Original Article

Platelet Count / Splenic Size Ratio: a Parameter to Predict the Presence of Oesophageal Varices in Cirrhotics

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ABSTRACT

350 million people are infected with Hepatitis B virus (HBV) and 60 million people with Hepatitis C virus (HCV). Chronic infection by these viruses leads to cirrhosis of liver and hepato-cellular carcinoma (HCC). Esophageal varices develop in cirrhotic patients which can be demonstrated by invasive methods or predicted by non-invasive methods.

Material And Methods: An observational, Cross sectional study was conducted in Medical Unit-IV, Liver Center of District Head Quarters Hospital and Medical units of Allied Hospital, Faisalabad for 6 months from 23 May 2007 to 22 November 2007. The study was conducted on 100 patients diagnosed as post viral cirrhosis of liver of either sex between 25 -70 years of age.

Results: The ratio between platelet count and spleen size was calculated .The mean ratio for those with esophageal varices was found to be 650 (100 -1614) and for those without esophageal varices, the mean value of the ratio was calculated to be 2453 (1600-3483), which was significantly different ($p<0.05$).

Discussion: Non-invasive markers have been used to predict varices in cirrhotic patients. Cirrhotics with esophageal varices have a significantly lower platelet count and a significantly greater ultrasonographic spleen size as compared to those patients of liver cirrhosis without esophageal varices[13,14] a fact also consistant with our study ($p < 0.05$).

INTRODUCTION

350 million people are infected with Hepatitis B virus (HBV) and 60 million people) with Hepatitis C virus (HCV) in the world [1]. Chronic infection by these viruses leads to slow progressive Liver disease that over a period of up to 30 years may result in cirrhosis, chronic liver failure and hepato-cellular carcinoma (HCC) [2]. According to estimates, 12- 20 % of patients with Chronic hepatitis progress to cirrhosis in 5 years [4,5] HCV infection progresses to chronic hepatitis in 85 % cases and to cirrhosis in 20%. Cirrhosis of liver is becoming an epidemic in Pakistan due to very high prevalence of hepatitis C and hepatitis B virus infection in our community [6]. It is currently recommended that all patients with cirrhosis of liver, should undergo upper gastrointestinal endoscopy to identify those, who have esophageal varices that carry a high risk of bleeding and may benefit from prophylactic measures [6,7]. This approach leads to unnecessary upper gastrointestinal endoscopies in those without esophageal varices. The prevalence of esophageal varices in cirrhotics is variable. We performed this study non-invasively through platelet count / splenic size ratio, as a parameter to predict esophageal varices and to select patients for screening endoscopy.

OBJECTIVE

To evaluate platelet count / splenic size ratio, as a non-invasive parameter to predict the presence or absence of esophageal varices in cirrhotic patients.

MATERIAL AND METHODS

An observational, Cross sectional study was conducted in Medical Unit-IV, Liver Center of District Head Quarters Hospital and Medical Units of Allied Hospital, Faisalabad for 6 months from May 2007 to November 2007. The study was conducted on 100 patients diagnosed as post viral cirrhosis of liver of either sex of 25-70 years. Patients who were unlikely to benefit from prophylactic therapy, already taking

medication for this purpose, patients with previous upper gastrointestinal hemorrhage who already had under gone endoscopy and hemodynamically unstable patients were excluded from study. All patients underwent upper gastro-intestinal endoscopy to evaluate the presence of esophageal varices. Patients were categorized into two groups on the basis of presence or absence of esophageal varices. Platelet count, ultrasonographic splenic size of both the groups and platelet count / splenic size ratio were recorded and compared between the two groups with esophageal varices and without esophageal varices.

RESULTS

Out of 100 patients, 56 (56%) were male and 44 (44%) were female (Ttable-1) .HCV was etiological cause of liver cirrhosis in 71 (71%) patients, HBV in 29 (29%) patients (Table-2).

Table-1
Frequency of Patients According to Endoscopy Finding and associated Gender Distribution

Sex	Endoscopic Findings	
	Oesophageal Varices Absent	Oesophagal Varices Present
Female patients `% of Total	21 42%	23 46%
Male patients % of Total	29 58%	27 54%
Total patients % of Total	50 100%	50 100%

Endoscopic finding showed that, 50 patients in which esophageal varices were absent, 21 (42%) were females and 29 (56%) were males while 50 patients in which esophageal varices were present, 23 (46%) were females and 27 (54%) were males (Table-1).

Platelet count was 16,000-149,000/µL in patients with esophageal varices with the mean count 90040/µL, while in patients without esophageal varices the platelet count range was 203000 to 470000 / l with mean count 293476 /µL. (Table-3).

Ultrasonographic spleen size range was 88-188 mm in patients with esophageal varices with mean 146 mm and while it was from 105-140 mm in patients without esophageal varices. The mean spleen size in these patients was 124 mm. (Table-4).

Table-2
Distribution of Patient according to Etiology of Cirrhosis (n=100)

		#	Percent
Valid	Cirrhosis of Liver due to HBV	29	29%
	Cirrhosis of Liver due to HCV	71	71%
	Cirrhosis of Liver Due to HBV&HCV	–	–
	Total	100	100%

Table-3
Descriptive Statistics Platelet Count / µL

Variable	Min.	Max.	Mean	SE mean	St. Dev
Esophageal varices absent N=50	203000	470000	302800	9224	65227
Esophageal varices Present N=50	16000	149000	90040	5467	38657

Table-4
Descriptive Statistics Ultrasonic Spleen Size (mm)

Variable	Min	Max	Mean	SE mean	St. Dev
Esophageal varices Absent N=50	105	140	124	1.35	9.53
Esophageal varices Present N=50	88	188	145	3.13	22.1

The ratio between platelet count and spleen size was calculated .The mean ratio for those with esophageal varices was found to be 650 (100 -1614) and for those without esophageal varices, the mean value of the ratio was calculated to be 2453 (1600-3483), which was significantly different ($p< 0.05$) (Table-5).

Applying the receiver operating curves (ROC) best sensitivity and specificity cut off value for the variable was calculated. A cut off value of 2200 for platelet count / spleen size ratio was found to give a 97% sensitivity and 88% specificity for prediction of presence or absence of esophageal varices.

Table-5
Descriptive Statistics of Platelet Count / Spleen Size ratio

Variables	Min.	Max	SE Mean	Standard Deviation
Esophageal varices absent N=50	1600	3615	72	506
Esophageal Varices Present N=50	100	1614	48	341

DISCUSSION

In our study more than half the patients were over 45 years of the age as was in other studies conducted in Pakistan [8,9,10]. Hepatitis C virus is becoming an epidemic and an important cause of cirrhosis of liver in Pakistan and in this study 71 % of our patients were HCV and 29 % were HBV positive. This is in complete harmony with the study done by Alam in the province of N.W.F.P and Saad Maqsood at the Pakistan institute of Medical Sciences, Islamabad [11,12]. Non-invasive markers have been used to predict varices in cirrhotic patients. Cirrhotics with esophageal varices had a significantly lower platelet count / splenic size ratio in contrast to cirrhotics without esophageal varices [13,14] a fact also consistent with our study ($p < 0.05$).

CONCLUSION

Platelet count / splenic size ratio is an important and an independent parameter to predict the presence or absence of esophageal varices in cirrhotic patients.

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