ORIGINAL ARTICLE

FREQUENCY OF GALLSTONES IN PATIENTS WITH LIVER CIRRHOSIS

Azhar Hussain, Muhammad Arif Nadeem, Sajid Nisar, Hafiza Ammarah Tauseef

Medical Unit-4, Services Hospital, Lahore, Pakistan

Background: Liver cirrhosis is a serious disease which can lead to liver failure. The main objective of this study was to ascertain the frequency of gallstones in patients with liver cirrhosis. **Methods:** One hundred and fifty patients fulfilling the inclusion criteria were selected from Medical Unit-IV for this cross sectional study. Their abdominal ultrasound was done to diagnose liver cirrhosis and to see presence of gallstones. All the patients were assessed by same sonologist. Their demographic data was entered in a specially designed pro forma. **Results:** Frequency of gall stones in patients with liver cirrhosis was found to be 21.6%. **Conclusion:** This study reveals that the gallstones are frequent in patients suffering from chronic liver disease. The frequency of gallstones increases with increase in disease duration.

Keywords: Cirrhosis, Gallstones, Fibrosis, Chronic liver disease

J Ayub Med Coll Abbottabad 2014;26(3):341–3

INTRODUCTION

Cirrhosis is defined as hepatic necrosis followed by fibrosis and regeneration. It is final common histological pathway for a number of chronic liver diseases. It is a serious disease.[1] Aetiology includes chronic viral hepatitis, alcohol, drug toxicity, autoimmune, metabolic liver diseases, and other disorders.[2] Hepatitis C is the commonest cause of cirrhosis in Pakistan.[3] About 7 million people in Pakistan are suffering from chronic viral hepatitis which can lead to liver cirrhosis.[4]

Clinical features of cirrhosis or chronic liver disease (CLD) ranges from asymptomatic in one third of patients to full range of symptoms in two third of patients. Important symptoms are fatigue, weakness, development of ascites, gastrointestinal bleed and encephalopathy.[5]

Complications arise in cirrhosis in decompensated disease only and represent disease progression. Early detection and treatment improves prognosis. Complications include hepatic encephalopathy, oesophageal varices, haemorrhoids, splenomegaly, caput medusae and bleeding tendency.[1,6]

Gallstones are solid particles that are formed from bile in the gallbladder. Gallstones are a major public health problem, and this disorder is one of the most common of all digestive diseases. Gallstones are more common in women than in men and increase in incidence in both genders and all races with aging. Over 10% of men and 20% of women have gallstones by the age of 65.[7]

There are two types of gallstones; Cholesterol stones and pigment stones. Gallstones within the gallbladder often cause no problems. If there are many or they are large, they may cause pain when the gallbladder responds to a fatty meal. They may also cause problems if they move out of the gallbladder. They can cause obstructive jaundice, gallstone ileus and most common complication being cholecystitis.[8]

An increased prevalence of gallstones was demonstrated in patients with liver cirrhosis, higher in the advanced stages of the disease. Some studies have found impaired emptying of the gallbladder in cirrhotic patients. Gallbladder contractility is impaired in patients with liver cirrhosis and gallstones. Hypomotility is proportional to the severity of liver disease. Gallbladder hypomotility might contribute to the increased gallstone formation in patients with advanced cirrhosis.[9]

The main objective of this study was to ascertain the frequency of gallstones in patients with liver cirrhosis in our setup.

MATERIAL AND METHODS

It was a cross-sectional survey, conducted in Medical Unit-4, Services Hospital, Lahore. Sample size of 150 cases was calculated with 95% confidence level, 7.5% margin of error and taking expected percentage of gallstones that was 31% in patients of liver cirrhosis. Patients were selected through non-probability purposive sampling. All Patients showing coarse echo-texture of liver parenchyma on abdominal ultrasound were taken. Both genders male and female of age 40–60 years were included. The Patients who had undergone cholecystectomy due to causes other than gallstones were excluded as well as all those who were unable to give written informed consent. All those patients having pathology making ultrasound technically difficult like ascites were also excluded.

After ethical approval and written informed consent from patient, all those fulfilling inclusion criteria were selected. Abdominal Ultrasound was

performed on all patients and presence and absence of gallstones was documented. All the patients were assessed by same sonologist to minimize the operator dependent variability. All their information was collected through a specially designed *pro forma*. The *pro forma* included demographic information like name, age and gender. Effect modifier like duration of disease was controlled through stratification.

All collected data was entered in SPSS-12 for statistical analysis. Only descriptive analysis was performed in this study using mean±standard deviation for quantitative variables like patients age, while counts and percentages for qualitative variables. Presence of gall stones was qualitative variable in the study and was presented as frequency distribution tables and percentages. Data was stratified for duration of disease.

RESULTS

A total of 150 patients with chronic liver disease diagnosed on the basis of coarse echo-texture on ultrasonography were selected from Medical Unit-4 of Services Hospital, Lahore.

The gallstones were present in 21.3% of the cases while absent in the rest of 78.7%. There were few patients at the extremes of age groups shown, with the minimum age of 40 and maximum age of 60. Mean age was 51.12±6.031. There were 70 patients between 40–50 years of age and 80 patients between 51–60 years of age, indicating that majority of CLD patients were between 51–60 years of age. Gender-wise distribution depicts that out of total sample female and males percentage varies as 74 (49.3%) and 76 (50.7%) respectively. Table-1 is distribution of patients by duration of disease there were 59 patients (39.3%) who have disease duration less than 5 years, 83 (55.3%) have duration of disease between 5–10 years and 8 patients were having disease more than 10 years duration. Table-2 shows cross tabulation between gender and presence of gallstones about 23 (71.8%f) females out of total 32 patients that have gallstones and 9 (28.2%) are males.

Table-3 shows presence of gall stones with respect to age. In age group 40–50 years 12 (17%) have gallstones. Among age group 51–60, 20 (25%) patients had gall stones. Table-4 shows 1 patient with gallstones have disease duration less than 5 years, 26 patients with duration 5–10 years and 5 patients with duration more than 10 years.

It shows that 1.7% of patients with less than 5 years duration of disease have gallstones, while this percentage increases to 31.32–62% in patients with duration of disease between 5–10 years and more than 10 years respectively. From the results, it was clearly evident that frequency of gallstones increases with disease duration.

Table-1: Age distribution of patients

Age groups	No of patients	Frequency (%)
Less than 5 year	59	39.3
5–10 years	83	55.3
More than 10 year	8	5.3
Total	150	100

Table-2: Gender wise distribution of gall stones

Gender	Gallstones		Total
	Present	Absent	
Female	23 (71.8%)	51	74 (49.3%)
Male	9 (28.2%)	67	76 (50.7%)
Total	32	118	150

Table-3: Distribution of gall stones by age groups

Age groups(years)	Gall stones
40–50	12 (17%)
51–60	20 (25%)

Table-4: Distribution of gall stones by disease duration

Duration of disease	Gallstones		Total
	Present	absent	
<5 years	1	58	59
5-10 years	26	57	83
> 10 years	5	3	8
Total	32	118	150

DISCUSSION

Advanced cirrhosis represents the end stage of any chronic liver disease.[10] It was the 12th leading cause of death in the United States in 2000, accounting for more than 25,000 deaths.[11] It eventually leads to two major syndromes of portal hypertension and hepatic insufficiency.[12]

Gallstones have been recognized since antiquity, being identified in autopsy studies of Egyptian mummies. Today, gallbladder disease is a frequent problem in developed countries, representing a major health burden. An estimated 20–25 million adults in the U.S. are afflicted with gallstones, the most common cause of biliary tract disease in this age group. Gallstone disease is the leading cause of inpatient admissions for gastrointestinal problems.

Certain risk factors for gallstones are immutable: female gender, increasing age and ethnicity/family (genetic traits). Others are modifiable: obesity, the metabolic syndrome, rapid weight loss, certain diseases (cirrhosis, Crohn's disease) and gallbladder stasis (from spinal cord injury or drugs like somatostatin). The only established dietary risk is a high caloric intake. Protective factors include diets containing fibre, vegetable protein, nuts, calcium, vitamin-C, coffee and alcohol, plus physical activity.

Cirrhosis is a well-established risk factor for pigment (rather than cholesterol) gallstone disease. The prevalence reaches 30%, being more common in those with a worse Child class (2 or 3), and with a high BMI. The biological basis is unclear but may relate to

altered pigment secretion, increased oestrogen levels and/or abnormal gallbladder motility in cirrhosis.[13]

In our study mean age of the patients was 51.1200±6.03 years which is comparable to mean age of 53.3±9.9 years in another study conducted at Islamabad between March-August, 2008.[14]

In this study 50.7% patients were male and 49.3% patients were female. In another study conducted at Mayo Hospital, Lahore 50% was male and 50% female which is comparable to our study.[15] It was noted that gallstones were more frequent among female patients with chronic liver disease.[16]

In this study frequency of gall stones in patients of liver cirrhosis is 21.3% as compared to 31% in a study[15], so present study showed slight less frequency of gallstones which may be due to difference of population.

In our study majority of patients fall in age group of 51–60years with duration of disease 5–10 years, which shows that this disease is more prevalent in middle to old age patients and these patients usually present after 5 years of their illness.

This study shows that gallstones were present in 1.7% patients with less than 5 years of duration of liver disease while this frequency increases to 62% in patients with the duration of disease more than 10 years. It clearly shows that frequency of gallstones has relation with severity and duration of disease so patients with longer duration of disease should be screened for gallstones. However relationship between different etiologist of chronic liver disease like hepatitis-C, hepatitis-B or autoimmune hepatitis etc. could not be established. Present study is hospital based, done in tertiary care hospital which covers large population. Sample size taken in this study is also large and all the possible confounders were taken care of to prevent bias. Moreover this study was easy to perform as *pro forma* was used for survey, it was also economical. However, multicentre trials needed to know the exact frequency of gallstones in patients with liver cirrhosis. These would also be helpful to know the frequency in different populations. Further studies are also needed to cover extreme of ages.

Further studies are required to better understand the relationship between different risk factors influencing gallstones. Understanding this relationship will give us better insight into the pathophysiology of formation of gallstones in patients with diseased liver. This will enable us to introduce new treatment and diagnostic modalities which can reduce morbidity and mortality related to presence of gallstones.

CONCLUSION

The study suggests that gall-stones are frequent in patients suffering from chronic liver disease. Most of the times they are incidentally diagnosed during investigations.

REFERENCES

1. Friedman LS. Liver, Biliary Tract and Pancreas. In: Tierney LM, McPhee SJ, Papadakis MA, editors. Current Medical Diagnosis and Treatment. 46th ed. New York: McGraw Hill; 2007:p. 664–718.
2. Par A, Par G. Liver fibrosis: pathophysiology, diagnosis and treatment. Orv Hetil 2005;146:3–13.
3. Khokhar N. Serum aminotransferase levels and platelet count as predictive factor of fibrosis and cirrhosis in patients with chronic hepatitis C infection. J Pak Med Assoc 2003; 53: 101–4.
4. Idrees M, Lal A, Naseem M, Khalid M. High prevalence of hepatitis C virus infection in the largest province of Pakistan. J Dig Dis. 2008;9:95–103.
5. Mohan P, Colvin C, Glymph C, Chandra RR, Kleiner DE, Patel KM, *et al*. Clinical spectrum and histopathologic features of chronic hepatitis C infection in children. J Pediatr 2007;150:168–74.
6. Nazish Z, Inayatullah M, Nasir SA, Arshad M, Tanveer S, Naqvi AB. Liver Cirrhosis; Clinical Presentation. Professional Med J 2002;9:207–12.
7. Johnston DE, Kaplan MM. Pathogenesis and treatment of gallstones. N Engl J Med 1993; 328:412–21.
8. Portincasa P, Moschetta A, Palasciano G. Cholesterol gallstone disease. Lancet 2006; 368:230–9.
9. Acalovschi M, Dumitrascu DL, Nicoara CD. Gallbladder contractility in liver cirrhosis: comparative study in patients with and without gallbladder stones. Dig Dis Sci 2004;49:17–24.
10. Fernández-Esparrach G, Sánchez-Fueyo A, Ginès P, Uriz J, Quintó L, Ventura PJ, *et al*. A prognostic model for predicting survival in cirrhosis with ascites. J Hepatol 2001;34:46–52.
11. Anderson RN. Deaths: leading causes for 2000. Natl Vital Stat Rep 2002;50:1–85.
12. de Franchis R, Pascal JP, Ancona E, Burroughs AK, Henderson M, Fleig W, *et al*. Definitions, methodology and therapeutic strategies in portal hypertension. J Hepatol 1998;15:256–61.
13. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. Best Pract Res Clin Gastroenterol 2006;20:981–96.
14. Butt Z, Hyder Q. Cholelithiasis in hepatic cirrhosis: Evaluating the role of risk factors. J Pak Med Assoc 2010;60:641–4.
15. Naheed T, Akbar N, Akbar N. Frequency of Gallstones in patients of liver cirrhosis - a study in Lahore. Pak J Med Sci 2004;20:215–8.
16. Acalovschi M, Blendea D, Feier C, Letia AI, Ratiu N, Dumitrascu DL, *et al*. Risk factors for symptomatic gallstones in patients with liver cirrhosis: a case-control study. Am J Gastroenterol 2003;98:1856–60.

Address for Correspondence:

Dr. Azhar Hussain, Medical Unit-4**,** Services Hospital Lahore, Pakistan
Cell: +92-300-4400187, +92-321-4847983
Email: drazhar163@yahoo.com