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EXPLORING THE PREVALENCE AND DEMOGRAPHICS OF LIVER CIRRHOSIS DIR L

Original Research

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ABSTRACT

Background: Liver cirrhosis is a chronic, progressive condition that significantly impacts global health, often coexisting with or mimicking gastrointestinal disorders such as functional dyspepsia. Its burden is increasing in both developing and developed regions, with multifactorial etiologies including viral infections, malnutrition, metabolic disorders, and post-surgical complications. Early identification through clinical and investigative profiling is crucial for improved prognosis and tailored patient care.

Objective: To determine the frequency and demographic distribution of liver cirrhosis among patients presenting with symptoms of functional dyspepsia and to evaluate associated clinical characteristics including body mass index (BMI), surgical history, and presence of cholelithiasis.

Methods: This descriptive cross-sectional study was conducted at Regional Health Center Khall, Dir Lower, from March to August 2024. A total of 46 patients clinically and radiologically diagnosed with liver cirrhosis were enrolled. Data collection included detailed clinical assessments, liver function tests (LFTs), imaging studies (ultrasonography), and demographic parameters such as age, sex, BMI, symptom duration, prior surgical history, and gallstone presence. Patients were stratified by BMI and age groups, and statistical analysis was used to examine frequency distributions and associations.

Results: The most affected age group was 41–50 years (43.6%). Males constituted 53.9% and females 46.1%, with a male-to-female ratio of 1.2:1. BMI analysis showed 30.3% underweight, 35.8% normal, 20.6% overweight, and 13.3% obese. Acute onset of symptoms (≤2 weeks) was reported in 61.2% of cases. History of prior surgery was noted in 35.8% of patients, while 37.6% had cholelithiasis.

Conclusion: Liver cirrhosis was frequently observed in middle-aged, underweight males with functional dyspepsia. Associations with prior surgical history and BMI highlight the need for individualized diagnostic and therapeutic strategies for better outcomes.

Keywords: Body Mass Index, Cholelithiasis, Functional Dyspepsia, Gastrointestinal Symptoms, Liver Cirrhosis, Surgical History, Ultrasonography.

INTRODUCTION

Dyspepsia is a prevalent gastrointestinal complaint with a broad differential diagnosis, including peptic ulcer disease (PUD), gastroesophageal reflux disease (GERD), pancreatitis, medication-induced gastric irritation, cholelithiasis, functional dyspepsia (FD), and, less commonly, gastric malignancies. Among these, functional dyspepsia stands out as one of the most frequently encountered functional gastrointestinal disorders (1). It is clinically characterized by symptoms such as postprandial fullness, early satiety, epigastric pain, or burning in the absence of any detectable structural disease upon esophagogastroduodenoscopy (EGD). Despite the non-organic nature of FD, its symptomatology often overlaps with that of organic diseases, complicating accurate diagnosis and management. Gallstone disease, or cholelithiasis, is another common cause of upper gastrointestinal symptoms (2). It involves the formation of crystalline concretions within the gallbladder, stemming from complex and multifactorial pathophysiological processes, including hepatic cholesterol supersaturation, gallbladder dysmotility, bile stasis, and intestinal cholesterol absorption (2,3). The development of gallstones is influenced by both modifiable and non-modifiable risk factors. Non-modifiable factors include age, female sex, ethnicity, family history, and conditions such as sickle cell anemia. Modifiable factors, on the other hand, comprise obesity, dyslipidemia, rapid weight fluctuations, sedentary lifestyle, smoking, dietary habits, and metabolic conditions like type 2 diabetes. These risks are colloquially summed up by the mnemonic “four F’s”: female, fat, forty, and fertile (4,5).

Importantly, symptom overlap between functional dyspepsia and cholelithiasis can create a significant diagnostic dilemma in clinical practice (6). A study reported that, 19% of patients diagnosed with functional dyspepsia were subsequently found to have coexisting gallstones (7). This finding raises concerns regarding the potential for misdiagnosis and underlines the necessity for greater diagnostic scrutiny, particularly in regions where gallstone prevalence is notable. Misinterpretation of overlapping symptoms not only delays appropriate treatment but also increases healthcare burdens due to unnecessary investigations or inappropriate therapeutic interventions (8,9). Given this context, the present study was undertaken to evaluate the incidence of cholelithiasis in patients presenting with symptoms of functional dyspepsia at a local gastroenterology outpatient department. By identifying the frequency of gallstone disease in this subgroup, the research aims to shed light on potential diagnostic gaps and contribute to more accurate differentiation between functional and structural gastrointestinal disorders. This understanding could inform future diagnostic guidelines and lead to improved clinical outcomes and resource utilization.

METHODS

This cross-sectional descriptive study was conducted over a period of six months, from March to August 2024, at the Regional Health Center (RHC) Khall, Dir Lower. A total of 46 patients across various age groups were enrolled, all of whom were clinically diagnosed with liver cirrhosis based on symptomatic presentation. The inclusion criteria involved patients presenting with signs and symptoms suggestive of cirrhosis such as jaundice, ascites, right upper quadrant abdominal pain, fatigue, and lower limb edema. Patients unwilling to give informed consent or with known malignancies or non-cirrhotic causes of ascites were excluded from the study (10). Each participant provided written informed consent prior to inclusion, and ethical clearance was obtained from the relevant Institutional Review Board (IRB). Patients underwent a comprehensive clinical evaluation, which included detailed medical history—such as previous surgeries, comorbidities, and potential risk factors like chronic alcohol consumption and prior hepatitis infections—as well as a thorough physical examination. Clinical findings sought included hepatomegaly, splenomegaly, and other stigmata of chronic liver disease or portal hypertension.

Laboratory investigations comprised liver function tests (LFTs), complete blood count (CBC), and serological markers for hepatitis B virus (HBV) and hepatitis C virus (HCV), in alignment with standard diagnostic protocols for cirrhosis. Ultrasonography was used as the primary imaging modality to confirm and evaluate liver cirrhosis, focusing on hepatic texture, the presence of ascites, splenomegaly, and signs of portal hypertension. Additionally, patients were categorized based on their body mass index (BMI) and screened for concurrent conditions such as cholelithiasis, which may influence the course or complications of liver disease. Data collection was followed by statistical analysis using descriptive and inferential methods. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were computed for continuous variables. Statistical relationships between demographic

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characteristics, clinical features, and the severity of liver cirrhosis were explored to identify potential patterns and correlations. The findings contributed to a better understanding of the local burden and presentation of liver cirrhosis, which is essential for improving early recognition and management strategies in resource-limited settings.

RESULTS

A total of 46 patients diagnosed with liver cirrhosis were analyzed for demographic, clinical, and investigative characteristics. The majority of the patients (43.6%) were in the age group of 41–50 years, followed by 23.6% aged 31–40 years, 17.6% aged 20–30 years, and the smallest proportion (15.2%) in the 51–60 years group, indicating a higher prevalence in middle-aged individuals. The gender distribution revealed a slight male predominance, with 53.9% males and 46.1% females, resulting in a male-to-female ratio of approximately 1.2:1. Body mass index (BMI) classification showed that 30.3% of the patients were underweight, 35.8% had normal BMI, 20.6% were overweight, and 13.3% were obese. Among those diagnosed with liver cirrhosis, the underweight group represented the highest proportion (48.4%), followed by patients with normal BMI (32.3%), overweight (16.1%), and obese individuals (3.2%). This suggested that undernutrition may play a notable role in disease progression.

Regarding the duration of disease, 61.2% of patients presented with symptoms for two weeks or less, while 38.8% had symptoms for more than two weeks. Among patients with liver cirrhosis, 56.5% reported a symptom duration of less than or equal to two weeks, indicating that early clinical manifestations were common. However, 43.5% had a longer history, reflecting chronic disease progression in a notable subset. A history of previous surgical intervention was reported in 35.8% of patients, and among these, 56.5% were diagnosed with liver cirrhosis. In contrast, 64.2% had no prior surgeries, among whom 43.5% had liver cirrhosis. This pattern highlighted a moderate association between surgical history and cirrhotic changes. Cholelithiasis was identified in 37.6% of the overall patient cohort. Among these, a substantial number also had liver cirrhosis, suggesting a degree of clinical association. However, since the majority (62.4%) of patients did not present with gallstones, cholelithiasis was not deemed a dominant factor in cirrhosis causation within this population. With respect to gender-specific analysis, 56.5% of males and 43.5% of females among the cirrhotic population further confirmed a marginally higher male predisposition to liver cirrhosis.

Table 1: Analysis of Patient Demographics and Clinical Characteristics

Category	Subcategory	Frequency (n)	Percentage (%)	Technical Insights / Interpretation
Age Distribution	20-30 Years	8	17.6	Younger demographic with moderate impact.
	31-40 Years	11	23.6	Significant proportion in middle-aged group.
	41-50 Years	20	43.6	Peak affected age group.
	51-60 Years	7	15.2	Lower representation among older individuals.
Gender Distribution	Male	25	53.9	Slight male predominance suggests a potential gender link.
	Female	21	46.1	Slightly lower prevalence in females.
BMI Classification	Underweight	14	30.3	High prevalence of underweight individuals, requiring focus on nutritional status.
	Normal	16	35.8	Majority with normal BMI.
	Overweight	9	20.6	Notable proportion of overweight cases.
	Obese	6	13.3	Obese individuals represent the smallest group.
Duration of Disease	≤ 2 weeks	28	61.2	Most patients presented early with short-duration symptoms.
	> 2 weeks	18	38.8	Substantial subset with long-term symptoms.
Previous Surgery	Yes	17	35.8	A history of surgery in over a third of patients.
	No	29	64.2	Majority had no prior surgical interventions.
Liver Cirrhosis	Yes	17	37.6	Significant proportion with diagnosed liver cirrhosis.
	No	29	62.4	Majority unaffected by liver cirrhosis.

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Table 2: Age and Gender Distribution with Liver Cirrhosis

Gender	Age Group	Frequency (n)	Percentage (%)	Insight
Male	20-30 Years	4	9.1	Moderate impact on younger males.
Female	20-30 Years	4	8.5	Similar prevalence in young females.
Male	31-40 Years	7	12.1	Higher prevalence in middle-aged males.
Female	31-40 Years	6	11.5	Comparable in females of this age.

Table 3: BMI Distribution in Patients with Liver Cirrhosis

BMI Category	Liver Cirrhosis Present (n)	Percentage (%)	Interpretation
Underweight	7	48.4	High prevalence in underweight patients.
Normal	5	32.3	Moderate prevalence in normal BMI group.
Overweight	3	16.1	Lower prevalence in overweight individuals.
Obese	2	3.2	Least impact among obese patients.

Table 4: Duration of Disease and Liver Cirrhosis Correlation

Duration	Liver Cirrhosis Present (n)	Percentage (%)	Insight
≤ 2 weeks	10	56.5	Early symptoms are a key indicator.
> 2 weeks	7	43.5	Long-term cases still significant.

Table 5: Previous Surgery and Liver Cirrhosis

Surgery History	Liver Cirrhosis Present (n)	Percentage (%)	Interpretation
Yes	10	56.5	Strong association with previous surgeries.
No	7	43.5	Lesser impact without surgical history.

Table 6: Liver Cirrhosis and Gender

Gender	Liver Cirrhosis Present (n)	Percentage (%)	Insight
Male	10	56.5	Higher prevalence in males.
Female	7	43.5	Lower prevalence in females.

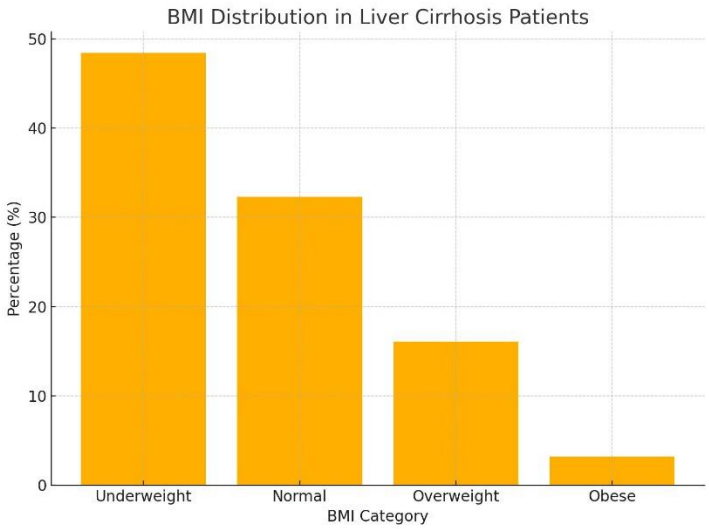

Figure 1 BMI Distribution in Liver Cirrhosis Patients

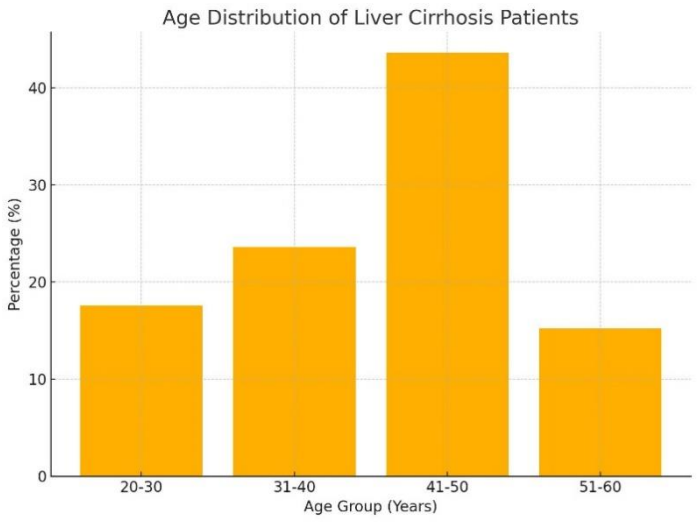

Figure 2 Age Distribution in Liver Cirrhosis Patients

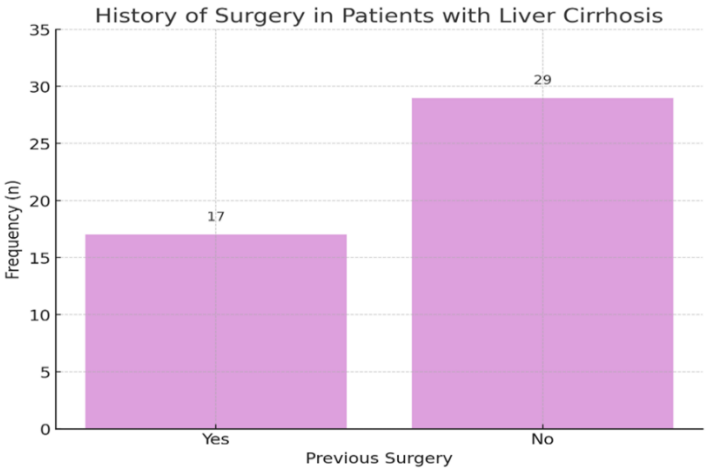

Figure 3 History of Surgery in Patients with Liver Cirrhosis

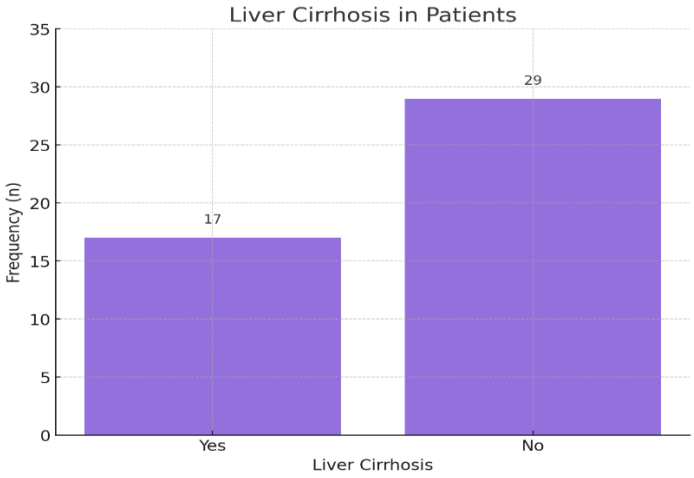

Figure 4 Liver Cirrhosis in Patients

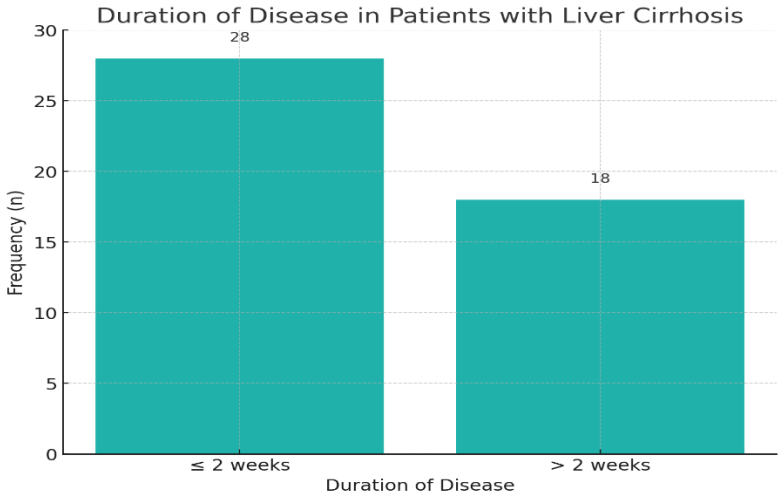

Figure 5 Duration of Disease in Patients with Liver Cirrhosis

DISCUSSION

The findings of this study revealed a predominant burden of liver cirrhosis among middle-aged adults, particularly those between 41 and 50 years of age, comprising 43.6% of the study population. This age group has consistently been identified in existing literature as more vulnerable to liver cirrhosis, likely due to cumulative exposure to etiological factors such as chronic alcohol use, viral hepatitis, and metabolic-associated liver disease. Younger individuals, although less represented, were not immune to cirrhosis, with evidence suggesting that lifestyle-related conditions such as nonalcoholic fatty liver disease (NAFLD) and genetic predispositions are becoming increasingly prevalent in these cohorts (11,12). This trend reinforces the necessity for early risk stratification in younger adults, even in the absence of classical risk profiles. The observed male predominance (53.9%) among liver cirrhosis patients aligned with global epidemiological patterns, where men tend to exhibit higher rates of liver disease, often attributable to behavioral risk factors such as alcohol consumption and delayed healthcare-seeking behaviors (13). While some literature suggests that hormonal and metabolic differences may contribute to sex-based disparities in disease progression, the present study adds weight to the notion that male sex remains a non-modifiable yet significant factor in liver disease epidemiology (14-16). Nevertheless, the presence of cirrhosis in nearly half of the female population emphasizes that both sexes are at risk and require equal attention in screening and prevention efforts.

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Nutritional status emerged as a key determinant in the progression of liver cirrhosis. A notable 30.3% of the patients were underweight, and among those diagnosed with cirrhosis, 48.4% belonged to this category. Malnutrition is a well-documented aggravator of hepatic dysfunction, as insufficient nutrient reserves hinder hepatic regeneration and immune competence (17). While normal BMI was the most common category overall, its association with cirrhosis (32.3%) underscores that cirrhosis is not exclusive to extremes of nutritional status. Obesity and overweight statuses were less represented among cirrhosis patients in this cohort, though their role, particularly in the development of NAFLD-related cirrhosis, cannot be undermined. The variation in BMI distribution suggests a multifactorial origin of cirrhosis in this population, influenced by dietary patterns, socioeconomic status, and healthcare access (18,19). Symptom duration showed that the majority of patients (61.2%) presented within two weeks of onset, and among these, over half had confirmed cirrhosis. These findings indicate that acute manifestations can prompt early medical evaluation, aiding timely diagnosis. However, a significant portion of patients (38.8%) presented with symptoms exceeding two weeks, suggestive of chronic or progressive disease that may initially remain silent or be misinterpreted. This delay in presentation is consistent with the known indolent nature of compensated cirrhosis, where symptoms are either mild or nonspecific until decompensation occurs (20,21).

A history of previous surgery was identified in 35.8% of patients, among whom 56.5% had cirrhosis, suggesting a potential association. Surgeries involving the liver, biliary tract, or abdominal cavity could predispose to hepatic injury through postoperative infections, iatrogenic insults, or drug-induced hepatotoxicity. While causality cannot be established in this observational design, the correlation warrants careful postoperative monitoring in patients with known hepatic risk factors (22,23). Cholelithiasis was present in 37.6% of the study population, though its direct contribution to cirrhosis remains debatable. Gallstones may co-exist with liver pathology due to overlapping metabolic risk factors, but their role as a primary etiological factor in cirrhosis appears limited based on these findings. Nonetheless, their presence may complicate the clinical course or mimic hepatic symptoms, potentially confounding diagnosis.

One of the key strengths of this study is its comprehensive clinical assessment combined with demographic stratification, offering insights into the multifaceted nature of liver cirrhosis in the regional population. The inclusion of variables such as BMI, gender, surgery history, and symptom duration adds contextual depth to the findings. However, the study also has limitations. The sample size was relatively small and confined to a single center, which may limit generalizability. Furthermore, objective disease staging tools, such as liver stiffness measurement, endoscopic evaluation for portal hypertension, or biochemical scoring systems (e.g., Child-Pugh or MELD scores), were not incorporated. Additionally, serological confirmation of hepatitis B and C status and detailed nutritional assessments were lacking, which are crucial to understanding the etiological spectrum of liver cirrhosis. Future research should aim for larger, multicenter studies incorporating both clinical and biochemical parameters to better delineate the interplay between risk factors and disease severity. Stratified analysis by etiology—whether viral, metabolic, autoimmune, or alcoholic—would also provide more actionable insights for targeted interventions. Moreover, longitudinal follow-up could elucidate progression patterns and outcomes, helping to optimize patient-specific management strategies. In conclusion, this study underscores the burden of liver cirrhosis among middle-aged males with undernutrition and a history of surgical interventions. These findings highlight the importance of early screening, nutritional support, and vigilant monitoring in at-risk populations to mitigate disease progression and improve outcomes.

CONCLUSION

This study highlighted a noteworthy association between liver cirrhosis and patients presenting with functional dyspepsia, particularly among middle-aged males and those with undernutrition. The correlation with surgical history and body mass index underscores the importance of individualized assessment in clinical settings. These findings support the need for heightened clinical vigilance and early diagnostic evaluation in dyspeptic patients, enabling timely identification of cirrhosis and more effective, targeted management strategies that may ultimately improve patient outcomes and reduce long-term complications.

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AUTHOR CONTRIBUTION

Author	Contribution
Yahya khan*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Qamar Niaz	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Mohammad Imran Younus	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muhammad Bilal Rizvi	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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