



Blood Indices Replace Upper Gastrointestinal Endoscopy for the Prediction of Clinically Significant Esophageal Varices in Liver Cirrhosis

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ABSTRACT

Background and aim: Anticipating the existence of esophageal varices (EVs) by non-intrusive methods in cirrhotic may build consistency and limit the presentation of upper gastrointestinal endoscopy (UGIE) to those individuals with a high likelihood of having EVs. Prophecy of EVs utilizing simple blood indices and also for estimation of clinically important large esophageal varices (LEVs).

Materials and methods: A cross-sectional experimental examination was done on 107 cirrhotic enlisted sequentially. Platelet count (PC), the ratio of aspartate aminotransferase to alanine aminotransferase (the AST/ALT ratio or AAR), AST-platelet-ratio index (APRI), Fib-4, and King's Score were determined and linked with UGIE discoveries taken as the best quality level. The execution manifested affectability, particularity, positive and negative prescient values (PPV, NPV), and area under the curve (AUC).

Results: Middle age 44 years, male (90%), and etiology-ethanol (87%). 60/107 had LEVs. For anticipating LEVs, PC at cutoff esteem < 1.5 lakhs c/mm3 exhibited affectability 66.7%; particularity 44.7%, PPV 60.6%, NPV 51.2%, and AUC 0.621. AAR for estimation of LEVs at cutoff esteem 1, showed affectability 93.3%, particularity 42.1%, PPV 54.9%, NPV 20% and AUC 0.638. Lie 4 for expectation of LEVs at cutoff esteem 3.5, showed affectability 80%, and particularity 31.9%, PPV 60%, NPV 55.6% and AUC 0.614.

Conclusion: PC, AAR, and FIB-4 had simple demonstrative precision for LEVs in cirrhosis. They recognized the subcategory that requires UGIE for the preventive administration of EVs. Generally, basic blood lists probably will not have the option to substitute the efficacy of UGIE for the finding of EVs in cirrhosis.

1. Introduction

The Advancement of oesophageal varices is one of the significant problems of portal hypertension.^[1] The commonness of gastro-oesophageal varices goes from 0-40% in expiated cirrhosis to 70-80% in de-expiated cirrhosis, whereas their development and evolution happen at an expected 7% per year.^[2,3] Numerous examinations have revealed that biochemical, clinical, and ultrasound boundaries alone or together have great prescient force for non-obtrusively evaluating the occurrence of oesophageal varices (EV's).^[4-11] Upper GI endoscopy is considered the highest quality level against which any remaining tests are analyzed. However, it is for certain constraints. Thus, these non-intrusive indicators might be utilized to alter the idea of universal endoscopy to specific endoscopy in cirrhotic. It will help developing nations like India, where endoscopy is not all-around accessible and keeps from pointless intrusive strategies, which has a few faults.

2. Materials and methods

This investigation was directed at the southern piece of India. A cross-sectional investigation was directed from November 2017 to May 2019, comprised 107 instances of liver cirrhosis of any cause, conceded as in-patients in hospitals connected to Bangalore Medical College and Research Institute, Bangalore Karnataka. Patients were chosen based on the presence and avoidance norms referenced underneath. For every persistent, the accompanying information was gathered: age, gender, cause of cirrhosis, abdominal ultrasound discoveries, complete blood picture, liver function test, prothrombin time, International Normalized Ratio (INR), upper gastrointestinal endoscopic findings. Inclusion standards were patients able to take part after well versed written assent, matured over 18 years, cirrhosis of any cause - analyzed reliant on clinical and ultrasound premise. Avoidance norms were history or clinical proof of proclamation for variceal bleed, Liver

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transfer, hepatocellular cancer analyzed dependent on ultrasound premise, current acute myocardial localized necrosis, acute inflammation of the pancreas, intense febrile ailment like dengue fever, intestinal sickness. Our investigation was meant to approve the meaning of scoring frameworks like AST-to-ALT proportion (AAR), AST-to-platelet-proportion record (APRI), fibrosis index dependent on the four factors (FIB-4), King's Score, and Platelet Count.^[12] Non-obtrusive boundaries have corresponded with upper gastrointestinal endoscopy discoveries, taken as the highest quality level. The example study was directed utilizing IBM SPSS insights version 23 for Windows. For every individual, the score was determined utilizing the mentioned equation:

- 1. $AAR = (AST/ALT)$
- 2. $APRI = [(AST / ULN AST) \times 100] / Platelets (109/L)$
- 3. $FIB-4 = Age(years) \times AST(U/L) / PLT (109/L) \times \sqrt{ALT (U/L)}$
- 4. King's score = $[Age \times AST \times INR / Platelets (109/L)]$

3. Results

A sum of 107 cirrhotic patients took an interest in cross-sectional experimental examination. The middle age of patients was 44 years, with 90.65% of male patients. The most regular cause was ethanol incited (86.92%), as demonstrated in Fig. 1. LEVs were seen in 56% of the patients, as demonstrated in Fig. 2. The independent example Mann-Whitney U test presented a critical distinction between two gatherings for AAR, FIB-4, and Platelet tally while APRI and King's scores were unimportant, as demonstrated in Table 1. The two followed spearman's relationship exposed a huge connection in AAR, FIB-4, and Platelet Count. ROC of all the scoring boundaries has appeared in Figs. 3-7. Affectability, particularity, positive and negative prognostic values (PPV, NPV), and area under the curve (AUC) are labeled in Table 1.

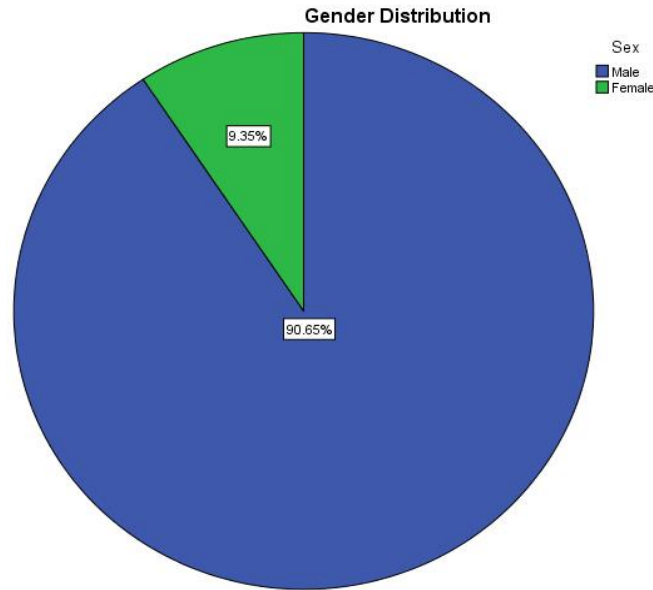


Fig 1. Etiologic distribution of patients.

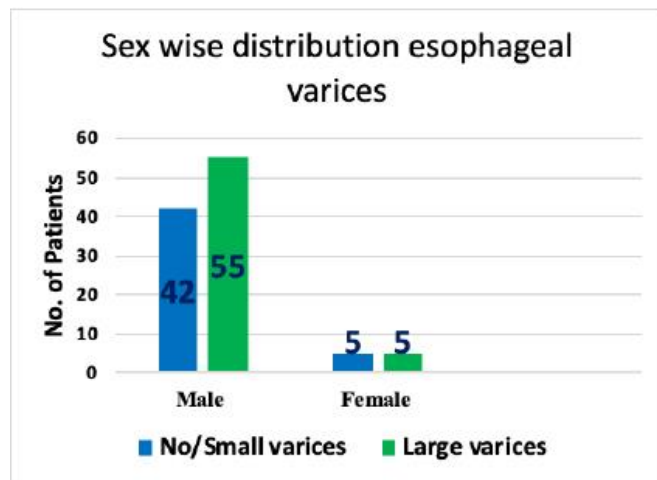
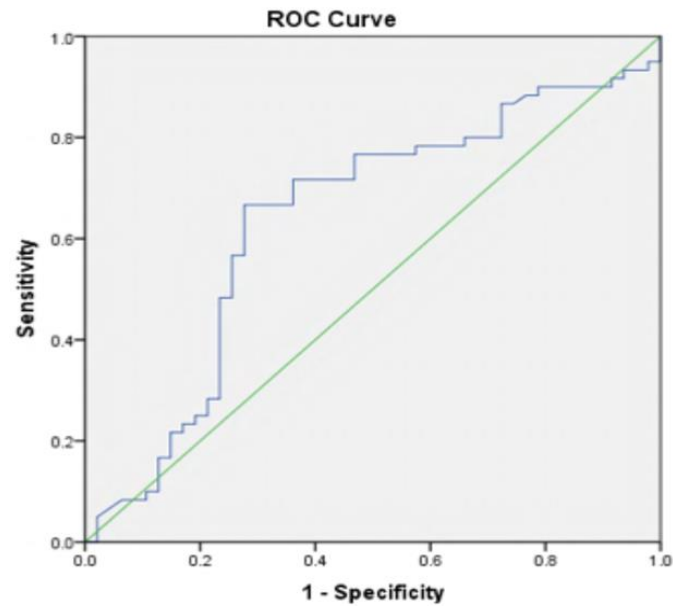
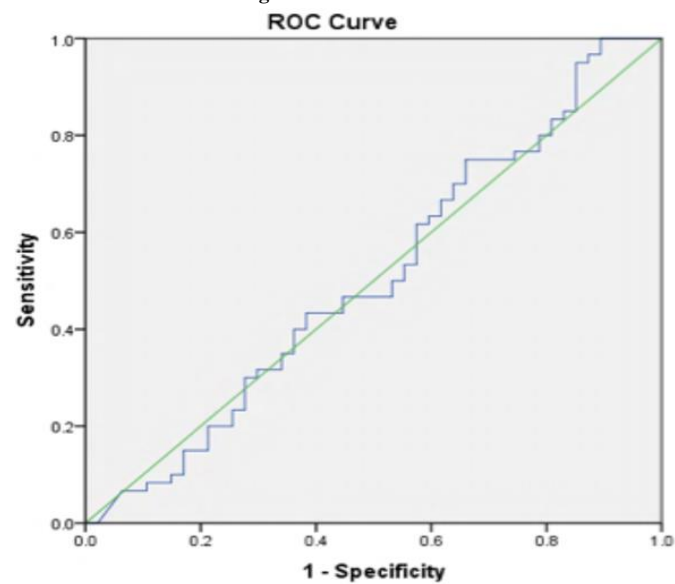


Fig 2. Upper GI Endoscopy findings.

Table 1. Presentation of non-invasive indicators for estimation of clinically substantial/large esophageal varices.

Variable	Cut-off value	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)	The area under the curve (AUC)	P-value
AAR	1.0	93.3	42.1	54.9	20	0.638	0.015
APRI	1.4	56.7	42.6	55.7	43.5	0.507	0.900
FIB-4	3.5	80	31.9	60	55.6	0.614	0.044
KING score	40	65	36.2	56.5	44.7	0.524	0.800
Platelet count	150	66.7	44.7	60.6	51.2	0.621	0.032

**Fig. 3. ROC curve for AAR.****Fig. 4. ROC curve for APRI.**

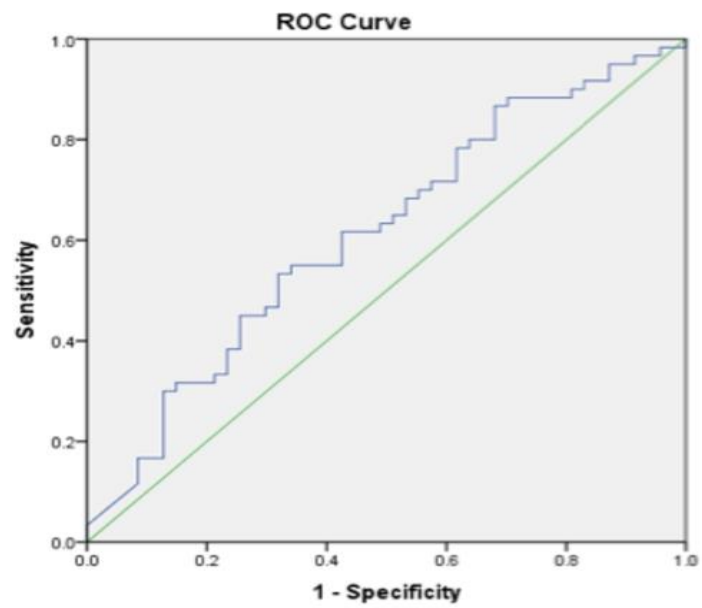


Fig. 5. ROC curve for FIB-4 score.

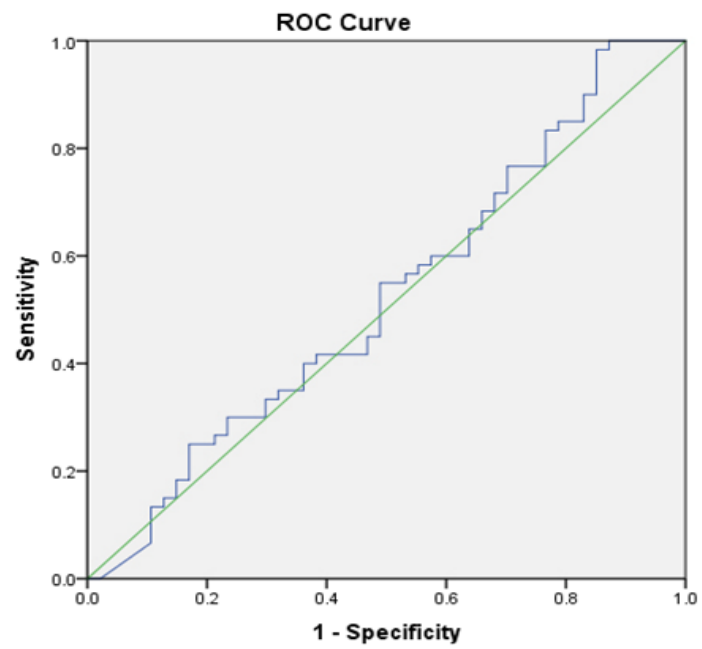


Fig. 6. ROC curve for King's score.

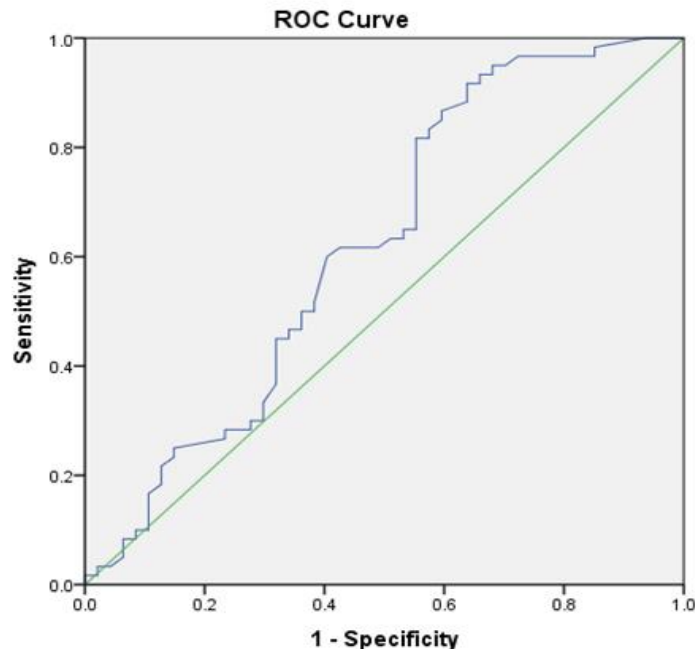


Fig. 7. ROC Curve for Platelet count.

4. Discussion

Upper Gastrointestinal (GI) bleeding is a typical and possibly dangerous issue. Generous mortality and morbidity related to the condition have been high for quite a while. Numerous Indian investigations distributed as of late with enormous example size say the occurrence of hematemesis secondary to varices are rising.^[12] Esophageal variceal bleeding is a possible deadly impediment in liver cirrhosis individuals, with the frequency of variceal bleeding being 35-80%. The danger of mortality related to the first incident of variceal bleeding reaches from 17-57%. Therefore, early recognition of oesophageal varices and managing the patients with beta-blockers or variceal band ligation can limit the complexity. As per the BAVENO III agreement, upper GI endoscopy is generally finished for each instance of cirrhosis.^[12] anyhow, screening whole patients with endoscopy might be an obtrusive and expensive analytic method. Hence, there is a requirement for non-obtrusive boundaries to identify oesophageal varices to facilitate the financial, social, and clinical load of infection over the general public. Various research centres and ultrasound-dependent techniques have been produced for non-intrusive symptomatic assessment of cirrhosis/portal hypertension/oesophageal varices, for example, Platelet check, splenomegaly, platelet count/splenic measurement, serum albumin, Right liver lobe distance across/albumin proportion, and progressed child Pugh group. To foresee oesophageal varices, many scoring frameworks were likewise evolved utilizing straightforward blood limitations. Our investigation attempted to approve the importance of scoring frameworks like AAR, APRI, FIB-4, and King's Score.

Our investigation involved patients aged over 18 years; a greater part of them had a place with the age bunch 40-59 years (56%). The middle age of the investigation subjects was 42.5 years which is practically identical to that of Hesham et al. study^[13] Majority of the patients were males, who comprised 90.65% while females were 9.35% this is similar to concentrates by Hesham et al. 13 and Alempijevic T et al.^[14] as these examinations had dominantly male subjects. Most of the patients in our examination had ethanol as the cause of cirrhosis which comprised 86.92 % (n=93). Among non-alcoholic, 13.08% of patients had NAFLD as the significant reason for liver cirrhosis (n=10). Platelet check (PC) - almost all of the investigation individuals had a

platelet count of < 1.5 lakhs c/mm^3 (64%), most of the examination individuals had enormous varices with a platelet count of under 1.5 lakhs c/mm^3 (40%). It is analogous with the investigation directed by Madhotra et al.,^[15] where the platelet count includes patients with oesophageal varices from 0.53-1.05 lakhs c/mm^3 . The relationship between enormous oesophageal varices and platelet count was discovered to be genuinely critical (p esteem – 0.032). For aspartate aminotransferase and alanine aminotransferase proportion (AAR) - remove esteem was 1.0. Affectability, explicitness, positive prescient value (PPV), and prescient negative value (NPV) were 93.3%, 42.1%, 54.9%, and 20% separately, which is analogous to the examination by Sebastiani et al.^[16] The area under the curve (AUC) was 0.638. The connection among enormous oesophageal varices and AAR was discovered to be measurably noteworthy (p esteem – 0.015). For aspartate aminotransferase to platelet proportion file (APRI) - remove esteem was 1.4. Affectability, particularity, positive prescient value (PPV), and prescient negative value (NPV) were 56.7%, 42.6%, 55.7%, and 43.5% individually, which is equivalent to the investigation by Deng et al.^[17] The area under the curve (AUC) was 0.507. The connection between enormous oesophageal varices and APRI was genuinely non-critical (p esteem – 0.900). For fibrosis file dependent on the four factors (FIB-4) - remove esteem was 3.5. Affectability, particularity, positive prescient value (PPV), and prescient negative value (NPV) were 80%, 31.9%, 60%, and 55.6% separately, which is tantamount to the examination by Kraja et al.^[18] The area under bend (AUC) was 0.614. The connection between enormous oesophageal varices and FIB-4 was discovered to be genuinely critical (p esteem – 0.044). For King's score - remove esteem was 40. Affectability, particularity, positive prescient value (PPV) and negative prescient value (NPV) were 65%, 36.2%, 56.5% and 44.7% separately. The area under the curve (AUC) was 0.524. The connection between enormous esophageal varices and King's score was discovered to be measurably non-critical (p esteem – 0.800).

5. Conclusion

We infer that PC, AAR, and FIB-4 had simple demonstrative exactness of LEVs in liver cirrhosis. Simple blood indices can recognize the subdivision of patients who need endoscopy for the preventive administration of oesophageal varices. In any case, simple blood indices probably will not have the option to change the efficacy of UGIE for the finding of EVs in liver cirrhosis. Even though this scoring framework can be thought of in quality limitations, Enormous case-control research can be led for additional exploration analysis.

Conflict of Interest

The authors declared that there is no conflict of interest.

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