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

Mirza Akmal Sharif, Robina Firdous, Tahir Ahmed Khan, Tahir Habib Rizvi, M. Idrees Shani, Muhammad Mukhtar Elahi

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 consistent 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 (Table-1). HCV was etiologic 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

<table>
<thead>
<tr>
<th>Sex</th>
<th>Endoscopic Findings</th>
<th>Oesophageal Varices Absent</th>
<th>Oesophageal Varices Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female patients</td>
<td>% of Total</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42%</td>
<td>46%</td>
</tr>
<tr>
<td>Male patients</td>
<td>% of Total</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>58%</td>
<td>54%</td>
</tr>
<tr>
<td>Total patients</td>
<td>% of Total</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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 29,3476 /µL. (Table-3).

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

<table>
<thead>
<tr>
<th>Etiology</th>
<th>#</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cirrhosis of Liver due to HBV</td>
<td>29</td>
<td>29%</td>
</tr>
<tr>
<td>Cirrhosis of Liver due to HCV</td>
<td>71</td>
<td>71%</td>
</tr>
<tr>
<td>Cirrhosis of Liver Due to HBV &amp; HCV</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table-3
Descriptive Statistics Platelet Count / µL

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SE mean</th>
<th>St. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal varices absent N=50</td>
<td>203000</td>
<td>470000</td>
<td>302800</td>
<td>9224</td>
<td>65227</td>
</tr>
<tr>
<td>Esophageal varices Present N=50</td>
<td>16000</td>
<td>149000</td>
<td>90040</td>
<td>5467</td>
<td>38657</td>
</tr>
</tbody>
</table>

Table-4
Descriptive Statistics Ultrasonic Spleen Size (mm)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SE mean</th>
<th>St. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal varices Absent N=50</td>
<td>105</td>
<td>140</td>
<td>124</td>
<td>1.35</td>
<td>9.53</td>
</tr>
<tr>
<td>Esophageal varices Present N=50</td>
<td>88</td>
<td>188</td>
<td>145</td>
<td>3.13</td>
<td>22.1</td>
</tr>
</tbody>
</table>

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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>
<thead>
<tr>
<th>Variables</th>
<th>Min.</th>
<th>Max</th>
<th>SE</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal varices absent N=50</td>
<td>1600</td>
<td>3615</td>
<td>72</td>
<td>506</td>
</tr>
<tr>
<td>Esophageal varices Present N=50</td>
<td>100</td>
<td>1614</td>
<td>48</td>
<td>341</td>
</tr>
</tbody>
</table>

**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.

**REFERENCES**


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