



FREQUENCY OF PEPTIC ULCER DISEASE IN PATIENTS WITH LIVER CIRRHOSIS PRESENTING WITH UPPER GASTROINTESTINAL BLEED

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Abstract: Peptic ulcer disease (PUD) is a notable cause of upper gastrointestinal bleeding (UGIB), especially in patients with liver cirrhosis, complicating their clinical outcomes. Understanding its prevalence and characteristics in this population is vital for effective management. **Objective:** To determine the frequency of peptic ulcer disease in patients with liver cirrhosis presenting with upper gastrointestinal bleeding (UGIB). **Methods:** This descriptive cross-sectional study was conducted in the Department of Gastroenterology at Hayatabad Medical Complex, Peshawar, over a six-month period. A sample of 145 patients with liver cirrhosis aged 20 to 60 years, presenting with UGIB, was selected. We determined the frequency of peptic ulcer disease in these patients. **Results:** Mean age was 41.32 ± 11.81 years. Peptic ulcer disease was present in 13.1% (19) of the patients. Gender distribution showed a slight predominance of females (54.5%), while peptic ulcer disease was more common in males (63.2%). The majority of peptic ulcers were classified as Forrest Class III (63.2%), indicating low risk, followed by Forrest Class IIC (21.1%) and IIA (15.8%). **Conclusion:** Peptic ulcer disease is a significant finding in cirrhotic patients presenting with UGIB, occurring in 13.1% of cases. Most ulcers were low-risk (Forrest Class III), and the prevalence was influenced by factors such as socioeconomic status and cirrhosis duration.

Keywords: Peptic ulcer disease, liver cirrhosis, upper gastrointestinal bleeding, Forrest classification, cirrhosis complications.

Introduction

Upper gastrointestinal bleeding (UGIB) in individuals with liver cirrhosis is a significant public health concern, with an annual incidence of 150 per 100,000 and inpatient death rates reaching as high as 10% (1). One. The primary causes encompass portal hypertension-related conditions such as esophageal and gastric varices, portal hypertensive gastropathy, as well as various ailments including peptic ulcer, acute gastric mucosal lesions (AGML), Mallory-Weiss syndrome, and tumors. EGV is the predominant etiology of upper gastrointestinal hemorrhage in individuals with liver cirrhosis (2, 3).

While upper gastrointestinal bleeding in cirrhotic individuals is predominantly attributed to esophago-gastric varices, a minor number of cases may also arise from peptic ulcers. The correlation between peptic ulcer and liver cirrhosis has been thoroughly shown in the literature, with an incidence ranging from 2% to 42% (4). Four. The clinical features, endoscopic findings, treatment, and prognosis of UGIB associated with peptic ulcers in cirrhotic patients differ from those of variceal bleeding; therefore, it is crucial to ascertain the etiology of bleeding in any cirrhotic patient with UGIB (5). Cirrhotic individuals who have peptic ulcers may have an elevated risk of hemorrhage due to coagulation malfunction and thrombocytopenia, diseases commonly seen in this population (6).

A study indicated that 60% of cirrhotic individuals with UGIB experienced peptic ulcer hemorrhage (4). In a separate investigation, the prevalence of peptic ulcer disease was found in 19.08% of patients with chronic liver disease presenting with upper gastrointestinal bleeding (7). Another study estimated the prevalence of peptic ulcer disease among individuals with liver cirrhosis at 10.3% (8).

Patients suffering from chronic liver disease with UGIB pose diagnostic challenges. In addition to variceal hemorrhage, patients may also experience a bleeding peptic ulcer. Consequently, I intended to ascertain the frequency of peptic ulcer disease in individuals with liver cirrhosis who exhibit UGIB. The findings of my investigation will estimate the impact of peptic ulcer hemorrhage in patients with cirrhosis. It will also facilitate improved counseling for these individuals. The findings of my work will assist future scholars in this field.

Methodology

The study was conducted in the Department of Gastroenterology at Hayatabad Medical Complex, Peshawar from 02-06-2024 till 02-09-24, using a descriptive cross-sectional design. The sample size was calculated based on the WHO sample size formula, with a 95% confidence level, 5% absolute precision, and an expected frequency of peptic ulcer disease of 10.3%, which resulted in a sample size of 145 participants. Non-probability consecutive sampling was employed, and the study spanned six months following approval from the CPSP and the hospital's ethical committee.

The inclusion criteria for the study were patients aged 20 to 60 years, of either gender, with a history of liver cirrhosis for more than six months and presenting with upper gastrointestinal bleeding (UGIB), as defined by the operational definition of the study. Patients with a history of gastric malignancy, previous gastric surgery, or those deemed unfit for endoscopy were excluded from the study.

After obtaining approval from the hospital, patients with liver cirrhosis who presented with UGIB were recruited

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from the emergency department of Hayatabad Medical Complex. Written informed consent was obtained from all participants, ensuring that confidentiality would be maintained and clarifying that participation in the study would not pose any risks to them. Baseline characteristics such as age, gender, body mass index (BMI), cause of liver cirrhosis, duration of cirrhosis, and baseline hemoglobin levels were recorded. Additional information, including the area of residence, socioeconomic status, and education level, was also collected.

In accordance with the institution's protocol, an urgent upper GI endoscopy was scheduled for each patient within 12 hours of presentation. Patients who were hemodynamically unstable, with a heart rate exceeding 100 beats per minute or hypotension with a systolic blood pressure below 90 mmHg and/or a diastolic pressure below 60 mmHg, were treated with crystalloid solutions, with or without blood transfusion. For patients with hemoglobin levels below 7 g/dL, transfusions were administered based on individual needs. Additionally, all patients were given prophylactic antibiotic therapy with intravenous third-generation cephalosporins to address suspected variceal bleeding.

The endoscopy procedures were performed within 12 hours to establish the diagnosis, control the bleeding, and prevent further bleeding. Conscious sedation was achieved with intravenous midazolam (2.5 mg). All endoscopies were conducted by two experienced endoscopists, with the researcher acting as an assistant. The presence of peptic ulcer disease, when observed, was recorded and classified according to the Forrest classification. All relevant data regarding peptic ulcer disease in cirrhotic patients presenting with UGIB were meticulously recorded by the researcher using a pre-designed proforma.

The data were analyzed using SPSS version 22. Categorical variables such as gender, cause of cirrhosis, area of residence, socioeconomic status, education level, presence of peptic ulcer disease, and Forrest classification of ulcers were presented as frequencies and percentages. Quantitative variables such as age, BMI, duration of liver cirrhosis, and hemoglobin levels were expressed as mean ± standard deviation. Data were further stratified by age, gender, BMI, cause of cirrhosis, and duration of cirrhosis, and post-stratification, a chi-square test was applied to assess statistical significance, with a p-value of ≤ 0.05 considered significant.

Results

Table 1 Demographics

Demographics	Frequency	Percentage
Age distribution (Years)	20 to 35	37.9%
	36 to 50	34.5%
	51 to 60	27.6%
Gender	Male	45.5%
	Female	54.5%
Area of residence	Rural	55.2%
	Urban	44.8%
Socioeconomic status	Low (< 50K RS/Month)	33.8%
	Middle (50K to 100K RS /Month)	52.4%
	High (> 100K RS/Month)	13.8%

Our study included a total of 145 patients with liver cirrhosis presenting with upper gastrointestinal bleeding (UGIB). The mean age of the patients was 41.32 ± 11.81 years, and their average body mass index (BMI) was 26.46 ± 4.92 kg/m². The duration of cirrhosis among these patients had a mean value of 67.39 ± 34.34 months. Regarding hemoglobin levels, the mean was 8.28 ± 1.02 mg/dl.

Gender distribution showed that 66 (45.5%) of the patients were male, while 79 (54.5%) were female. (Table 1). Regarding the causes of cirrhosis in this population, Hepatitis B was 42 (29.6%), Hepatitis C was 72 (49.7%), Wilson's disease 12 (8.3%), primary biliary cirrhosis 10 (6.9%), alcohol 5 (3.4%) and autoimmune disease 4 (2.8%). (Table 2)

Peptic ulcer disease was found in 13.1% (19 patients) of the study population, while 86.9% (126 patients) did not have peptic ulcers. Among those with peptic ulcer disease, the distribution of Forrest grades was as follows: 63.2% of patients were classified as Forrest Class III, 21.1% were classified as Forrest Class IIC, and 15.8% were classified as Forrest Class IIA.

When stratifying peptic ulcer disease by demographic factors, it was observed that among those aged 20 to 35 years, 26.3% had peptic ulcers, compared to 36.8% in both the 36 to 50 and 51 to 60 years age groups. Gender-wise, 63.2% of peptic ulcer patients were male, and 36.8% were female. Peptic ulcers were slightly more prevalent in urban residents (52.6%) compared to rural residents (47.4%). Peptic ulcers were more common in patients with low socioeconomic status (47.4%), followed by the middle-income group (42.1%), and least common in the high-income group (10.5%). Regarding education status, peptic ulcers were nearly equally prevalent in educated (47.4%) and uneducated (52.6%) patients. (Table 5)

In terms of the causes of cirrhosis, peptic ulcers were most frequently observed in patients with Hepatitis B 9 (47.4%), followed by Hepatitis C (42.1%). When analyzing the duration of cirrhosis, patients with peptic ulcers had the longest durations of cirrhosis, with 63.2% having cirrhosis for more than 40 months. In contrast, only 10.5% had cirrhosis for 6 to 24 months, and 26.3% had cirrhosis for 25 to 40 months. The majority of patients with peptic ulcers had BMIs either in the normal range (18 to 24.9 kg/m², 42.1%) or in the obese category (>29.9 kg/m², 42.1%), with fewer patients falling into the overweight category (25 to 29.9 kg/m², 15.8%). (Table 6)

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Education status	Educated	75	51.7%
	Uneducated	70	48.3%

Table 2 Causes of cirrhosis

Causes of cirrhosis	Frequency	Percent
Hepatitis B	42	29.0
Hepatitis C	72	49.7
Alcohol	5	3.4
Autoimmune hepatitis	4	2.8
Wilson’s disease	12	8.3
Primary biliary cirrhosis	10	6.9
Total	145	100.0

Table 3 Frequency of peptic ulcer disease

Peptic ulcer disease	Frequency	Percent
Yes	19	13.1
No	126	86.9
Total	145	100.0

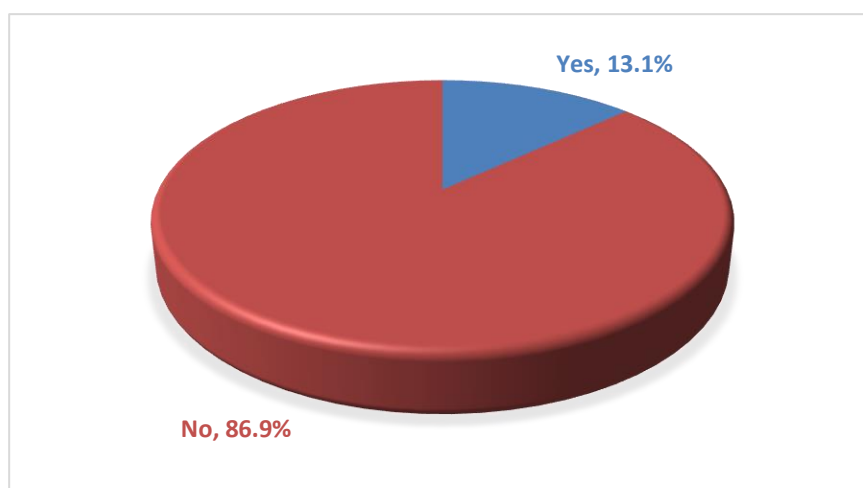


Figure 1 Peptic ulcer disease

Table 4 Forest class of peptic ulcer

Forest class of peptic ulcer	Frequency	Percent
IIA	3	15.8
IIC	4	21.1
III	12	63.2
Total	19	100.0

Table 5 Stratification of peptic ulcer disease with demographics

Demographics		Presence of peptic ulcer disease				P value
		Yes		No		
		n	%	n	%	
Age distribution (Years)	20 to 35	5	26.3%	50	39.7%	0.47
	36 to 50	7	36.8%	43	34.1%	
	51 to 60	7	36.8%	33	26.2%	
Gender	Male	12	63.2%	54	42.9%	0.09
	Female	7	36.8%	72	57.1%	
Area of residence	Rural	9	47.4%	71	56.3%	0.46
	Urban	10	52.6%	55	43.7%	
Socioeconomic status	Low (< 50K RS/Month)	9	47.4%	40	31.7%	0.40
	Middle (50K to 100K RS /Month)	8	42.1%	68	54.0%	
	High (> 100K RS/Month)	2	10.5%	18	14.3%	

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Education status	Educated	9	47.4%	66	52.4%	0.68
	Uneducated	10	52.6%	60	47.6%	

Table 6 Stratification of peptic ulcer disease with different parameters

Parameters		Presence of peptic ulcer disease				P value
		Yes		No		
		n	%	n	%	
Causes of cirrhosis	Hepatitis B	8	42.1%	34	27.0%	0.50
	Hepatitis C	9	47.4%	63	50.0%	
	Alcohol	0	0.0%	5	4.0%	
	Autoimmune hepatitis	1	5.3%	3	2.4%	
	Wilson’s disease	1	5.3%	11	8.7%	
	Primary biliary cirrhosis	0	0.0%	10	7.9%	
Duration of cirrhosis (Months)	6 to 24	2	10.5%	21	16.7%	0.07
	25 to 40	5	26.3%	11	8.7%	
	> 40	12	63.2%	94	74.6%	
BMI distribution (kg/m2)	18 to 24.9	8	42.1%	56	44.4%	0.49
	25 to 29.9	3	15.8%	32	25.4%	
	> 29.9	8	42.1%	38	30.2%	

Discussion

Our study examined 145 patients with liver cirrhosis presenting with upper gastrointestinal bleeding (UGIB), and we identified that 13.1% of patients had peptic ulcer disease. This is lower than the 33.3% prevalence of peptic ulcer disease reported by Hania Akbar et al. (9) in their study of 105 patients with chronic liver disease (CLD) presenting with UGIB. The difference in prevalence could be attributed to the different patient populations or underlying etiologies of cirrhosis. In our study, Hepatitis C and B were the major causes of cirrhosis, similarly in Hania Akbar et al’s. (9) study, viral hepatitis accounted for the majority of cases (42.9%).

Endoscopic findings in our study showed that the majority of patients with peptic ulcers were classified as Forrest Class III (63.2%), indicating the lowest risk of active bleeding. A smaller proportion of patients were classified as Forrest IIC (21.1%) and IIA (15.8%), indicating moderate risk. This is consistent with the findings of Yen HH et al (10), who reported a similar distribution of Forrest classifications, with Forrest III being the most common (42%) among 276 endoscopic images. In their study, Forrest IIC and IIA lesions accounted for 21.4% and 17% of cases, respectively, closely mirroring our findings. Both studies demonstrate that the majority of peptic ulcer cases in cirrhotic patients tend to be lower-risk, which is crucial for guiding treatment decisions.

When comparing our results to those from Hamid Ullah et al. (11), we observed a slightly lower prevalence of peptic ulcer bleeds in our cohort. Hamid Ullah et al. (11) reported that 10.8% of cirrhotic patients with UGIB had peptic ulcer bleeds, compared to 13.1% in our study. Despite the difference in percentages, the overall findings align in terms of highlighting the significant role of variceal bleeding in cirrhotic patients, as varices were the predominant cause of UGIB in both studies. In our study, no patients with alcohol-induced cirrhosis had peptic ulcers, which is consistent with the findings of Hamid Ullah et al. (11), who noted that alcohol-related cirrhosis presents a higher likelihood of

variceal bleeding rather than peptic ulcer disease. The predominance of variceal bleeding in cirrhotic patients reflects the impact of portal hypertension, a common complication in advanced liver disease, as both studies underscore.

In terms of Forrest classification, Yen HH et al (10), provided more detailed insights into the bleeding patterns of different Forrest classes. They reported that ulcers classified as Forrest I (active bleeding) had the highest bleeder area (85.67%) in endoscopic images, whereas Forrest III ulcers, like in our study, showed no bleeder area. This quantitative analysis supports the clinical relevance of Forrest grading in determining the risk of rebleeding and the need for intervention. Our findings that Forrest Class III was the most common, and that Forrest I was not observed, further emphasize that most of our patients presented with lower-risk ulcers, which might explain the relatively low rebleeding rate (4.7%) observed in our study.

In terms of gender distribution, our study found a slight female predominance (54.5%), while Hania Akbar et al. (9) and Hamid Ullah et al (11). both reported a male predominance (61.9% and 55.5%, respectively). This discrepancy could be attributed to the different patient populations and the causes of cirrhosis in each study. For example, alcohol-related cirrhosis, which is more common in males, was rare in our study, which likely contributed to the higher proportion of female patients.

When considering the role of socioeconomic factors, our study identified that peptic ulcers were more prevalent in patients with lower socioeconomic status, with 47.4% of patients with peptic ulcer disease coming from low-income backgrounds. This aligns with the findings of Hamid Ullah et al (11), who also noted that lower socioeconomic status is a significant risk factor for complications in cirrhotic patients. The underlying mechanisms for this association may include limited access to healthcare, delayed diagnosis, and poorer overall health management, all of which can exacerbate the severity of liver disease and its gastrointestinal complications.

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Conclusion

Our study highlights that peptic ulcer disease occurs in a significant portion of patients with liver cirrhosis presenting with upper gastrointestinal bleeding, with a prevalence of 13.1%. Most ulcers were classified as low-risk Forrest Class III.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate.

Approved by the department Concerned. (IRBEC-TCH0-0032/23)

Consent for publication

Approved

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Conflict of interest

The authors declared an absence of conflict of interest.

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Concept & Design of Study

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