Comparison of MELD, Child Pugh Score and Rockall Score for Predicting Rebleeding and In-Hospital Mortality in Patients of Variceal Bleeding

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Esophageal or gastric variceal bleeding is responsible for 25-30% mortality in patients of cirrhosis of liver.1 Child Turcotte Pugh (CTP) and Model for end stage liver disease (MELD) scores are used for survival prediction in cirrhosis while Rockall score is used in non-variceal bleeding outcome prediction. Value of these scores in judging outcome in variceal bleeding is not established.

A study was planned at Shaikh Zayed, Postgraduate Medical Institute for evaluation of Rockall score in predicting in-hospital rebleeding and mortality of variceal bleeding and was published in May 2007 JCPSP.2 We re-explored the same data for comparison of CTP, MELD and Rockall score in determining survival in variceal bleeding patients.

Methods and materials for data collection were same as given in original study.2 CTP, MELD and Rockall scores were calculated for each patient. Receiver-operating Characteristic (ROC) curves were used to determine the concordance c-statistics (equivalent to the area under the ROC curve) of each score for mortality and rebleeding. A model was considered to have diagnostic accuracy if the c-statistics were > 0.7 and excellent diagnostic accuracy if c-statistics were > 0.8. C-statistics of models were compared using chi-square test with p-value < 0.05 being significant.

Total of 336 patients with mean age of 52.28 and male to female ratio 2.08 (227/109) were included. On endoscopy, 287 (85.4%) patients had esophageal varices, 27 fundal varices (11%), 10 (2.91%) had both fundal and esophageal varices while 2 had ectopic duodenal varix.

In-hospital follow-up revealed death of 20 (6%) patients, 9 due to uncontrolled bleeding, 8 due to other complications of cirrhosis despite bleeding control and 3 died following rebleeding. Rebleeding was observed in 19 (5.7%) patients, 11 stabilized with pharmacological therapy, 4 after repeat endoscopic intervention, one patient had to be operated while 3 patients died despite repeat endoscopy attempt.

Mean scores of CTP, MELD and Rockall in survivors and non-survivors and in those with and without rebleeding are given in Table I. C-statistics was 0.688 for MELD score, 0.824 for Rockall score and 0.801 for CTP score, for mortality. Chi-square test revealed that Rockall score and CTP score have better predictability for mortality in variceal bleeding. AUC for predicting rebleeding was 0.419 for MELD score, 0.52 for CTP score and 0.803 for Rockall score.

In this study, these scoring systems have shown good predictability for survival in patients with variceal bleeding with Rockall score being the best. Sanders et al. concluded that Rockall scoring system was a valid method of assessing outcome in all-cause upper GI bleeding.3

MELD is the score of choice for stratification of liver transplant candidates for allocation of donor liver. It is superior to CTP score due to its objective variables which are statistically validated.4

Contrary to this, we have found CTP score to have better c-statistics (0.801 vs. 0.688) for mortality than MELD. This difference might be due to different behavior of liver disease in our population with regard to etiology, age group and complications. Ascites and encephalopathy, both major complications in our patients, are in CTP score but not in MELD score and are associated with adverse outcome in our patients.5

Both scoring systems have not shown predictability for

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**Table I:** Comparison of three scoring system for predicting mortality and rebleeding in patients of variceal bleeding.

<table>
<thead>
<tr>
<th>Score</th>
<th>Mortality Mean values in patients (+SD)</th>
<th>Rebleeding Mean values in patients (+SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alive</td>
<td>Dead</td>
</tr>
<tr>
<td>Rockall</td>
<td>2.22</td>
<td>4.30</td>
</tr>
<tr>
<td>CTP score</td>
<td>8.30</td>
<td>10.65</td>
</tr>
<tr>
<td>MELD</td>
<td>15.41</td>
<td>20.65</td>
</tr>
</tbody>
</table>

*SD= Standard Deviation

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rebleeding as compared to Rockall score which had excellent c-statistics (0.803).

Our study establishes the status of Rockall scoring system as best for predicting mortality and in-hospital rebleeding in variceal bleeding. MELD and CTP scores can be used for survival prediction of bleeding patients but not for assessing chances of rebleeding.

REFERENCES


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