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ASSESSMENT OF PLATELET COUNT/SPLENIC DIAMETER RATIO AS A NON-INVASIVE MARKER FOR OESOPHAGEAL VARICES IN LIVER CIRRHOSIS

General Medicine

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ABSTRACT

Background: The WHO defines cirrhosis as a diffuse liver disease with fibrosis and conversion of normal architecture into abnormal nodules. Studies link portal hypertension markers-such as splenomegaly and low platelet count-to oesophageal varices. **Objectives:** To assess the platelet count-to-splenic diameter ratio in cirrhosis and To correlate this ratio with oesophageal varices. **Methodology:** A hospital-based cross-sectional study at Navodaya Medical College, Raichur, included 114 confirmed cirrhosis cases over one year. Cut-off values were: platelet count = 0.984, splenic diameter = 0.783, platelet count/splenic diameter ratio = 0.986. **Conclusion:** All cirrhosis patients require screening for varices. As endoscopy is invasive and costly, non-invasive markers like the platelet count/splenic diameter ratio can help reduce unnecessary early endoscopies.

KEYWORDS

INTRODUCTION

The World Health Organization defines cirrhosis as a widespread liver condition characterized by fibrosis and the replacement of normal architecture with structurally abnormal nodules.[1,2] The transition from liver injury to cirrhosis can occur over a span of weeks to several years.[3] Cirrhosis can present with a wide range of clinical features and complications, some potentially life-threatening. In advanced stages, patients often experience sequelae such as portal hypertension and its related outcomes-gastroesophageal variceal hemorrhage, splenomegaly, ascites, hepatic encephalopathy, spontaneous bacterial peritonitis, hepatorenal syndrome, and hepatocellular carcinoma.[4]

Portal hypertension is one of the most frequent complications of hepatic cirrhosis, with many patients developing oesophageal varices and facing a considerable risk of variceal bleeding.[5] In patients with cirrhosis, the annual incidence of oesophageal varices is approximately 5%, and the likelihood of progression from small to large varices is around 20% within one year. The overall prevalence of oesophageal varices in cirrhosis is estimated at 50%. The rebleeding rate ranges between 25% and 35%, with most events occurring within the first year, and mortality from each bleeding episode ranges from 17% to 57%.[9,10]

Various studies indicate that biochemical, clinical, and ultrasonographic parameters-whether used individually or in combination-can predict the likelihood of varices without invasive testing. The probability of bleeding increases with the presence of red signs (such as red cherry spots) and with larger varices. Non-selective beta-blockers and prophylactic endoscopic variceal ligation have been shown to reduce the incidence of initial bleeding and mortality in cirrhotic patients with large varices.[6] Current recommendations advise annual endoscopic screening for those with small varices and every two years for cirrhotic patients without varices. Despite these guidelines, repeat endoscopy poses discomfort, financial burden, and reveals large varices in only about 30% of cases. Several investigations have shown that portal hypertension–related factors, such as splenomegaly and thrombocytopenia, correlate strongly with the presence of oesophageal varices.

Review Of Literature

The noninvasive diagnosis of oesophageal varices in patients with cirrhosis offers significant clinical advantages. It enables the identification of patient subgroups most likely to require endoscopy, thereby reducing both the cost and the potential complications associated with the procedure.[11] Predictive markers are particularly valuable for physicians in rural areas, where endoscopic facilities may be unavailable, as they allow for the early initiation of appropriate primary pharmacological prophylaxis. In urban healthcare settings-where the endoscopy workload is substantial-such noninvasive predictors, as examined in this study, can facilitate the commencement of drug therapy while the patient awaits an endoscopic evaluation.[12]

MATERIALS AND METHODS

Study Design: This was a hospital-based, cross-sectional study conducted over a period of one year.

Source of Data:

The study population comprised patients admitted under the Department of General Medicine at Navodaya Medical College Hospital and Research Centre, Raichur, with a confirmed diagnosis of chronic liver disease.

Inclusion Criteria:

- Consecutive patients aged 18 years and above.
- Diagnosed with cirrhosis of the liver based on established diagnostic criteria.
- Admitted to the Medicine Ward of Navodaya Medical College, Raichur.

Exclusion Criteria:

- Patients with hepatocellular carcinoma.
- Patients with portal vein thrombosis.
- Patients under treatment with beta blockers, diuretics, or vasoactive drugs within the last three weeks.
- Patients with Budd–Chiari syndrome or non-cirrhotic portal hypertension.
- Patients with a previous history of abdominal surgery.
- Patients who have undergone sclerotherapy or endoscopic variceal ligation for varices.
- Patients with hemoglobinopathies or primary coagulopathies.
- Patients unwilling to participate in the study

Sample Size

The sample size was calculated based on the formula used for sample size calculation for case control study . n = z2 pq/d2
where z = 1.96 (confidence limit at 95%)
p= prevalence 74 %(incidence of oesophageal varices among chronic liver disease from previous study)
q= 100-p(100- 74)=26
d = allowable error (absolute error of 10) and n is sample size by substituting the values in the above formula ,sample size obtained was 114

Sampling Procedure

All chronic liver disease patients diagnosed by clinical examination, abdominal ultrasound, portal vein Doppler, and other necessary

investigations, and meeting the inclusion and exclusion criteria, were selected for the study.

Statistical Analysis

Receiver Operating Characteristic (ROC) curves were used to determine the platelet count/spleen diameter ratio with the best sensitivity and specificity for predicting oesophageal varices. A p-value of < 0.05 was considered statistically significant.

RESULTS/ DISCUSSION

This hospital-based cross-sectional study was conducted in the Department of Medicine, Navodaya Medical College and Hospital, Raichur, over a period of one year. A total of 114 patients diagnosed with liver cirrhosis and meeting the study criteria were included. Patient details were recorded and analyzed.

Using a cut-off value of platelet count/splenic diameter ratio of 1052, the Areas Under the ROC Curve (AUC) were as follows:

Platelet count: 0.984

Splenic diameter: 0.783

Platelet count/splenic diameter ratio: 0.986

The highest AUC (0.986) was observed for the platelet count/splenic diameter ratio, with a sensitivity of 97.12% and specificity of 100.00%, indicating strong statistical significance. This demonstrates that the platelet count/splenic diameter ratio is the best predictor of oesophageal varices severity in cirrhosis patients. Furthermore, the study findings indicate that as this ratio decreases, the grade of varices increases.

Test parameter	Cut off points	Area under curve	Sensitivity (1%)	Specificity (1%)	Standard error	95% confidence interval
Platelet count	<120 10X3/ul	0.984	96.15	100	0.010	0.941-0.998
Splenic diameter	>134mm	0.783	79.81	60	0.097	0.696-0.854
Platelet count/ splenic diameter ratio	≤1052.63	0.986	97.12	100	0.010	0.943-0.999

CONCLUSION

The platelet count/splenic diameter ratio can be a useful predictor of oesophageal varices in patients requiring frequent endoscopies. However, geographical variations in platelet count and spleen size may influence the cut-off value. Larger studies are needed to validate this ratio and establish a universally applicable cut-off for the non-invasive diagnosis of oesophageal varices.

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