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Original Research Article

TO VALIDATE THE PLATELET COUNT/SPLEEN DIAMETER RATIO IN PREDICTING LARGE ESOPHAGEAL VARICES.

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Abstract

Background & Methods: The aim of the study is to validate the platelet count/spleen diameter ratio in predicting large esophageal varices. All the patients in the study will be subjected to biochemical tests like liver function tests, CBC, renal function tests, prothrombin time, INR and ultrasonographic examination of abdomen to confirm the presence of chronic liver disease and to record spleen diameter, portal vein diameter and ascites. Screening for esophageal varices will be done by upper GI endoscopy.

Results: In endoscopy 47.9% of CLD patients were detected with large esophageal varices and 22.3% with small esophageal varices. On the basis of platelet/spleen ratio, 100% sensitivity and 98% specificity were achieved to detect esophageal varices with a cutoff limit of 850.

Conclusion: Applying the "platelet count/spleen diameter ratio" for the detection of esophageal varices seems to be more cost effective than the "scope all strategy". It may permit institution of prophylactic measures like beta-adrenergic antagonists for preventing primary variceal bleeding in patients with chronic liver disease, without the need of costly and invasive investigations like upper GI endoscopy.

Keywords: platelet, predicting, esophageal & varices.
Study Design: Observational Study.

1. Introduction

Chronic liver disease is a process of progressive destruction and regeneration of the liver parenchyma which leads to fibrosis and cirrhosis. Cirrhosis is defined histo-pathologically and has a variety of clinical manifestations and complications, some of which can be life-threatening[1]. In the past, it was thought that cirrhosis was never reversible; however, it became apparent that when the underlying insult that has caused the cirrhosis has been removed, there can be reversal of fibrosis. This is apparent with the successful treatment of chronic hepatitis C; however, reversal of fibrosis is also seen with patients of

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hemochromatosis who were successfully treated and in patients with alcohol associated liver disease who discontinued alcohol use[2].

Despite significant improvements in early diagnosis and advancements made in the treatment modalities, the mortality rate of first variceal hemorrhage is still high (48%)[3]. Many studies have demonstrated the significance of pharmacologic therapy for primary prevention of variceal bleeding; emphasizing the importance of screening endoscopy in all newly diagnosed cirrhotic patients for the presence of varices.

Patients with compensated cirrhosis without varices in the absence of any ongoing liver injury, endoscopy should be done every three years. Those with compensated cirrhosis without varices, but have an ongoing liver injury screening is repeated every two years. Patients with small varices without ongoing liver injury endoscopy is recommended every two years and every year if ongoing liver injury present[4]. Patients with large size varices should be started with nonselective beta blockers or considered for EVL. If the patient is on nonselective beta-blockers, no further surveillance endoscopy is needed. On the other hand, if EVL is considered for primary prophylaxis endoscopy is advocated every 1-2 weeks until eradication and then repeated every 6-12 months[5]. But this test is limited as it is invasive, costly and poorly accepted by patients. Therefore, there is a particular need for the identification of noninvasive parameters that strongly predict the presence of esophageal varices. Hence by this study we are trying to evaluate the utility of platelet count/spleen diameter ratio for predicting the presence of esophageal varices in patients with portal hypertension[6-7].

2. Material and Methods

The study entitled to validate platelet count/spleen diameter ratio in predicting the presence of large esophageal varices was carried out in the Department of Medicine in J.A. Group of Hospitals, Gwalior on an inpatient basis from January 2021 to August 2022. A detailed history and physical examination was done and findings were recorded. All the patients in the study were subjected to biochemical tests like liver function tests, CBC, renal function tests, prothrombin time, INR and ultrasonographic examination of abdomen to confirm the presence of chronic liver disease and to record spleen diameter, portal vein diameter and ascites. Screening for esophageal varices was done by upper GI endoscopy.

The study was a hospital based observational study which included indoor patients diagnosed as chronic liver disease based on clinical, biochemical and radiological findings. All the patients were screened for esophageal varices by means of upper GI endoscopy. The study comprises of 94 patients admitted in Department of Medicine, J.A. Group of Hospitals.

Inclusion criteria:

- Age more than 18 years.
- Chronic Liver disease with portal hypertension

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Exclusion criteria:

- **Cases of**

- History of parenteral drug addiction.
- Previous surgical intervention for portal hypertension
- Advanced co-morbidity for endoscopy

• Subjects who do not provide consent for the study.

3. Result

Table 1: Etiology, and sign of chronic liver diseases

		Frequency	Percent
Etiology	Alcohol	49	52.1
	Hepatitis B	15	16.0
	Hepatitis C	4	4.3
	Others	26	27.7
Ascites	Mild	19	20.2
	Moderate	35	37.2
	Massive	27	28.7
	None	13	13.8
Encephalopathy	No	82	87.2
	Yes	12	12.8

Alcohol was found most common etiology for CLD and more than half (52.1%) enrolled participants were having alcoholic liver cirrhosis. Viral hepatitis (Hepatitis B and C) was second leading cause of liver cirrhosis and other causes accounts for more than 27% in the present study. 20.2% participants were having mild ascites, 37.2% were having moderate and 28.7% participants were presented with massive Ascites. 13.8% patients of CLD not presented with ascites. Encephalopathy was found in 12.8% of participants.

Table 2: Endoscopy finding

Endoscopy finding	Frequency	Percent
Large	45	47.9%
Small	21	22.3%
Normal	28	29.8%

In endoscopy 47.9% of CLD patients were detected with large esophageal varices and 22.3% with small esophageal varices.

Table 3: Association of esophageal varices size with Platelet count/spleen diameter ratio

Variable	**Large**	**Small**	**Normal**	**p value**
Platelet/spleen diameter	698.22±78.92	1734.06±1716.75	2898.12±513.34	<0.001

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Platelet count/ spleen diameter ratio was found statistically different between size of esophageal varices. A decrease in Platelet count/ spleen diameter ratio was found to be associated with large esophageal varices.

Table 4: Platelet/Spleen Ratio vs Esophageal varices

Platelet/Spleen Ratio	Oesophageal Varices		
	Yes	No	Total
<850	45 (100%)	1 (2%)	46 (51.1%)
≥850	0 (0%)	48 (98%)	48 (48.9%)
Total	45 (100%)	49 (100%)	94 (100%)

On the basis of platelet/spleen ratio, 100% sensitivity and 98% specificity were achieved to detect esophageal varices with a cutoff limit of 850.

4. Discussion

In E Giannini *et al.*'s[8] study of 266 patients, the prevalence rates of esophageal varices were 61% and 58% in the first and second group of patients, respectively. In a multivariate analysis, platelet count/spleen diameter ratio was the only parameter which was independently associated with the presence of esophageal varices. A platelet count/spleen diameter ratio cut off value of 909 had 100% negative predictive value for the diagnosis of esophageal varices. In a cost-benefit analysis, screening cirrhotic patients according to the "platelet count/spleen diameter ratio" was far more cost effective as compared with the "scope all strategy".

Ehab A. A. Elatty et al[9] conducted a study among 120 cirrhosis patients and divided them into three groups- 40 cirrhotic patients with esophageal varices and a history of upper gastrointestinal bleeding, 40 cirrhotic patients with esophageal varices without a history of upper gastrointestinal bleeding, and 40 cirrhotic patients without esophageal varices. Serum albumin at cut-off less than 3.65 g/dl, platelet count at cut-off less than 99 000/mm^3, platelet count/spleen diameter ratio (PC/SD) at cut-off less than 919.6, aspartate aminotransferase-to-platelet ratio index at cut-off greater than 1.14, spleen longitudinal diameter at cut-off more than 140.5 mm, portal vein diameter at cut-off more than 15.2 mm, and prothrombin time at cut-off more than 15.1s are significant in the prediction of esophageal varices[10].

In our study, the analysis of the noninvasive predictors were based on the maximum diameter of spleen measured in centimeters using abdominal ultrasound and the platelet count. These two parameters were used to calculate the Platelet count/spleen diameter ratio. The derived measure platelet count to spleen diameter considered in our study showed a 100% sensitivity and 98% specificity to detect esophageal varices at a cut off limit of 850.

The use of the Platelet count/spleen diameter ratio can be a lower-cost and more effective method to identify esophageal varices in patients with portal hypertension. The ideal tool should have high sensitivity and specificity as close to 100% to obtain an accurate profile and to avoid endoscopy in patients without esophageal varices[11]. Hence the platelet count / spleen diameter ratio can be considered for identifying large esophageal varices that are at risk.

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5. Conclusion

The platelet count/spleen diameter ratio for the detection of esophageal varices seems to be more cost effective than the "scope all strategy". It may permit institution of prophylactic measures like beta-adrenergic antagonists for preventing primary variceal bleeding in patients with chronic liver disease, without the need of costly and invasive investigations like upper GI endoscopy.

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