, and potential implications for screening and management strategies.

Conclusion

In conclusion, this study found a substantial prevalence of gallstones (31.7%) among patients with H. pylori gastritis. The study also found that female gender was significantly associated with the presence of gallstones. Furthermore, although not statistically significant, this study found that patients with higher BMI had a higher frequency of gallstones.

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. (IRB)
Consent for publication
Approved
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Not applicable

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

MN (Postgraduate Residence)
Manuscript drafting, Study Design,
Review of Literature, Data entry, Data analysis, and drafting an article.
AUH (Professor)
Conception of Study, Development of Research Methodology Design
Study Design, manuscript review, and critical input.

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

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