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Original Article

Frequency of Esophageal Varices in Chronic Liver Disease Patients & its Relationship to Mean of Ratio of Right Lobe of Liver to Serum Albumin Concentration

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Abstract

Objective: Aim of present study is to find the frequency of esophageal varices in CLD patients & its relationship to the mean of ratio of right lobe of liver to serum albumin concentration.

Methods: This cross sectional study was completed in Department of Gastroenterology, Mayo Hospital Lahore in six months. After ethical approval, 200 diagnosed patients of CLD recruited using non-probability purposive sampling technique. An informed written consent was acquired from each patient & endoscopy was done for the presence of esophageal varices, ultrasonography to measure right lobe of liver and serum sample to check albumin levels. All patients were then divided in two groups' i.e. esophageal varices (A) and other without varices (B). The ratio of right lobe of liver to serum albumin concentration was calculated for both groups. Data was analyzed using SPSS Version 26.0.

Results: Out of 200 patients, 109 (54.5%) had esophageal varices while 91(45.5%) had no varices while mean ratio of right lobe of liver and serum albumin concentration among the two groups revealed high ratio in esophageal varcies group as compare to without varices group i.e. 39.92+7.43 versus 34.53+5.27 respectively.

Conclusion: The frequency of esophageal varices was high in CLD patients while mean of ratio of right lobe of liver to serum albumin concentration was markedly high among patients having varices compared to those lacking varices.

Keywords: Chronic liver disease, esophageal varices, mean ratio, right lobe of liver, Serum albumin concentration

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Introduction

Chronic Liver Disease (CLD) is a slowly progressive disease resulting from damage to the liver cells ending in fibrosis and nodular regeneration. It is the 12th major reason of death in United States.[1] One of its fatal complications is esophageal variceal bleeding. The prevalence of esophageal varices among patients is around sixty to eighty percent while chances of bleeding are also 25-35%. This incidence increases around 5% annually and progression rate around 5-10% annually.[2] Increase in size of varices leads to increased chance of their rupture which can lead to life threatening bleeding. The death rate with every episode of variceal bleeding is 17-57%.[3] Incidence of the first esophageal haemorrhage ranges from 20-40% upto two years. Repeated episodes of bleeding occur in 30-40% patients in first week. Thus early detection and prevention of bleeding due to varices is the main step in management of cirrhotic patients and can improve the morbidity of such patients. The American Association for Study Of Liver Diseases (AASLD) recommends that when cirrhosis is diagnosed, all patients should be assessed for esophageal varices.[4] Endoscopy is invasive procedure, costly at private setup and not easily available at government hospitals all over Pakistan especially the rural areas. Moreover subjecting an individual to endoscopy is an unpleasant procedure as a result many patients may refuse to give consent. The best screening strategy would be that patients with both low to high chances of esophageal varices bleeding could be identified with the help of non invasive, easily available and cheaper parameters. Researchers have tried to identify parameters that non

invasively diagnose the esophageal varices.[5,6,7,8] Alempijevic and co authors first reported the ratio of right lobe of liver and serum albumin concentration as non invasive parameter in evaluation of portal hyr pertension.[9]

The literature demonstrated that biochemical, clinical an ultrasonographic tests in combination or alone may present appropriate prediction for non-invasive assessment of esophageal varices.[7]

Mahmoud AA, et al enrolled 120 cases of chronic liver disease, out of which esophageal varices were present in 60 cases i.e 50% esophageal varices were present. They documented that ratio of right lobe of liver was markedly low in patients with no \][;uiiuiarices than in patients with esophageal varices [33.84 ± 6.31 VS 40.76 ± 11.61]10.

All patients suffering from liver cirrhosis must ensure endoscopy for proper diagnosis especially to rule out esophageal varices. However, this facility of endoscopy is not present in all setups. This has been observed in the previous study by Mahmoud AA, et al, that right lobe of liver and serum albumin ratio was higher in patients with esophageal varices as compared to normal patients. This is the only study which has done the comparison and the results were equivocal. So, we want to compare the mean of ratio of right lobe of liver and serum albumin concentration among patients with and without esophageal varices so as to detect if there is any difference between the values of the two. This will aid us in making guidelines in future for our setups and early prophylaxis for upper GI bleed due to esophageal varices. Therefore this study was undertaken to observe the frequency of esophageal varices in chronic liver disease patients & its relationship to mean of ratio of right lobe of liver to serum albumin concentration.

Methods

This cross sectional study was completed in Department of Gastroenterology, Mayo Hospital Lahore in six months starting from January till June 2020. After the ethical approval of the study, 200 patients of chronic liver disease (diagnosed with clinical signs & symptoms of jaundice, abdominal distention, stigmata of chronic liver disease, coarse shrunken liver & dilated portal vein, splenomegly, ascities, with deranged liver function tests & increased prothrombin time) of age 20 to 45 years with either gender were taken in this study by non-probability purposive sampling. A sample size of 200 patients is calculated by taking leve of confidence as 95%, Absolute precision as 6% and expected occurrence of esophageal varices as 50% in chronic liver disease cases undergoing endoscopy. Patients with acute on chronic hepatitis, congestive hepatomegaly & hepatocellular carcinoma & taking beta blockers or nitrates or had albumin or blood transfusion over last 20 days were excluded. An informed consent was acquired from each patient. Then all the patients underwent upper gastrointestinal (GI) endoscopy. Then patients were divided into two groups as esophageal varices (A) and without esophageal varices (B). All the patients then underwent abdominal ultrasonography to measure the span of right lobe of liver in midclavicular line and serum albumin concentration was also checked. The ratio of right lobe of liver diameter with serum albumin concentration was calculated for all patients. Data was analyzed using SPSS Version 21. The qualitative variables (gender etc) were described as frequencies and percentages. The quantitative variables like age (in years) and ratio of right lobe of liver to albumin in both groups were described as mean + standard deviation. The mean of right lobe of liver to albumin ratio was compared for the two groups (A&B). The difference between the two groups was detected by applying t-test (having $p < 0.05$ as significant). Data was stratified for the grades of esophageal varices (grade 1 to grade 4) to address the effect modifiers.

Results

Most of the patients were between age group 31-40 years i.e. 40% (n=80), 37.5% (n=75) were between 41-45 years and only 22.5 % (n=45) were between 20-30 years of age, mean and SD was calculated as 38.67+2.50 years. Gender distribution of the patients was 57% (n=114) male and 43% (n=86) females.

Frequency of esophageal varices in chronic liver disease patients revealed 54.5% (n=109) while 45.5% (n=91) had no findings of the varices. (Table No. 1) Comparison of mean ratio of right lobe of liver and serum albumin concentration among revealed high ratio in group A as compared to Group B i.e. 39.92+7.43 versus 34.53+ 5.27 & p value was calculated 0.01 which showed sig-

Table 1: *Frequency of esophageal varices in patients of chronic liver disease (n=200)*

Esophageal varices	No. of patients	%
Yes	109	54.5
No	91	45.5
Total	**200**	**100**

Table 2: *Comparison of mean of ratio of right lobe of liver and serum albumin concentration between GROUP A & B (n=200)*

Ratio Of Right Lobe Of Liver And Serum Albumin Concentration	Group A (n=109)	Group B (n=91)
	39.92±7.43	34.53±5.27

P value=0.01s

nificant difference. (Table No. 2)

Stratification for ratio of right lobe of liver and serum albumin concentration among patients of group A & B according to grades of esophageal varices was recorded as 38.43+6.12 versus 34.28+5.01 in Grade I, 38.54+ 6.53 versus 34.19+5.22 in Grade II, 39.16+3.27 versus 34.28+3.13 in Grade III and 39.76+2.54 versus 34.43+ 2.15 in Grade IV esophageal varices. (Table No.3)

Table 3: *Stratification for ratio of right lobe of liver and serum albumin concentration between Group A & B according to grades of esophageal varices (n=200)*

Grades of Varices	Ratio Of Right Lobe Of Liver And Serum Albumin Concentration	
	Group A (n=109)	Group B (n=91)
Grade I	38.43±6.12	34.28±5.01
Grade II	38.54±6.53	34.19±5.22
Grade III	39.16±3.27	34.28±3.13
Grade IV	39.76±2.54	34.43±2.15

Discussions

The results of the current study are parallel with Mahmoud AA and co-workers[10] who enrolled 120 cases of chronic liver disease, out of which esophageal varices were present in 60 cases i.e 50% esophageal varices were present. They documented that ratio of right lobe of liver was markedly decreased in cases without varices than with esophageal varices [33.84 ± 6.31 vs. 40.76 ± 11.61].

Tamara Alempijevic and co-workers[14] studied the value of biochemical and ultrasonographic tools to assess the chances of existence and extent of magnitude of varices thus concluded that serum albumen to the diameter of right lobe of liver and platelet count to the diameter ratios of spleen were simple tools providing precise assessment of presence of esophageal varices along their grading in liver cirrhosis cases as shown in our study.

Some researchers have reported that noninvasive tool are invalid for avoiding the endoscopy in few causes of chronic liver disease like prime biliary cirrhosis and sclerosis. The chances of esophageal varices detection are lesser in these cases if thrombocyte count lowers than 200000/mm^3, most likely because of the preservation of throbopoietin production in these cases.[15]

There are many studies on correlation of spleen size & severity of esophageal varices.[16-18] Watanabe[19] measured ratio of spleen (multiple of length, width and height of spleen measurements through CT Scan) and concluded that increased ratio gives higher chances of esophageal variceal bleeding in CLD patients.[20] However current study reveals that ratio of right lobe of liver was markedly decreased among patients lacking varices as compared to the subjects having esophageal varices, so the results of the study are helpful in making guidelines in future.

Conclusion

The frequency of esophageal varices was higher among chronic liver disease patients while mean of the ratio of right lobe of liver diameter to serum albumin concentration was markedly raised in patients with esophageal varices. Hence in future early management of varices can be done in order to prevent morbidity & mortality.

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