



PREDICTION OF ESOPHAGEAL VARICES IN COMPENSATED CHRONIC LIVER DISEASE PATIENTS BY USING FIBROSCAN, SPLEEN SIZE AND PLATELET COUNT

Gastroenterology

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ABSTRACT

Background - In this study, we aim to identify the noninvasive methods like Fibroscan, spleen size, platelet count, and their combinations in correlating and predicting esophageal varices.

Methods - This observational study includes patients diagnosed with Compensated Chronic liver disease presented for the first time. Relevant physical examination and clinical parameters were assessed, including complete hemogram, biochemical workup, liver stiffness using Fibroscan, USG measurement of spleen long axis diameter, Upper GI endoscopy for variceal screening, and grading.

Results - A significant correlation between platelet count and the presence of varices was noted ($P < 0.001$), with a cut-off count of $150 \times 10^9/L$, with a sensitivity of 88.9% and a specificity of 97.2%. And for high-risk varices the optimal Cut-off was $128 \times 10^9/L$.

The Cut-off point for Spleen diameter for the presence of varices was 14.15cm with 94.7% sensitivity and 84.1% specificity with a significant p-value < 0.001 . High-risk varices optimal Cut-off was 14.65cm. Similarly, the best cut-off point for liver stiffness and the presence of varices was 21kPa, with a sensitivity of 96.0% and a specificity of 97.4% with a significant p-value < 0.001 , and for high-risk varices was 25.5kPa. A statistically significant correlation was observed between the Liver stiffness spleen diameter platelet score (LSPS) in predicting varices and high-risk varices with the best cut-off value of 2.05 and 3.11, respectively.

Conclusion - Our study concludes that Fibroscan, Spleen Size, and platelet count, individually and Combined LSP Score is a valuable tool in predicting the presence of esophageal varices and severity. From all these parameters, we could identify the subset of patients who require endoscopy screening for esophageal varices.

KEYWORDS

esophageal varices, fibroscan, spleen size and platelet count.

INTRODUCTION

For patients with compensated cirrhosis and without varices –repeat endoscopy is recommended every 2-3 years. For patients with small varices, endoscopy is repeated every 1-2 years. For patients with decompensated cirrhosis, endoscopy is done at yearly intervals. However, endoscopy is a tool that is invasive and not cost-effective. It may be better cost-effective if only high-risk beneficiaries undergo routine screening for the presence of varices hence reducing the inconvenience of patients and endoscopy units.

Currently, many noninvasive methods have been used to predict the presence of esophageal varices. Overall, the most common result of these studies shows that large spleen size, low platelet count, Fibroscan, portal vein size or presence of collaterals on Ultrasound, and child-pugh score were the predictors of esophageal varices either directly or indirectly linked to portal hypertension [1].

Our study aimed to predict esophageal varices using noninvasive tools like Fibroscan, spleen size, and platelet count.

METHODS

This observational study includes patients diagnosed with Compensated Chronic liver disease presented for the first time. The study period is from 1st October 2019 to 31st September 2020. Relevant physical examination and clinical parameters were assessed, including complete hemogram, biochemical workup, PT-INR, liver stiffness using Fibroscan, USG measurement of spleen long axis diameter, Upper GI endoscopy for variceal screening, and grading. Liver stiffness Spleen Platelet Score (LSPS) was calculated for all patients.

RESULTS

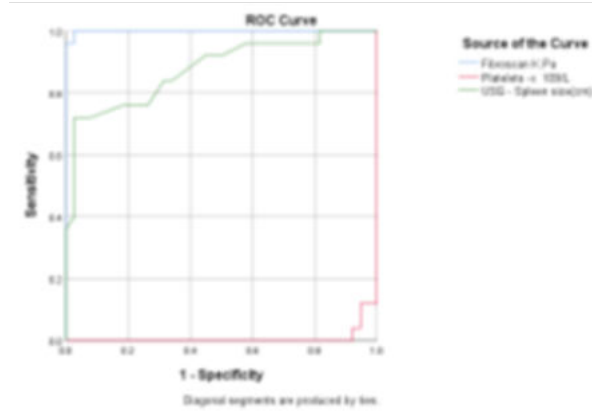
Association Of Various Parameters Between Two Groups:-

Parameters	Variceal group (n=38)	Non- Variceal group (n=23)	P-value
Age(years)	47.50(+/-9.5)	49.5(+/-9.0)	0.611

BMI	23.1 (+/-1.02)	23.25 (+/- 1.32)	0.387
S. Bilirubin	1.69 (+/- 0.48)	1.99(+/- .56)	0.28
AST (units/L)	40.76 (+/-14.15)	45.13 (+/-15.36)	0.36
ALT (units/L)	43.0 (+/-7.09)	45.25 (+/-8.83)	0.40
PT- INR (ratio)	1.10 (+/- 0.14)	1.25 (+/- 0.23)	0.001
S. Creatinine (mg/dl)	0.86 (+/- 0.14)	0.90 (+/-0.15)	0.092
S. Sodium (mEq/L)	137.26 (+/-3.53)	136.84 (+/-3.16)	0.133
S. Albumin (g/dl)	3.41 (+/- 0.32)	3.228 (+/- 0.37)	0.007
CTP Score	5.66	7.84	0.000
MELD	9.68 (+/- 1.73)	15.44 (+/-2.0)	0.000
Platelet ($\times 10^9/L$)	174.8 (+/- 16.23)	123.04 (+/-17.27)	0.05
Spleen Size (cm)	13.195 (+/-0.84)	14.68 (+/-1.04)	0.05
Fibroscan (kPa)	17.75(+/- 1.98)	25.81 (+/-3.93)	0.05
LSPS	1.37(+/- 0.29)	3.25 (+/-1.07)	0.04

The Receiver operating characteristic curve (ROC curve) was drawn for platelet count, spleen size, and Fibroscan Liver stiffness value for endoscopy finding of varices; discrimination threshold was estimated by a point of maximum Sensitivity and Specificity. This discrimination threshold was taken as a cut-off point to differentiate the presence and absence of varices.

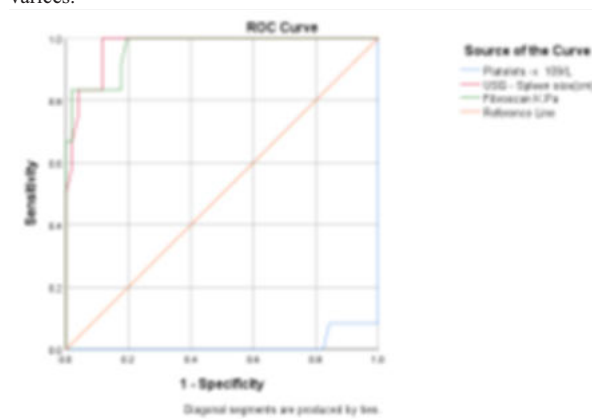
The ROC curve analysis for Platelets and Esophageal varices has shown discrimination threshold corresponds to a platelet count of 150. The cut-off value is taken as 150; Sensitivity for the presence of Esophageal Varices is 88.9%, and the specificity is 97.2%, and the p-value is < 0.001 .



The discrimination threshold for Spleen size for the presence of Esophageal Varices is 14.15cm. Hence Cut-off value for spleen diameter for predict varices is 14.15cm with 94.7% sensitivity and 84.1% Specificity. The P-value is <0.0001.

The ROC curve drawn for Fibroscan young module values and Esophageal varices presence shows a discrimination threshold as 21.0 kPa. Hence it is taken as a Cut-off value for Fibroscan liver stiffness for Prediction of Esophageal Varices. The sensitivity is 96.0%, and the specificity is 97.4%, with a significant p-value of <0.0001.

ROC curve analysis has drawn for Platelets, Spleen size, and Fibroscan liver stiffness value for High-risk varices observed in endoscopy. And the discrimination threshold is taken as the cut-off value for the presence of high-risk varices.



Liver Stiffness (kPa) x Spleen Size(cm)/Platelets (x 109/L)

The LSPS calculated by the formula mentioned above, and the mean LSPS in the patients with varices is 3.25, in comparison with patients with no varices 1.37. Chisquare shows the significance with a p-value of 0.045. The mean LSPS for the patients with High-risk varices is 4.10. Based on the discrimination threshold, the Cut-off value for LSPS in predicting Esophageal Varices is 2.05 with a sensitivity of 98% and a Specificity of 97%, and significance p-value 0.001. Similarly, the Cut-off value for the LSPS for the presence of high-risk varices is 3.11 with 96.7 % sensitivity and 93.5 % Specificity. p-value is 0.0001 .

DISCUSSION

Among the 63 patients studied, Males(44) predominates with alcohol (40%) as the most common Etiology. In the study population, varices present in 25 patients(40%) with 14 patients with low-grade varices and 11 patients with high-risk varices.

A significant correlation between platelet count and the presence of varices was noted ($P < 0.001$), with a cut-off count of $150 \times 10^9/L$, with a sensitivity of 88.9% and a specificity of 97.2%, And for high-risk varices, the optimal Cut-off was $128 \times 10^9/L$.

The Cut-off point for Spleen diameter for the presence of varices was 14.15cm with 94.7% sensitivity and 84.1% specificity with a

significant p-value < 0.001. High-risk varices optimal Cut-off was 14.65cm.

Similarly, the best cut-off point for liver stiffness and the presence of varices was 21kPa, with a sensitivity of 96.0% and a specificity of 97.4% with a significant p-value < 0.001, and for high-risk varices was 25.5kPa.

A statistically significant correlation was observed between the Liver stiffness spleen diameter platelet score (LSPS) in predicting varices and high-risk varices with the best cut-off value of 2.05 and 3.11, respectively.

CONCLUSION:

Our study concludes that Fibroscan, Spleen Size, and platelet count, individually and Combined LSP Score is a valuable tool in predicting the presence of esophageal varices and severity. From all these parameters, we could identify the subset of patients who require endoscopy screening for esophageal varices. Thus, endoscopy can be safely avoided, reducing endoscopy units' burden and a financial burden. These Parameters are noninvasive and also help in Monitoring the disease.

REFERENCES:

1. De Franchis et al. Diagnosis and monitoring of portal hypertension. *Dig Liver Dis*. May 2008; 40(5):312-7.