

Association of Gallbladder Wall Thickness in Patients with Cirrhosis

MUHAMMAD FAROOQ KHAN¹, BASHIR ULLAH², SALMA KADIR³, MOHAMMAD AKRAM BAJWA⁴

¹Registrar, Department of Gastroenterology, Bolan Medical Complex Hospital, Quetta

²Associate Professor, Department of Medicine, Bolan Medical Complex Hospital, Quetta

³Assistant Professor of Medicine, Liaquat University of Medical & Health Sciences, Jamshoro

⁴Assistant Professor of Gastroenterology, Liaquat University of Medical & Health Sciences, Jamshoro

Correspondence to: Dr. Muhammad Farooq Khan, E-mail: dr_farooq82@hotmail.com, Cell 0333-8121118

ABSTRACT

Aim: To examine the association of gallbladder wall thickness in patients presented with liver cirrhosis.

Study Design: Prospective study

Place and Duration of Study: Department of Gastroenterology, Bolan Medical Complex Hospital, Quetta from 1st July 2018 to 30th September 2020.

Methodology: One hundred and sixty patients both genders with liver cirrhosis of Child Pugh Class A were enrolled. Patients were categorized into two groups; Group A (esophageal varices) and group B (non esophageal varices). Ultrasonographically gallbladder wall thickness was examined. Gallbladder wall thickness >4mm was considered as abnormal.

Results: Patients with esophageal varices had significantly increased gallbladder wall thickness 4.96 ± 0.85 mm as compared to patients with non esophageal varices 2.54 ± 0.76 mm. In group A, 65 (81.25%) patients had gallbladder wall thickness >4mm while in group B, 8 (10%) patients had gallbladder wall thickness >4mm and significant difference was observed between both groups with p-value <0.0001.

Conclusion: Measuring gallbladder wall thickness is very useful for detection of esophageal varices in cirrhotic patients. A significant association was found between gallbladder wall thickness and liver cirrhosis patients with esophageal varices.

Keywords: Liver cirrhosis, Gallbladder wall thickness, Esophageal varices

INTRODUCTION

Hepatitis B and C-caused cirrhosis of the liver is a chronic condition worldwide. Cirrhosis patients have several changes in various tissues and organs, often with severe deterioration of the biliary system. The subsequent thickening of gallbladder walls is a higher occurrence of gallstones^{1,2}.

Cirrhotic patients currently have gallbladder wall thickening and impaired contractility identified, but most published studies have been done in patients with portal hypertension and hepatic failure^{3,4}.

Diffuse gallbladder-wall thickening is a non-specific modification caused by various disorders, both intrinsic conditions (acute cholecystitis and gallbladder-carcinoma) and extracholecystic diseases such as acute hepatitis, liver cirrhosis, hypoalbuminemia, acquired heart failure, pancreatitis, acute pyelonephritis⁵.

Gallbladder emptying is a physiological process in response to meal primarily co-ordinate by the rate of gastric emptying of foods in duodenum and the subsequent release of cholecystokinin, which induces gallbladder contraction. The emptying of the gallbladder in normal subjects has several causes: age, body surface, thickness of the wall, fasting volume, hormonal factors and the composition of meals. The occurrence of gallstones in cirrhotic patients has been suggested to increase with a decreased contractility, although incongruous findings are reported^{6,7}.

Real-time ultrasound (US) is the method of visualizing direct gall bladders under physiological and pathological

conditions, since it enables repeated measurements at short intervals and offers information on the thickness, content and contraction of the gallbladder wall. The ultrasound measurement of spleen measurements and the portal vein diameter is a beneficial, non-invasive approach that can lead to portal hypertension diagnosis. Thus, Gallbladder (GBWT) thickening detected in ultrasonography in patients with chronic liver disease can be used as a marker for esophageal varicose veins^{8,9}. We conducted present study with aimed to examine the association of gallbladder wall thickness in liver cirrhosis patients.

PATIENTS AND METHODS

This prospective/observational study was conducted at Department of Gastroenterology, Bolan Medical Complex Hospital, Quetta from 1st July 2018 to 30th September 2020. A total of 160 patients of both genders with liver cirrhosis of Child Pugh Class A were enrolled. After taking written consent detailed demographics including age, sex, body mass index and etiology of liver cirrhosis were recorded. Patients with hepatic failure or coma, bleeding episode, intrinsic diseases of gallbladder were excluded. Patients were divided in two groups; Group A (esophageal varices) and group B (non esophageal varices). Ultrasonographically gallbladder wall thickness was examined. Gallbladder wall thickness >4mm was considered as abnormal. Data was analyzed by SPSS 27.0. Chi square test was applied to examine the association of gallbladder wall thickness and esophageal varices. P-value <0.05 was taken as significant.

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RESULTS

There were 52 (65%) and 48 (60%) male patients and 28 (35%) and 40% patients were females in group A and B. Mean age of patients in group A was 46.28±8.74 years and in group B it was 45.84±9.32 years. Mean BMI in group A was 24.25±1.36 kg/m² and in group B mean BMI was 24.47±1.28 kg/m² (Table 1)

Patients with esophageal varices had significantly increased gallbladder wall thickness 4.96±0.85 mm as compared to patients with non esophageal varices 2.54±0.76 mm. In group A 65(81.25%) patients had gallbladder wall thickness >4mm while in group B 8 (10%) patients had gallbladder wall thickness >4mm. A significant difference was observed between both groups with p-value <0.0001 (Table 2)

Table 1: Demographic information of the patients (n=160)

Variable	Group A	Group B
Gender		
Mean Age (years)	46.28±8.74	45.84±9.32
Mean BMI (kg/m ²)	24.25±1.36	24.47±1.28
Gender		
Male	52 (65%)	48 (60%)
Female	28 (35%)	32 (40%)

P-value >0.05

Table 2: Association of gallbladder wall thickness between both groups

Gall bladder wall thickness	Group A	Group B	P-value
>4 mm	65 (81.25%)	8 (10%)	0.0001
<4 mm	15 (18.75%)	72 (90%)	

DISCUSSION

Gallbladder wall thickening in liver cirrhosis is often seen¹⁰ and is often recorded in connection with portal hypertension.¹¹ The portal hypertension was associated with submucosal oedema and areas of dilated vessels in the gallbladder wall in a hamster cirrhosis model. These histological changes were associated with thickening of gallbladder walls and impaired contractility of the wall.¹² Majority of patients in the present study were males more than 60% and mean age of overall patients was 45.85±10.87 years. These results were comparable to some previous studies in which male patients were high in numbers 55% to 60% as compared to females and average age of patients was 45 years.^{13,14}

In this study, we found that 80% patients had liver cirrhosis due hepatitis C. A study conducted by Loreno et al¹⁵ reported that 69.5% liver cirrhosis patients had viral etiology.

In the current study, we found that patients with esophageal varices had significantly increased gallbladder wall thickness 4.96±0.85 mm as compared to patients with non esophageal varices 2.54±0.76 mm. In group A, 65 (81.25%) patients had gallbladder wall thickness >4mm while in group B, 8 (10%) patients had gallbladder wall thickness >4mm. A significant difference was observed between both groups with p-value <0.0001. A study conducted by Begum et al¹⁶ demonstrated that patients with esophageal varices had significantly increased gall bladder wall thickness as compared to patients with non

esophageal varices (5.6±0.2mm versus to 2.7±0.1mm) with p-value <0.001. Tsaknakis et al¹⁷ reported similarity to our findings, in their study patients with esophageal varices had significantly higher gallbladder wall thickness 4.4mm as compared to patients with non esophageal varices 2.8mm with p-value 0.0001.

Esophageal varices was correlated with a platelet count to a spleen diameter ratio of 909 and less.¹⁸ Enlarged spleen is caused by portal hypertension, with decreased thrombopoietin serum levels also associated with low platelets, as their liver function was reduced.¹⁹ The utility of this ratio was verified and the summative sensitivity of the 84% ratio with 78% specificity was determined by Chen to predict esophageal varices. The etiology of the liver disease with a sensitivity of 92% in viral liver cirrhosis also affected the sensitivity of this ratio²⁰. With the platelet count to spleen ratio mentioned previously²¹, the sensitivity of our dataset was slightly lower. The causes could be more diverse than in previous tests for liver disease in our cohort. Another non-invasive approach is the use of a CT scan with 90% sensitivity and 72% specificity for the detection of esophageal varices²².

CONCLUSION

The measuring gallbladder wall thickness is very useful for detection of esophageal varices in cirrhotic patients. A significant association was found between gallbladder wall thickness and liver cirrhosis patients with esophageal varices.

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