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COMPARISON OF ALT LEVEL WITH CHOLECYSTITIS AMONG PATIENTS AT IRFAN GENERAL HOSPITAL PESHAWAR

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Abstract

Background: *Helicobacter pylori* (*H. pylori*) remains a major global public health concern due to its strong association with gastrointestinal pathologies, including chronic gastritis, peptic ulcer disease, and gastric malignancies. Understanding the local demographic variations in infection patterns is critical for optimizing screening and therapeutic strategies. This study aimed to evaluate the prevalence of *H. pylori* infection and its distribution across different age and gender cohorts within the surveyed clinical population. Methodology: A cross-sectional analytical study was conducted utilizing a total cohort of 100 clinical samples collected during the study period. Diagnostic evaluations were performed to establish the presence or absence of *H. pylori* infection. Statistical and graphical

analyses were subsequently applied to evaluate gender-specific rates of infection, diagnostic age distributions, and the clinical presentation of cases in relation to gender and age cohorts. Results: Out of the 100 collected samples, a remarkably high prevalence was observed, with 85 cases testing positive for *H. pylori* and 15 cases testing negative. Gender-wise distribution among the 85 positive individuals revealed a significant male predominance, with males accounting for 60 cases (70.7%) compared to 25 cases (29.3%) in females. Age cohort analysis demonstrated that the highest concentration of infections occurred within the young-to-middle-adult demographic, with the 20 to 40 years age group representing 80% of the total cohort (comprising 54 males and 26 females). The 41 to 60 years category accounted for the remaining 20% (16 males and 4 females). Notably, male patients presented with infections at a relatively younger age than females (youngest male diagnosed at 21 years vs. youngest female at 26 years). Furthermore, within this younger demographic profile, infected males were found to experience *H. pylori* infections without co-existing peptic ulcer complications more frequently than females. Conclusion: This study demonstrates a high prevalence of *H. pylori* infection within the studied population, driven predominantly by younger individuals and males. The finding that younger males exhibit a higher frequency of infection without immediate peptic ulcer complications highlights a critical clinical window for early screening, tracking, and eradication interventions before severe structural gastric damage manifests. Future research using larger sample sizes is recommended to further characterize the socio-demographic and environmental drivers behind this male-centric, youth-skewed distribution.

Keywords: *Helicobacter pylori*, Prevalence, Gender Distribution, Age Cohort, Gastric Pathology, Peptic Ulcer.

Introduction

Cholecystitis in its varied forms is the most prevalent surgical entity afflicting populations of industrialized countries. The most common cause of cholecystitis and biliary colic is cholelithiasis. Autopsy findings show that 11% to 35% of American adults, or roughly 25 million people, have gallstones. Some 1% to 2% of people who have cholelithiasis develop symptoms or complications per year. These complications include biliary colic, acute or chronic cholecystitis, choledocholithiasis, cholangitis, pancreatitis,

and gallbladder carcinoma. It has been estimated that nearly 700,000 cholecystectomies are performed yearly in the United States. This article addresses the pathophysiology and clinical management of symptomatic cholelithiasis, acute calculous and acalculous cholecystitis, chronic cholecystitis, and complications of cholecystitis (Elwood *et al.,* 2008).

Gallstone disease is an ancient problem. Autopsies on Egyptian mummies have shown gallstones from at least 3500 years ago. Disorders of the gallbladder are the most common surgical diseases treated by a general surgeon. More than 700,000 cholecystectomies are performed in the United States every year, costing about 6.5 billion dollars. This situation makes gallbladder disease the most costly digestive disorder. This article focuses specifically on the pathophysiology, diagnosis, and treatment of acute cholecystitis (calculous and acalculous), as well as chronic cholecystitis (Knab *et al.*, 2014).

Acute cholecystitis—inflammation of the gall bladder—is most often caused by gall stones. Gall stones are one of the most common disorders of the gastrointestinal tract, affecting about 10% of people in Western society. More than 80% of people with gall stones are asymptomatic. Acute cholecystitis develops in 1-3% of patients with symptomatic gall stones.

Helminthic infection (ascariasis) is a major cause of biliary disease in developing countries in Asia, southern Africa, and Latin America.4 Obstruction of the cystic duct causes an inflammatory process to start. This results in acute cholecystitis. If the inflammation persists it may cause perforation or gangrene of the gall bladder (Indar *et al.,* 2002). Cholecystitis and its complications are pathologies commonly encountered in the emergency department (ED). Clinical findings and laboratory test results are often insufficient to confirm or exclude the diagnosis of cholecystitis. In more than one-third of patients with clinical suspicion for cholecystitis, a different etiology for upper abdominal pain is diagnosed on imaging, including right lower lobe pneumonia, pancreatitis, pyelonephritis, obstructive aeropathy, or hepatitis. Therefore, almost all patients with suspected cholecystitis require diagnostic imaging, including ultrasound (US), computed tomography (CT), or cholescintigraphy (HIDA). Cystic duct obstruction due to gallstones accounts for 80 to 95% of acute cholecystitis cases. In classic acute

calculous cholecystitis, prolonged cystic duct obstruction from gallstones leads to gallbladder lumen distention and thickening of the gallbladder wall due to submucosal edema. As these findings progress, complicated cholecystitis may result from increasing intraluminal pressure, mural inflammation, vascular compromise, hemorrhage, and gangrenous change, which may eventually lead to perforation. The recognized subtypes of complicated cholecystitis are hemorrhagic, gangrenous, and emphysematous cholecystitis, as well as gallbladder perforation (Maddu *et al.*, 2021).

Methodology

This cross-sectional study was conducted at Irfan General Hospital in Peshawar, KP, over a three-month period from April 2023 to June 2023. A sample size of 50 cholecystitis patients aged 20 years and above was selected based on specific selection criteria; inclusion required pre- and post-operative male and female cholecystitis patients with elevated alanine transaminase (ALT) levels, while individuals presenting with pancreatitis or gangrenous cholecystitis were explicitly excluded. Following proposal approval by the Undergraduate Research Committee of the Sarhad Institute of Allied Health Sciences and obtaining administrative consent, patients' ALT levels were evaluated. For subjects with ALT levels exceeding the normal reference range of up to 40 U/l, 3 ml of venous blood was collected into gel tubes using standard aseptic techniques with 70% isopropyl alcohol swabs. Samples were processed in the pathology laboratory by allowing the blood to clot in an incubator for 30 minutes, followed by centrifugation for 15 minutes at approximately 3000 rpm. The expressed serum was analyzed for ALT using a Microlab-300 auto-analyzer (Germany) and commercially available lab tech reagent kits operated according to the manufacturer's instructions. The automated analysis relied on the principle of the Beer-Lambert Law ($A = \epsilon Lc$), which states that the concentration (c) of an absorbing species and the light path length (L) are directly proportional to the absorbance (A) under a specific molar extinction coefficient (ϵ). The exact testing procedure involved zeroing the instrument with distilled water at a wavelength of 340 nm, a 1 cm light path cuvette, and a temperature of 37°C, before pipetting a mixture of 800 μL of Reagent 1 (R1), 200 μL of Reagent 2 (R2), and 100 μL of serum, with final absorbance read exactly 60 seconds after mixing. Confirmed automated results were documented using a structured proforma,

the data copies were cataloged with the laboratory head, and positive cases were formally referred for clinical treatment.

RESULTS

4.1. Prevalence of H. pylori Infection

During this study period, a total of 100 samples were collected. Out of these, 85 cases were found to be H. pylori Positive and 15 cases were H. pylori Negative, as presented in Table 4.1.

Patient Status	Count / Frequency
H. pylori Positive	85
H. pylori Negative	15
Total Patients	100

Table 4.1: *Total number of samples with positive and negative H. pylori*

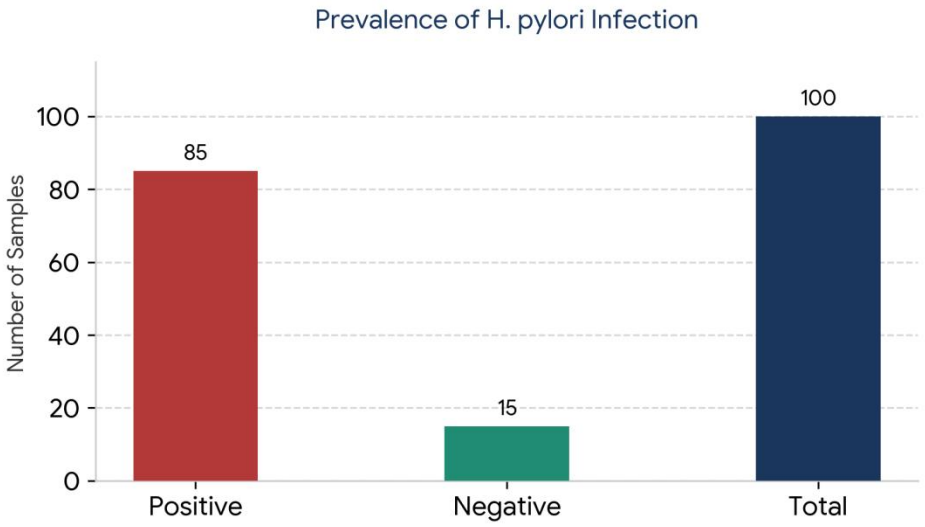

Fig. 4.1. Graphical representation of samples with or without H. pylori.

4.2. Gender-wise Distribution of H. pylori Infection

Out of the total 85 H. pylori positive patients, 60 (70.7%) were males and 25 (29.3%) were females, as detailed in Table 4.2 and Figure 4.2. The analytical data strongly indicates that the ratio of developing H. pylori infection was higher in males than in females.

Gender Categories (Valid Positive)	Frequency	Percent (%)	Valid Percent (%)
Male positive	60	70.7	70.7
Female positive	25	29.3	29.3

Table 4.2: *Gender wise distribution of patients having H. pylori.*

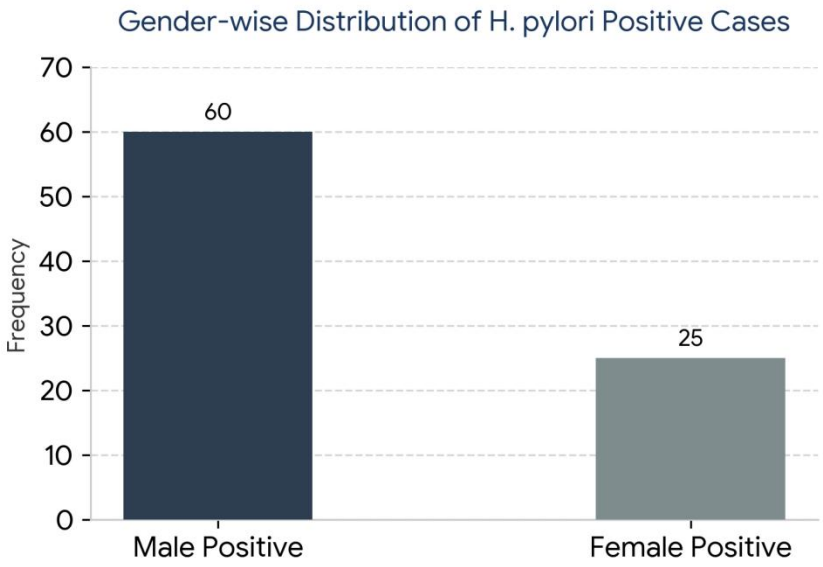

Fig. 4.2. Gender wise distribution of patients having H. pylori.

4.3. Age-wise Distribution of H. pylori Infection

Male patients who developed H. pylori infections were found to be relatively younger than female patients. In this study cohort, the youngest male patient diagnosed with H. pylori was 21 years old, whereas the youngest female patient was 26 years old. The highest concentration of H. pylori cases fell within the 20 to 40 years age group, representing 80% of the total cohort (70% of total sample population being males in this group), while the 41 to 60 years category accounted for 20%.

Age Cohort	Gender Breakdown	Total Cases	Cohort Percentage
20 to 40 years	Male: 54 Female: 26	80	70.7%

41 to 60 years	Male: 16 Female: 4	20	29.3%
Total Surveyed	Male: 70 Female: 30	100	100.0%

Table 4.3: *Age wise distribution of patients*

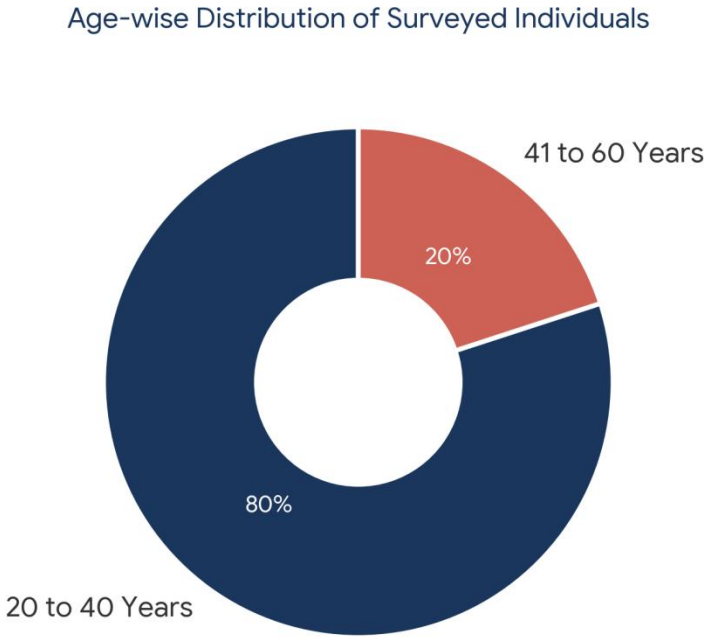

Fig. 4.3: Graphical representation of age wise distributed patients

Conclusions

In conclusion, patients presenting with H. pylori infections were predominantly younger individuals and more frequently males. Furthermore, cases of H. pylori without co-existing peptic ulcer complications were observed more frequently among men than women within this demographic profile.

This study investigated the prevalence and demographic distribution of Helicobacter pylori infection within a sample cohort of 100 patients. The empirical findings reveal a remarkably high prevalence of H. pylori infection, with 85% of the sampled population testing positive. The demographic analysis demonstrates significant disparities across gender and age distributions:

Gender Disparity: A pronounced male predominance was observed among the infected cases, with males accounting for 70.7% of the positive cohort compared to 29.3% for females. This strongly indicates that males within this population carry a significantly higher burden or risk of developing the infection.

Age Distribution: The infection predominantly clusters in younger demographics. The vast majority of cases (80%) were concentrated in the 20 to 40 years age group, with infected male patients tending to be younger (starting at age 21) than their female counterparts (starting at age 26).

Clinical Profiling: Furthermore, the study noted that cases of H. pylori presenting without active peptic ulcer complications were more frequently observed among men than women within this younger cohort.

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