

Frequency of Duodenal Ulcer in Cirrhosis of Liver

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ABSTRACT

Introduction: Cirrhosis of the liver is a common cause of duodenal ulcer. Liver cirrhosis results in portal hypertension, splenomegaly, esophageal varices (EV) and duodenal ulcers. Duodenal ulcer bleeding is a serious complication with significant morbidity and mortality. It has therefore been recommended that patients with liver cirrhosis should be screened for the presence of duodenal ulcer at the time of initial diagnosis, and at periodic intervals thereafter throughout life. Duodenal ulcer can cause fatal hemorrhage in patients of cirrhosis, thus emphasizing need for surveillance of duodenal ulcer as the cause of bleeding rather than esophageal varices. This study is to see the association of duodenal ulcer in cirrhotic patients presenting in Medical Unit 1. The application of its results may help in early management of life threatening upper gastrointestinal hemorrhage.

Objective: To determine the frequency of duodenal ulcers among patients of liver cirrhosis.

Study Design: Cross sectional survey.

Setting: Medical Unit 1, Services Hospital, Lahore.

Duration with dates: The study was completed over a period of 6 months; from 20th November 2008 to 19th May 2009.

Subjects and Methods: Hundred and thirty five patients who had coarse echotexture of liver on abdominal ultrasound, and fulfilling the inclusion criteria were enrolled in the study. These patients were then subjected to upper gastrointestinal endoscopy after informed consent and the presence and number of duodenal ulcers were noticed. Also noticed was site, size of ulcer and whether the ulcer was bleeding or not.

Results: The frequency of duodenal ulcers in patients of liver cirrhosis was 9.6%.

Conclusion: The study showed that duodenal ulcer was present in 9.6% patients of liver cirrhosis. Its application will help in identifying the cause of bleeding in cirrhotic patients while performing upper gastrointestinal endoscopy and will help in management.

Key Words: Cirrhosis, Duodenal ulcer, upper gastrointestinal endoscopy.

INTRODUCTION

Liver cirrhosis is a worldwide problem. It can be found in all social layers, races, age groups and both sexes. The most common causes of liver cirrhosis are alcoholism and viral hepatitis. Cirrhosis represents a growing burden of morbidity and mortality in United Kingdom, with an estimated 30,000 people living with cirrhosis and at least 7000 new cases being diagnosed each year. There was 45% increase in the incidence of cirrhosis during the decade 1992-2001 in the UK and 68% increase in prevalence.¹ Cirrhosis is responsible for 1.2% of all deaths in the U.S. According to the Center for Disease Control (CDC), in the year 2000, even though cause of death from cirrhosis and chronic liver disease had fallen in rank from 7th to 12th, the number of people who died from liver disease in United States of America was 26,219, almost the same as when cirrhosis was ranked 7th.²

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Cirrhosis results from the necrosis of liver cells followed by fibrosis and nodule formation. The liver architecture is diffusely abnormal and this interferes with liver blood flow and function. This derangement produces the clinical features of portal hypertension and impaired liver cell functions. Portal Hypertension, ascites, hepatic renal failure, encephalopathy, hepatocellular carcinoma and coagulopathy are the main complications.³

In cirrhotic patients, gastrointestinal bleeding is usually attributed to esophageal varices; however it has now been observed that 5-15%^{4, 5} cirrhotic patients bleed from duodenal ulcer instead of varices. Similarly 30% of the cirrhotic patients have dyspeptic symptoms and signs because of the peptic ulcer disease rather than the underlying cirrhosis.⁶

In USA, lifetime prevalence of peptic ulcers is 10% and duodenal ulcer is four times more common than gastric ulcer⁷. The ratio is 5:1 in Pakistan⁸ and very high duodenal to gastric ulcer ratio of 32:1 is found in certain areas of India.⁹ The prevalence of duodenal ulcer in cirrhotic patients is 9.5¹⁰. There is a strong relationship between *Helicobacter pylori* (H

pylori) and peptic ulcer disease and it is more common in duodenal ulcer than gastric ulcers and its frequency increases with increasing age.¹¹

NSAID associated peptic ulcer disease is common in Pakistan and most frequently associated with gastric and duodenal ulcer. H pylori infection is common in association with NSAID related peptic ulcers.¹² It has been reported that gastroduodenal ulcers and gastroduodenal erosions are particularly frequent in cirrhotic patients. In these patients with cirrhosis, the presence of gastroduodenal ulcer is significantly related to hypertensive gastropathy but not to H pylori infection. Recent alcohol intake favours the occurrence of gastroduodenal erosions.¹³

Similarly, eradication of H pylori does not reduce the residual ulcer rate in cirrhotic patients indicating that H pylori might not be a significant risk factor for peptic ulcer disease in cirrhotic patients. Hence routine H pylori eradication might not be warranted in patients with cirrhosis and peptic ulcer disease.¹⁴

It has been reported that there is an increased incidence of duodenal ulcer in patients of liver cirrhosis¹⁵ with low incidence of Helicobacter pylori infection¹⁶. It has also been reported that there is higher prevalence of asymptomatic peptic ulcer in decompensated cirrhotic patients.¹⁷ The pathogenesis of peptic ulcer in cirrhotics might be portal hypertension, which causes splanchnic congestion, interferes with normal reparative process of gastroduodenal mucosa, leading to increased susceptibility towards acid and pepsin secretion.¹⁸

Changes in gastric microcirculation in cirrhosis, such as increased number of straight arterioles and dilated precapillaries and veins have been reported. These alterations might contribute to gastroduodenal ulcers and other putative acid peptic lesions.^{19, 20}

Another factor potentially responsible for gastroduodenal lesions seen in cirrhosis might be hypercatabolic state of cirrhotic patients. This condition seems to occur independent of portal hypertension, but is more evident in patients with severe disease. It is most probably related to impaired reparative process.^{21, 22}

Increased levels of histamine has been reported in cirrhotic patients which might increase gastric acid secretion leading to peptic ulceration.²³

It has also been reported that there is excess vagal drive in cirrhosis¹⁶ and diminished prostaglandin content in gastric mucosa, which can cause peptic ulceration.²⁵

H.pylori infection has been linked directly to duodenal ulcers, in general population.²⁶ However, duodenal ulcer in cirrhotics seems to be independent of Helicobacter pylori infection.^{27, 28}

Duodenal ulcer in patients of cirrhosis tends to heal slowly and recur with higher frequency than in

controls with out cirrhosis. Seventy-nine percent of recurrences are asymptomatic with cirrhotic patients.¹⁷

Patients of cirrhosis of liver can present with hematemesis, melena and iron deficiency anemia due to gastrointestinal bleeding. Bleeding can be due to low platelet count, prolonged prothrombin time and general reduction of clotting factors.

It has been observed that duodenal ulcer is more common in cirrhotic patients than in general population. In previous years, most of bleeding episodes in cirrhotic patients have been attributed to esophageal varices. Wide spread use of upper gastrointestinal endoscopy has shown that in many cases other lesions such as erosions, gastritis or peptic ulcer especially duodenal ulcer may be responsible. No data is available regarding frequency of duodenal ulcer among cirrhotics in our community, consequently diagnosis of duodenal ulcer in patients may be missed and hence appropriate management of duodenal ulcer may be delayed especially in patients presenting with hematemesis.

The aim of my study was to determine the frequency of duodenal ulcer in patients of liver cirrhosis. This study was to help in management of cirrhotic patients having duodenal ulcers by knowing how frequently it is present and to help in decreasing morbidity and mortality.

MATERIALS AND METHODS

The study was conducted in Medical unit 1, Services Hospital, Lahore which was completed over a period of 06 months after the approval of synopsis, from 20-11-2008 to 19-05-2009. The calculated sample size was 135 cases with 5% margin of error and 95% confidence level taking prevalence of duodenal ulcer in cirrhosis patients i.e. 9.5%. Non-probability purposive sampling technique was used. Both male and female patients of all ages between 18-60 years with cirrhosis as per operational definition. Patients having cerebrovascular disease, chronic obstructive pulmonary disease, MI, corrosive intake, encephalopathy and chronic renal failure were excluded.

RESULTS

A total of 135 patients who had ascites and splenomegaly on physical examination and increased echogenicity and coarse echotexture of liver parenchyma on abdominal ultrasound were selected from the Medical Unit 1, Services Hospital Lahore.

Table I showed that amongst the 135 patients, 56.3% were male and 43.7% were females. Overall percentage of males was more than that of females.

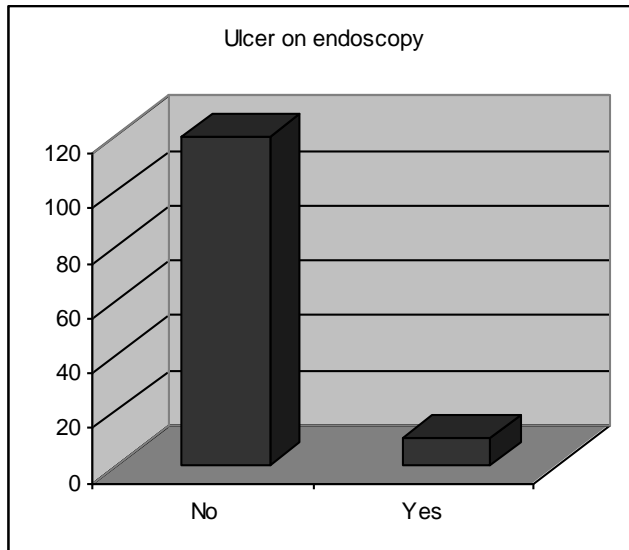
It was observed that cirrhosis is most common in the age group of 43-60 years i.e. 80% with mean age of 47.75 and standard deviation of 9.06. Frequency of duodenal ulcer was found to be 9.62% i.e. 13 patients out of total 135, whereas 122 were ulcer negative on endoscopy (90.37%) (Graph I).

Among the patients having duodenal ulcer, 10 patients (76.92%) were bleeding and 3 patients (23.08%) were not bleeding. As far as the site of duodenal ulcer is concerned, 9 patients had ulcer in first part of duodenum (69.23%) and 4 patients in the second part of duodenum (30.76%). Regarding the gender relationship with duodenal ulcer, 11.86% females (7 out of 59) and 7.89% males (6 out of 76 males) had duodenal ulcer (Graph II).

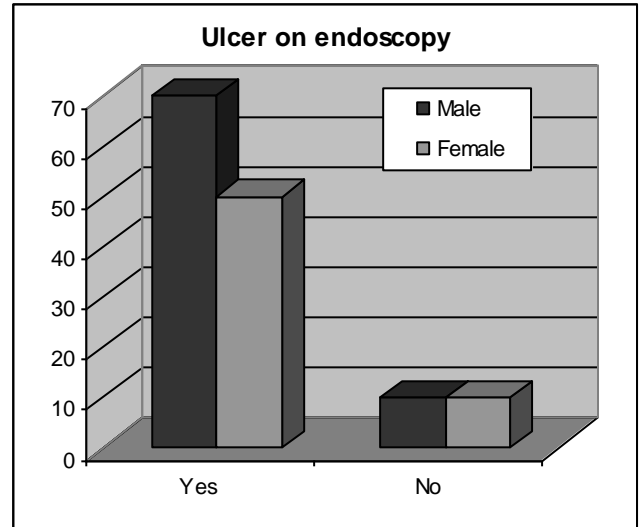
Thirty three patients had disease for 3 years (24.44%), 46 patients for 4 years (34.07%), 39 for 5 years (28.88%) and 17 patients were having disease for 6 years (12.59%). As far as the effect of duration of illness on duodenal ulcer is concerned, none of the patients with 3 years history showed duodenal ulcer. In 4 year group, out of 46, only one patient was ulcer positive (2.17%). 7 patients out of 39 patients with 5 years duration of illness were DU positive (17.94%). In patients with duration of illness for 6 years, duodenal ulcer frequency was 29.41 (5 out of 17 patients). It was evident that the longer the duration of illness, the higher the frequency of DU (Graph III).

Table 1: Gender wise distribution of cases (n=135)

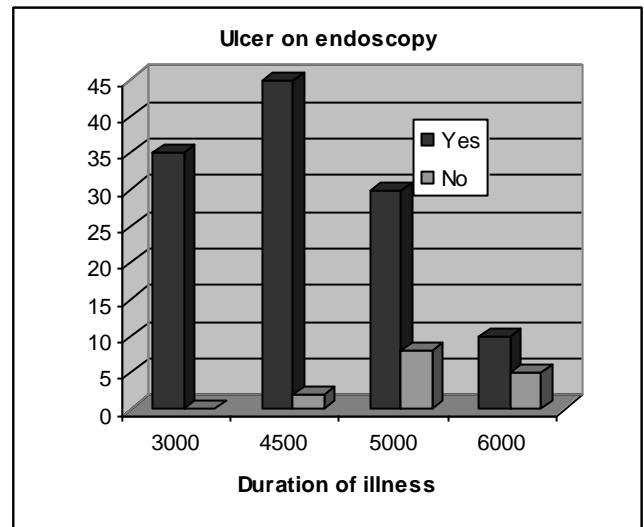
Gender	Frequency	Percentage %
Male	76	56.3
Female	59	43.7



Graph I: Frequency of duodenal ulcer in cirrhosis



Graph II: Duodenal ulcer in male and female patients



Graph III: Relationship of duodenal ulcer and duration of illness

DISCUSSION

The aim of the study was to determine the frequency of duodenal ulcer in patients of liver cirrhosis. Most of the patients included in our study were between 35 to 55 years of age. Similar mean age was found in most of other studies done on cirrhotic patients.^{29, 30, 31} The reason may be that cirrhosis usually occurs as an end result of chronic hepatitis which usually takes one to two decades to lead to cirrhosis.

Gastrointestinal (GI) bleeding in the patients of liver cirrhosis is usually attributed to esophageal varices. However; duodenal ulcer can be the cause of the upper GI bleeding instead of varices. Similarly dyspepsia in cirrhotic patients may be because of

gastroduodenal ulcer in about 30 % and not due to cirrhosis itself.³²

In UK, a study was conducted to see the pattern of peptic ulcer disease. In this study, admission rates for peptic ulcer disease from the year 1972 to 2000 was noted. It has been observed that there is significant decrease in admission and mortality rates because of peptic ulcer disease³³. Several recent epidemiological surveys show a decrease in incidence of all causes of upper gastrointestinal bleeding. But the incidence of peptic ulcer bleeding remained stable. Peptic ulcer bleeding is the most common cause of upper gastrointestinal bleeding, responsible for about 50% of all cases. Esophagitis and gastric erosions are 2nd and 3rd common causes respectively. Esophageal varices are the cause of bleeding in cirrhotic patients in 50-60%.³⁴

It was found in a study conducted by Svoboda P et al.³⁵ that duodenal ulcer frequency is 11.1%.³⁷ In our study, similar results are found. The frequency of duodenal ulcer in our study is 9.6% (13 out of 135 patients). In another study conducted by Svoboda P et al. gastroduodenal ulcers were found to be 25.8%.³⁶

In our study, out of 13 patients who presented with duodenal ulcer, bleeding was found in 10 patients (76.92%). Similar results were found in a study conducted in Hong Kong in 2008.³⁷ Duodenal ulcer is presently the most important cause of bleeding in children as compared to adults where it is the 3rd commonest cause of GI bleeding. 75% boys were having duodenal ulcer as compared to adults where it is 10%.³⁷ Acute bleeding is more frequent in boys (boy to girl ratio 2.6:1)

in a study conducted by Houben CH et al.³⁷ In one study, male to female ratio of patients affected with Duodenal ulcer was 70 male and 30 females³⁸ where as in our study, duodenal ulcer was found in 7 female patients (11.86%) and 6 male patients (7.89%). In another study, patients presenting with significant gastrointestinal bleeding, between January 1997 and December 2004, were subjected to endoscopy. Out of total 892 patients, esophageal varices were found in 580 patients, followed by gastric erosions in 133 patients, Esophageal Ulcer in 65 patients and duodenal ulcer in 61 patients.³⁹

The duration of illness was the effect modifier. It was seen that patients having cirrhosis for longer duration were having more incidence of duodenal ulcer. The patients with duration of illness for 6 years, showed highest frequency of duodenal ulcer (29%), while those with duration of illness of 5 years had DU in 17%. Patients with 4 years history had DU in 0.02% and patients with 3 years duration of illness had a frequency of DU 0%. Hence the frequency of duodenal ulcer in patients of liver cirrhosis is almost

same as in past years. Secondly, duodenal ulcer can be the cause of bleeding in patients presenting with upper GI bleeding. Thirdly, duration of illness is associated with presence or absence of duodenal ulcer. Finally endoscopic surveillance for duodenal ulcer in patients of cirrhosis is helpful for diagnosis and treatment .

CONCLUSION

It was noted that the frequency of duodenal ulcer in patients of cirrhosis of liver was 9.6%. The effect of duration of illness on the occurrence of duodenal ulcer is evident but it needs further probe .

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