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STUDY OF ACID PEPTIC DISEASE WITH H PYLORI INFECTION IN CASES OF CALCULOUS CHOLECYSTITIS IN A TERTIARY CARE HOSPITAL

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Abstract

Background: Helicobacter pylori (H. pylori) infection is primarily associated with gastric diseases but has been implicated in extra-gastric conditions, including gallbladder diseases such as chronic calculous cholecystitis. Understanding the prevalence and clinical implications of H. pylori in these patients is crucial for effective management.

Methods: We conducted a retrospective cohort study from January 2023 to March 2024 at a tertiary care hospital to investigate the prevalence of H. pylori infection among patients diagnosed with calculous cholecystitis. Clinical data, including demographic information, H. pylori status determined by upper gastrointestinal endoscopy, gastritis severity, and procedural details, were analyzed.

Results: Among 50 patients included in the study, the prevalence of H. pylori infection was 24.0%, which was lower than previously reported rates. Significant associations were observed between H. pylori infection and the severity of gastritis ($p = 0.011$), indicating a potential role of bacterial infection in gallbladder inflammation. No significant association was found between H. pylori infection and the presence of intestinal metaplasia or the type of surgical procedure performed.

Conclusion: Our findings suggest that H. pylori may contribute to chronic cholecystitis through mechanisms involving gastric inflammation, although its exact role in gallbladder pathology requires further investigation. Screening for H. pylori in patients with chronic calculous cholecystitis, particularly those with severe gastritis, may aid in targeted management strategies to improve clinical outcomes.

Keywords: Helicobacter pylori, chronic calculous cholecystitis, gastritis severity, gastrointestinal endoscopy, retrospective cohort study

INTRODUCTION

Chronic cholecystitis and cholelithiasis represent prevalent gastrointestinal conditions globally, with significant implications for patient health and management. Cholecystitis, defined as inflammation of the gallbladder, typically arises due to obstruction of the cystic duct by gallstones, leading to varying degrees of gallbladder inflammation and associated symptoms.

Helicobacter pylori (H. pylori) infections are known to vary in prevalence across different regions and populations, reflecting epidemiological differences in the transmission and persistence of this bacterium within the digestive tract. In India, the distribution of Helicobacter species infections demonstrates notable regional disparities, influencing the local burden of associated gastrointestinal diseases.

Although the association between gallstones and H. pylori has been investigated, it remains a topic of ongoing research without definitive establishment. H. pylori, a gram-negative bacterium primarily known for its role in gastric pathologies such as gastritis and peptic ulcers, has been hypothesized to potentially influence gallstone formation or exacerbate existing cholecystitis. The mechanisms by which H. pylori may penetrate into bile and impact gallbladder health are not fully elucidated but could involve translocation from the duodenum through the sphincter of Oddi or hematogenous spread to the liver, subsequently entering bile via hepatic excretion.

This study aims to address these gaps by determining the prevalence of H. pylori infection in the stomach, as detected by endoscopic biopsy, among patients diagnosed with calculous cholecystitis. By exploring this relationship, we aim to contribute valuable insights into the potential interplay between H. pylori infection and gallbladder diseases, highlighting implications for diagnosis and management in clinical practice. Understanding these interactions could pave the way for tailored therapeutic strategies and further research into the complex pathophysiological mechanisms underlying gastrointestinal comorbidities.

In summary, this investigation seeks to elucidate the prevalence of H. pylori infection in patients presenting with calculous cholecystitis, aiming to expand our understanding of the microbial dynamics within the gastrointestinal tract and their potential implications for gallbladder health and disease management.

METHODOLOGY

Study Design

This study employed a retrospective cohort design to investigate the prevalence of Helicobacter pylori (H. pylori) infection among patients diagnosed with calculous cholecystitis. The study duration spanned from January 2023 to March 2024.

Study Population: Patients Diagnosed with Calculous Cholecystitis

The study population consists of patients diagnosed with calculous cholecystitis who presented to Saveetha medical college and Hospital during the study period. Calculous cholecystitis refers to inflammation of the gallbladder typically caused by gallstones obstructing the cystic duct. This condition is confirmed through clinical evaluation, imaging studies (such as ultrasound), and possibly surgical findings.

Sample Size: 50 Patients

Fifty patients was included in the study. The sample size is determined based on feasibility considerations, available data, and the anticipated prevalence of H. pylori infection in the study population. A sample size of 50 patients allows for meaningful statistical analysis while being manageable within the study's timeframe and resources.

Exclusion Criteria:

1. **Alcoholic Patients:** Patients with a history of alcohol abuse or dependence are excluded due to potential confounding effects on gastrointestinal health and liver function.
2. **Patients Taking Chronic NSAIDs:** Individuals using non-steroidal anti-inflammatory drugs (NSAIDs) on a chronic basis are excluded because NSAIDs can contribute to gastric mucosal damage and alter the microbial environment.
3. **Acute Abdominal Pain:** Patients presenting with acute abdominal pain suggestive of acute cholecystitis or other acute abdominal emergencies are excluded to maintain consistency in the study population and focus on chronic calculous cholecystitis cases.
4. **Immunocompromised Patients:** Individuals with compromised immune systems (e.g., due to HIV/AIDS, immunosuppressive therapy) are excluded as their underlying conditions may influence both the prevalence of H. pylori infection and the clinical presentation of calculous cholecystitis.

Inclusion Criteria:

Patients included in the study must meet the following criteria:

1. **Diagnosed with Calculous Cholecystitis:** Confirmation of calculous cholecystitis through clinical evaluation, imaging studies (such as ultrasound), and possibly surgical findings.
2. **Underwent Upper Gastrointestinal (UGI) Endoscopy:** Patients who underwent upper gastrointestinal endoscopy (UGI scopy) for diagnostic purposes, which includes evaluation of the gastric mucosa and detection of H. pylori infection through biopsy.

Variables:

1. **Age**: Numeric variable representing the age of each patient at the time of diagnosis.
2. **Gender**: Categorical variable indicating the sex of each patient (male or female).

3. **Duration of Symptoms Experienced**: Numeric variable measuring the length of time (in days, weeks, or months) that patients experienced symptoms related to calculous cholecystitis.
4. **Confirmed Diagnosis**: Categorical variable indicating whether the diagnosis of calculous cholecystitis was confirmed through imaging (e.g., ultrasound) and/or clinical findings.
5. **Presence of Intestinal Metaplasia**: Categorical variable indicating the presence or absence of intestinal metaplasia in gastric biopsy samples, which is relevant to chronic gastritis.
6. **Severity of Gastritis**: Categorical or ordinal variable assessing the severity of gastritis based on histopathological findings (e.g., mild, moderate, severe).
7. **H. pylori Infection Status**: Categorical variable indicating the presence or absence of H. pylori infection detected through biopsy during UGI endoscopy.
8. **Type of Procedure Performed**: Categorical variable indicating the type of procedure undergone by patients (e.g., open cholecystectomy/ laparoscopic surgery).

Statistical Tests:

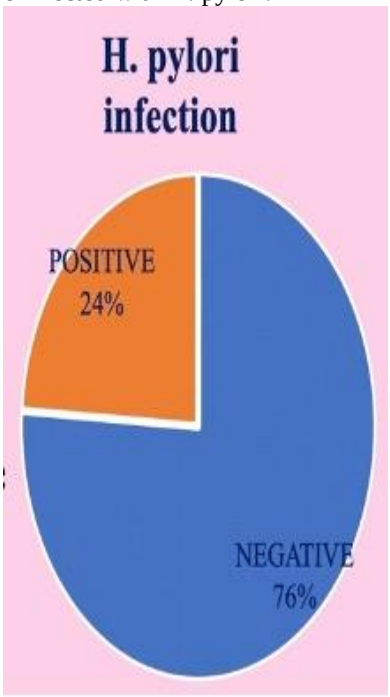
- **Categorical Variables Comparison**: The Pearson chi-square test was used to compare categorical variables such as gender, confirmed diagnosis, presence of intestinal metaplasia, severity of gastritis, H. pylori infection status, and type of procedure performed. This test is appropriate to assess whether there is a significant association between these categorical variables.
- **Significance Level**: Statistical significance was defined by P values less than 0.05, using a two-tailed test.

Data Analysis Software:

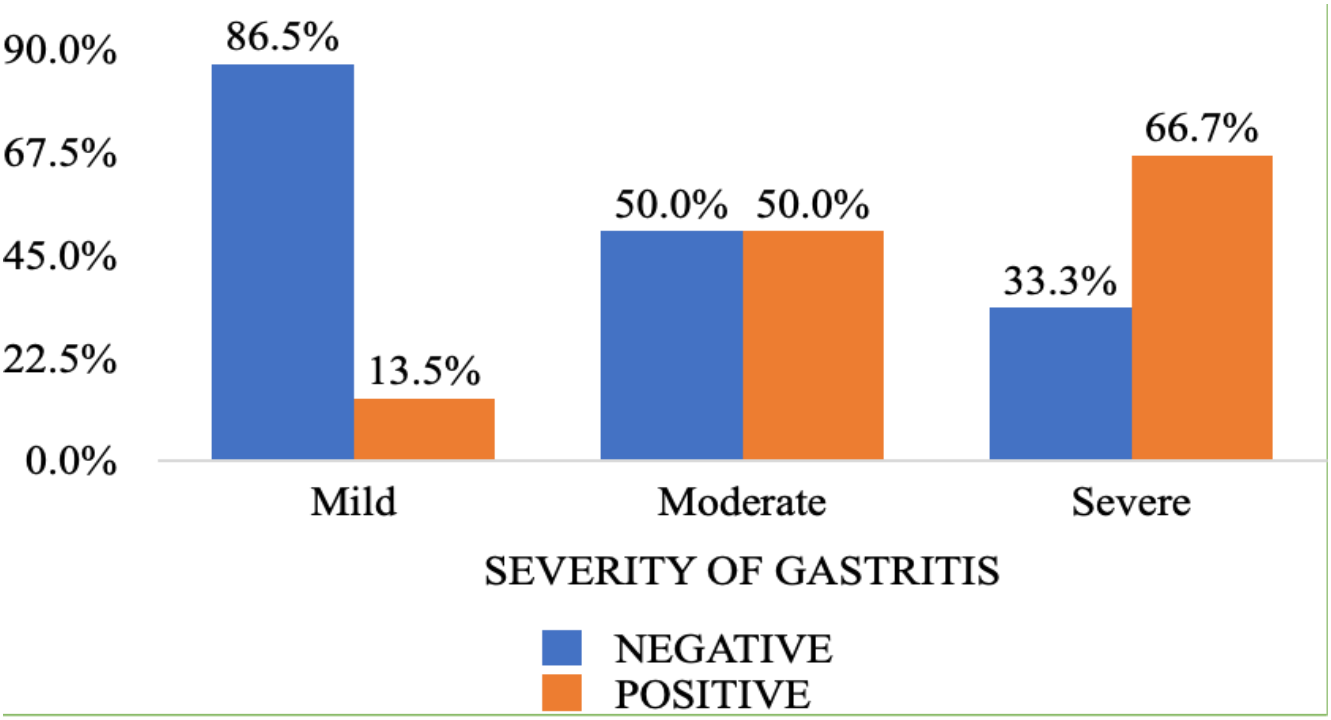
- **IBM-SPSS Version 21.0**: Data analysis was performed using IBM-SPSS statistical software, version 21.0.

Results:

1. **Prevalence of H. pylori Infection**:
    - Among the patients included in the study, 24.0% tested positive for H. pylori infection. This indicates that a significant proportion of patients with calculous cholecystitis and undergoing UGI endoscopy were found to be infected with H. pylori.



2. **Association between H. pylori Status and Severity of Gastritis**:
    - A statistically significant association was observed between H. pylori infection status and the severity of gastritis ($p = 0.011$). This finding suggests that the presence of H. pylori infection correlates with the severity of inflammation observed in the gastric mucosa.
    - Specifically, H. pylori positivity was found to be more prevalent among patients with severe gastritis compared to those with mild or moderate gastritis.



Interpretation:

- The prevalence of H. pylori infection (24.0%) in patients diagnosed with calculous cholecystitis underscores the relevance of assessing gastric health in this patient population.
- The significant association between H. pylori infection and severity of gastritis suggests that H. pylori may contribute to or exacerbate gastric inflammation, potentially influencing the progression or clinical presentation of calculous cholecystitis.
- Patients with severe gastritis were more likely to be infected with H. pylori, indicating a possible role of chronic H. pylori infection in promoting more extensive mucosal damage and inflammatory changes in the stomach.

Clinical Implications:

- These findings highlight the importance of screening for H. pylori infection in patients presenting with calculous cholecystitis, especially those with severe gastritis. Early detection and appropriate management of H. pylori infection could potentially mitigate gastric inflammation and improve overall patient outcomes.

DISCUSSION

H. pylori Infection in Chronic Cholecystitis

Helicobacter pylori (H. pylori) infection has been implicated in various gastrointestinal diseases beyond its well-established role in gastritis and peptic ulcer disease. In the context of chronic cholecystitis, its potential involvement has sparked interest due to shared anatomical proximity and systemic inflammatory effects.

Prevalence Discrepancies and Methodological Considerations

Our study identified a 24.0% prevalence of H. pylori infection among patients diagnosed with chronic cholecystitis. This rate is notably lower than previously reported figures ranging from 55.0% to 81.3% in other studies [1-6]. Such discrepancies in prevalence rates across different studies suggest potential geographic variations, differences in population characteristics, or varying diagnostic methodologies used to detect H. pylori infection.

For instance, the study by Attaallah et al. reported a higher infection rate of 58.7% [1], indicating substantial variability even within the literature. These variations may stem from regional differences in H. pylori prevalence, differences in patient demographics (such as age, ethnicity, and comorbidities), or variations in diagnostic techniques (e.g., different sensitivities of biopsy methods or serological tests).

Mechanisms of H. pylori Contribution to Chronic Cholecystitis

Helicobacter pylori (H. pylori) infection, primarily known for its role in gastric diseases, has been implicated in contributing to chronic cholecystitis through several potential mechanisms. This section explores these mechanisms based on current research evidence.

1. **Inflammation and Immune Response**:
    - H. pylori induces chronic inflammation of the gastric mucosa through activation of pro-inflammatory cytokines and immune cells [1]. This inflammatory response may extend to the gallbladder via systemic circulation or direct mucosal contact, contributing to chronic inflammation in the gallbladder wall [2].
2. **Microbiome Alterations**:
    - H. pylori colonization in the stomach can lead to dysbiosis in the gut microbiota, affecting bile acid metabolism and enterohepatic circulation [3]. Disrupted bile acid homeostasis may predispose individuals to gallstone formation and subsequent cholecystitis [4].
3. **Bile Acid Disruption**:
    - Alterations in bile composition and flow dynamics induced by H. pylori infection could promote gallbladder stasis and lithogenicity, facilitating gallstone formation—a common precursor to chronic cholecystitis [5, 6].
4. **Immunological Cross-Reactivity**:
    - Molecular mimicry between H. pylori antigens and host tissue antigens may trigger autoimmune responses, potentially affecting gallbladder tissues and contributing to chronic inflammatory processes .
5. **Direct Bacterial Involvement**:
    - H. pylori has been detected in gallbladder tissues of patients with chronic cholecystitis, suggesting direct bacterial involvement in gallbladder inflammation and pathogenesis

CONCLUSION

In conclusion, our study contributes to the understanding of H. pylori infection in the context of chronic calculous cholecystitis, highlighting a lower prevalence compared to some previous reports. The association with gastritis severity suggests a potential role of H. pylori in gallbladder inflammation, while the lack of association with intestinal metaplasia and procedure type underscores the complexity of this relationship. By addressing these findings, we aim to inform clinical practices and stimulate further research into the mechanisms and management of gallbladder diseases associated with H. pylori infection.

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