DOI: https://doi.org/10.53350/pjmhs22165259

ORIGINAL ARTICLE

Elevation of AST/ALT Ratio in Association with Severity of Esophageal Varices in Patients with Hepatic Cirrhosis

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ABSTRACT

Objective: To determine the elevation of AST/ALT ratio in association with severity of esophageal varices in patients with hepatic cirrhosis.

Study Design: Cross sectional survey

Place and Duration of Study: Medical Unit II, Jinnah Hospital Lahore from November 2018 to April 2019

Methodology: One hundred and ten subjects were enrolled. The complete history, physical examination and appropriate investigations were done like liver functions test to see the ratio of AST/ALT and upper GI Endoscopy to confirm the presence or absence of esophageal varices.

Results: The mean age of the patients was 45.6±5.2 years with 77.27% males and 22.73% females. Paquet grading system showed that esophageal varices were presented in 20.9% grade II. Within the 65 cases of esophageal varices 30 patients of liver cirrhosis were having a 27% high risk of esophageal varices. ALT and AST were significantly higher in high risk esophageal varices.

Conclusion: The elevated level of ALT and AST are significantly associated with the severity of esophageal varices in hepatic cirrhosispatients.

Key words: Elevation, AST/ALT ratio, Association, Esophageal varices, Hepatic cirrhosis

INTRODUCTION

Recent estimates show that more than 185 million people around the world have been infected with HCVand this virus has significant mortality rate as 350,000 die each year.[1] The burden of HCV in South Asia is around 3.4% and estimated >50 million people are affected.[2] In Pakistan situation is very alarming as more than 10 million population is reported to be affected.[3] Most people infected with the virus are unaware of their infection as this Virus remains asymptomatic in the body for years and for many who havebeen diagnosed, treatment remains unavailable.[4]

Portal hypertension has been clearly associated with esophageal varices in hepatic cirrhosis patients. Hemorrhage caused as a consequence of esophageal varices is a major mortality causer and has a prevalence of bleeding as 10-20% with unfortunately survival ratio up to a year in only 63% of cases. Advancement in hepatic cirrhosis and red signs are the major factors related with esophageal varices.[5,6] Recent diagnostic protocol involves endoscopic findings of red signs and is considered as gold standard.[7,8] The recommended time for EGD is within a follow-up of one to three years dependent on varices size. On the other hand EGD is an invasive and costly procedure and might not be recommended. Lower cost non-invasive procedures can be relied on in such conditions.[5]

There are various noninvasive methods to assess the presence of esophageal varices and presence of chronic liver disease .i.e. APRI ratio, AAT ratio, FIB-4 index.[9,10] Severity of thrombocytopenia as predictor of presence of esophageal varices was studied as a non invasive parameter.[8] A study conducted in Sindh showed that those cirrhotic patients that have esophageal varices also have advanced biochemical and radiological changes.[9] AST/ALT ratio (AAT ratio) is considered to be one of the most important non invasive markers for prediction of liver cirrhosis.[5] AST/ALT ratio was found to be high in patients who were at more risk of bleeding.[6]

Pakistan is a country with limited resources. Endoscopic facility is not available in many remote areas and even in some tertiary care hospitals. The rationale of this study is to establish a reliable easy and cheap method as compared to Endoscopy to screen the presence of EV in cirrhotic patients.

MATERIAL AND METHOD

This cross-sectional survey was conducted at Medical Unit II, Jinnah Hospital Lahore from November 2018 to April 2019 and 110 patients were enrolled. Patients age 18-70 years, either genders or liver cirrhosis were included. Patients of non-cirrhotic portal hypertension were excluded.After an informed consent a detailed demographic profile of each case was taken. Baseline medical history examination as well as clinical assessments was detailed. Laboratory assessments including CBC testing and liver functioning test were conducted. Ultrasonographical imaging comprising on liver scan was performed for proper assessment of liver cirrhosis. The lab test in addition to USG reports and clinical evaluation were collectively used for diagnosing hepatic cirrhosis. The cause of liver cirrhosis was evaluated through ultrasound imaging and laboratory assessment. Enzyme linked immune sorbent assay was used for detecting hepatitis C within enrolled patients. Complete history, physical examination and appropriate investigations were done like liver functions test to see the ratio of AST/ALT and upper GI endoscopy to confirm the presence or absence of esophageal varices. The variceal size was graded from grade I-IV by the method of Paquet grading system. Red sign was evaluated. Those patients having large varices and under grade III or IV or those with small varices and red signs were at high alert of their disease status. The data was entered and analyzed through SPSS-26. The Chi square test was applied and p value<0.05 considered significant.

RESULTS

The mean age of the patients was 45.6±5.2 years with 77.27% males and 22.73% females. The Paquet grading system showed that esophageal varices were presented in 20.6% grade II while in 19.2% patients as grade I. There were 40.6% those patients who were not having esophageal varices present in them (Table 1).

Table 1: Age, gender and Paquet Grading System for esophageal varices (n=110)

Characteristics	No.	%
Age (years)	45.6±5.2	
Gender		
Male	85	77.27
Female	25	22.73
Varices Grading		
Grad I	21	19.2
Grade II	23	20.6
Grade III	11	10.0
Grade IV	10	9.6
Without Varices	45	40.6

Within the 65 cases of esophageal varices, there were 31.80% such as 35 those patients having low risk of esophageal varices while 30 patients of liver cirrhosis were having a 27% high risk of esophageal varices in them (Fig. 1).

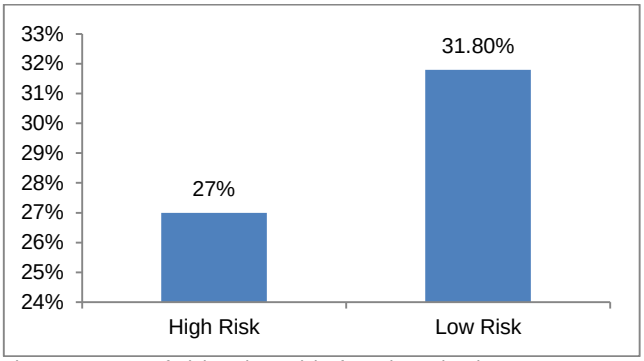

Fig. 1: Frequency of High and Low risk of esophageal varices

The biochemical and hematological parameters showed that ALT was >55 IU/dl in the hepatic cirrhosis cases while AST was > 70 IU/dl in the registered patients where normal levels of ALT were 5-35IU/dl whereas AST as 5-40IU/dl. The overall platelets levels were 124.11±55.9 (Table 2).

Table 2: Descriptive statistics of the biochemical and hematological parameters

Parameters	Mean±SD
Alanine Transaminase IU/L	58.05±22.7
Aspartate Transaminase IU/L	71.3±27.9
Hemoglobulin gm/dl	13.1±1.2
White blood cell count x10^3/mm	5.32±1.86
Platelets x10^3/mm	124.11±55.9
Total bilirubin mg/dl	0.99±0.29
Serum albumin gm/dl	3.63±0.45

Normal range of platelets 140-450µl; total bilirubin 0.3 mg/dL; serum albumin3.4 to 5.4 g/dL

In this study the levels of ALT and AST were significantly higher in high risk esophageal varices patients than those with low risk of esophageal varices. A significant variance was also presented between the platelets count of high and low risk patients (Table 3).

Table 3: Comparison of esophageal varices risk among patients

Parameters	Esophageal varices		p value
	Elevated risk patients (n=30)	Reduced risk patients (n=35)	
Alanine Transaminase IU/L	50.16±16.9	57.62±21.0	0.04
Aspartate Transaminase IU/L	74.21±21.2	66.02±23.1	0.01
Hemoglobulin gm/dl	12.89±1.23	12.88±1.05	0.52
White blood cell count x10^3/mm	5.02±1.44	5.01±1.65	0.71
Platelets x10^3/mm	119.75±49.2	105.3±45.1	0.04
Total bilirubin mg/dl	0.99±0.22	1.1±0.36	0.12
Serum albumin gm/dl	3.66±0.4	3.53±0.34	0.33

DISCUSSION

Varices hemorrhage is a major implication and a life threatening disorder occurred mainly due to portal hypertension. Bleeding chances is mainly associated with varices size and red sign presence. Although various biochemical indicators can be used for the analysis and diagnosis of varices however, esophagogastroduodenoscopy (EGD)is considered as most effective and reliable method of for the evaluation of varices size. This type of screening method is quick, simple, cost effective and reliable.[11-14] Esophagogastroduodenoscopy is widely used protocol for confirming whether the cirrhotic patient need to receive varices treatment or not.[15,16]

In the present study, several biomarkers related to liver cirrhosis were examined including ALT, AST, bilirubin, albumin for the evaluation of portal hypertension that ultimately exacerbates liver fibrosis. Values were quite higher and significantly deviates from the normal ranges of biochemical analytes I high risk group as compared to low risk group. Preset study determined thatesophageal varices were presented in 20.9% grade II while in 19.09% patients as grade I. High risk of esophageal varices was present in 27% of the study participants. International studies also report the similar findings.[6,17]

South Asian countries are already combating with many infectious diseases and hepatic C virus appeared to be causing massive mortalities every year. In low income countries, this situation gets worsen where native people were already suffering from various diseases and infections. In Pakistan, 10 million people are affected with HCV. Main concern with HCV infection is that, people remain unaware and this is called silent killer when virus remain in persistent phase.[18,19] Nationwide surveys and screening programs should be done for the evaluation and confirmation of hepatic C virus.

CONCLUSION

Biochemical indicators were quite higher in high risk group of esophageal varices as compared to low risk patients. Most of the study participants were indicated as high risk group.

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