**INTRODUCTION:**
Variceal bleeding is a common and the most serious complication of liver cirrhosis. Endoscopy is recommended for diagnosis and surveillance of esophageal and gastric varices. We used a non-invasive scoring method of severity of liver disease and examined whether it can reliably predict the presence and severity of varices.

**METHODS:** Study was carried out over a period of 12 months including all cirrhosis patients. Fibroscan and FIB-4 score were used to formulate a non-invasive score and compared with endoscopic findings.

**RESULTS:** The presence of varices and its severity correlated with Fibroscan+FIB-4 score. Higher the score, higher the likelihood of varices requiring endoscopic intervention. A score of >6 can be used as cut off to stratify patients requiring endoscopy.

**Conclusions:** Fibroscan + FIB-4 score can be reliably used as a marker of presence of varices, the severity and chances of bleeding from varices. This can be of importance in the present Covid-19 pandemic, where in upper GI endoscopic procedures carry the highest rate of infection to healthcare workers and patients.

**KEYWORDS**
Fibroscan, FIB-4 score, Varices, endoscopy, cirrhosis

**ABSTRACT**
Background: Variceal bleeding is the most dangerous complication of liver cirrhosis. Endoscopy is recommended for diagnosis and surveillance of esophageal and gastric varices. We used a non-invasive scoring method of severity of liver disease and examined whether it can reliably predict the presence and severity of varices.

Methods: Study was carried over a period of 12 months including all cirrhosis patients. Fibroscan and FIB-4 score were used to formulate a non-invasive score and compared with endoscopic findings.

Results: The presence of varices and its severity correlated with Fibroscan+FIB-4 score. Higher the score, higher the likelihood of varices requiring endoscopic intervention. A score of >6 can be used as cut off to stratify patients requiring endoscopy.

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**RESULTS**

**FIBROSCAN**

| FIB-4 | No. of patients | Score |
|---|---|---|
| <1.45 | 0 | 0 |
| 1.45-3.25 | 11 | 2 |
| >3.25 | 39 | 4 |

**CUMULATIVE SCORE (FIBROSCAN + FIB-4 SCORE)**

| SCORE | No. of patients |
|---|---|
| 0 | 0 |
| 2 | 0 |
| 4 | 11 |
| 6 | 17 |
| 8 | 20 |
| 10 | 2 |

**ENDOSCOPIC ASSESSMENT OF VARICEAL SEVERITY**

| Parameter | Score assigned |
|---|---|
| SIZE | 1 |
| Medium (25-50% lumen) | 2 |
| Large (>50% lumen) | 3 |
| RED WALE SIGNS | 1 |
| Absent | 0 |
| Mild | 1 |
| Moderate | 2 |
| Severe | 3 |
| Presence of Gastric varices | 1 |
| Yes | 2 |
| No | 0 |

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DISCUSSION:
The FIB-4 scoring system uses a combination of patient age, platelet count, AST and ALT. The scoring system creates a score - <1.45 has a negative predictive value of over 90% for advanced liver fibrosis. A score of >3.25 has a positive predictive value of 65% for advanced fibrosis with a specificity of 97%\(^\text{5}\). The maximum FIB-4 grade was 4 while the minimum was 0. No patient had 0 score as all of them were diagnosed cirrhotic. Of the 50 patients, 11(22%) had a FIB-4 score of 2, remaining 39(78%) had a score of 4.

Fibroscan grading of severity of liver disease varies with the etiology of the liver cirrhosis\(^\text{6}\) but the broad range of values has been taken to assign the fibroscan score to avoid unclassifiable total scores which might present difficulty in comparing with endoscopic variceal grades. All 50 patients were classified from F0-F4 based on fibroscan value and score was assigned. 9 patients had F2, 16 patients had F3 and 25 patients had F4 grade. They were assigned fibroscan scores of 2,4 and 6 respectively. None of the patients had F0-1 as all of them has cirrhosis diagnosed prior.

A cumulative score was calculated adding both parameters - 11 patients had a cumulative score of 4, 17 had a score of 6, 20 had a score of 8 and 2 patients had a score of 10.

The cumulative non invasive scores i.e, Fibroscan + FIB-4 scores were then compared with endoscopic scores of variceal presence and severity.

Endoscopic assessment of variceal grading of severity was done Risk class prediction as per the North Italian Endoscopic Club Classification\(^\text{7}\) and a score was assigned to each patient. The maximum possible score was 8.

On analysis, 11 patients had an endoscopic score of 3-4 and a cumulative non-invasive score of 4. 17 patients had an endoscopic score of 4-5 and a cumulative non-invasive score of 6. 20 patients had an endoscopic score of 5-7 and a cumulative non-invasive score of 8. 2 patients had an endoscopic score of 7 and a cumulative non-invasive score of 10.

This clearly suggests, higher the cumulative Fibroscan+FIB-4 score prior to endoscopy, higher the chances of presence of varices and, more the severity of varices. Hence Fibroscan + FIB-4 score can be reliably used as a marker of presence of esophageal and gastric varices, the severity and chances of bleeding from varices. This can be of special importance in the present Covid-19 pandemic, where in upper GI endoscopic procedures carry the highest rate of infection\(^\text{8}\) to healthcare workers and patients.

The above score can be used to stratify all newly diagnosed liver cirrhosis patients and endoscopy for variceal detection and treatment of the same be undertaken in cases where the score is atleast greater than 6.

The same scores can also be used to predict chances of rebleeding and need for follow up endoscopies and further studies are needed in this area.

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| FIBROSCAN+FIB-4 SCORE | No. OF PATIENTS | AVERAGE ENDOSCOPIC SCORE |
|----------------------|----------------|--------------------------|
| 0                    | 0              | 0                        |
| 2                    | 0              | 0                        |
| 4                    | 11             | 3-4                      |
| 6                    | 17             | 4-5                      |
| 8                    | 20             | 5-7                      |
| 10                   | 2              | 7                        |