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Combined Albumin-Bilirubin Grade and Platelets (ALBI-PLT) Score and Albumin-Bilirubin Score (ALBI) as Simple Noninvasive Laboratory Markers for Prediction of Esophageal Varices in Cirrhotic Patients

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ABSTRACT
Background: Esophageal varices (OVs) are common side effects of liver cirrhosis that can be life-threatening. Esophago-gastroduodenoscopy (EGD) is the gold standard for detecting OVs. In spite of this, it is intrusive and expensive.
Objective: The aim of the current work was to evaluate albumin-Bilirubin Score (ALBI), AST/ALT ratio, aspartate to platelet count ratio index (APRI), Child-Pugh Score, albumin-bilirubin grade, platelets (ALBI-PLT score) and platelet count/spleen diameter ratio as noninvasive laboratory markers for prediction of OVs in cirrhotic patients.
Patients and Methods: Two hundred and sixty patients with liver cirrhosis were screened for OVs.
CBC, liver and kidney profiles and abdominal ultrasonography were done, ALBI, ALBI-PLT score, AST/ALT ratio, APRI, a Child-Pugh Score and platelet count/spleen diameter ratio were measured for all patients. Also, EGDs were performed by one professional endoscopist for all patients.
Results: ALBI, ALBI-PLT, Platelet count/spleen diameter ratio and Child-Pugh Score were reliable indicators of esophageal varices. The best one was ALBI-PLT where at cut-off >2, may predict OVs with sensitivity 96.48 and specificity 87.76 (P< 0.001). Using ALBI at a cutoff >-2.6. may predict OVs with sensitivity of 83.77% and specificity of 53.26% (P = 0.001). Also, these noninvasive markers could help in detecting OV's size (P <0.001).
Conclusion: It could be concluded that the combined albumin-bilirubin and platelet grade (ALBI-PLT) and the albumin-bilirubin ratio (ALBI), Platelet count/spleen diameter ratio and Child-Pugh Score could be used as noninvasive markers for detecting esophageal varices and grading them.
Keywords: Albumin-bilirubin ratio, Combined albumin-bilirubin grade and platelets, Varices, Cirrhosis.

INTRODUCTION

It is important to know that patients with cirrhosis are at risk for life-threatening bleeding and worsening of their illness if they have developed esophageal varices (EVs) [1]. Decompensated and compensated cirrhosis both have 60% and 40% of the population with this condition [2].

Every year, the prevalence of esophageal varices (EVs) rises by 5%, and the progression rate from minor to large varices is between 5% and 10% [3].

As a result, the first five editions of the Baveno consensus on portal hypertension had advocated frequent upper endoscopies for these patients in order to detect those at high risk of bleeding should begin a main prevention plan as soon as possible [4].

If you've ever had an extended period of "compensated" disease, you've likely been diagnosed with liver cirrhosis thanks to new non-invasive technologies for measuring the severity of liver damage [5].

At screening endoscopy, less than half of cirrhotic patients have varices, and the majority of them had small varices with a low risk of bleeding [6].

Due to the fact that many cirrhotic patients don't show up with high-risk varices, conducting endoscopy is a non-ideal screening technique that costs a lot of money and is unpleasant for the patient [7].

The Sixth Baveno Consensus on Portal Hypertension originally recommended the use of non-invasive procedures to rule out the presence of bleeding varices (Baveno VI). For "compensated advanced chronic liver disease" (cACLD), which is the same as the Baveno VI, patients who have normal platelets do not require monitoring endoscopy (>150x109/L) liver stiffness assessment as well (LSM)[4].

In a resource-limited environment, a non-invasive and more accessible technique is needed to anticipate the existence and hence the severity of OV. This noninvasive, already-available, low-cost method of predicting OV will be valuable in medical settings to help prioritize, stratify, and schedule early referrals for patients who are more likely to develop the condition for centers with upper endoscopy equipment and expertise [8].

Noninvasive predictors of EVs are of particular interest in impoverished countries like Egypt, where screening endoscopies are challenging due to the large number of patients with liver cirrhosis [9].

Using the albumin-bilirubin (ALBI) score, the severity of liver malfunction in patients with hepatocellular carcinoma can be assessed more easily and objectively [10].

It was discovered that the ALBI score was more accurate than the Child-Pugh (CP) and MELD ratings for noninvasively predicting the presence of esophageal varices and for grading them [11].

Potentially simple, objective, accurate, and practically relevant noninvasive methods for screening

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for high-risk varices (HRV) may be provided by the ALBI-PLT score [12].

These non-invasive indicators (such as ALBI, combined ALBI/PLT platelet PC/SD ratio, AST/ALT ratio, APRI and Child-Pugh Score) were used in this work to predict EVs and differentiate between grades in patients with cirrhosis.

PATIENTS AND METHODS

This study included a total of 260 cirrhotic patients, attending at Departments of Hepatology, Gastroenterology, and Infectious Diseases and Internal Medicine, Benha University Hospitals. This study was conducted between May 2021 to September 2021.

Patients under the age of eighteen, preceding variceal hemorrhage, thrombosis of the portal or splenic veins, prior use of non-selective b-blockers, splenectomy, TIPS, or transplantation of a liver, were excluded.

Patients were tested for esophageal varices and according to the presence and severity of varices, they were divided into three groups: **Group 1 (no varices)** consisted of 60 patients, **Group 2 (patients with minor OVs)** consisted of 50 patients, and **Group 3 (patients with large OVs)** consisted of 150 patients.

All patients were subjected to full history taking, clinical examination and laboratory and pathological evaluation including age, gender, alcohol consumption, abdominal ultrasonography and Modified Child score to confirm the diagnosis and severity of liver cirrhosis.

Laboratory investigations included CBC, AST, GGT, GGT, total bilirubin, direct bilirubin, albumin, creatinine, and glucose. Determination of HCV-Ab and HBs-Ag were performed to evaluate viral infection status.

- Based on log10 bilirubin level (0.66) + albumin level (0.085), the ALBI grade was determined. There are three ALBI grades: grade 1 (2.60), grade 2 (2.59 to 1.39), and grade 3 (>1.39), according to the ALBI's grading system [13].
- The platelet count (1 point if platelet count is greater than or equal to 150,000/mm3 and 2 points for platelet counts below 150,000/mm3) were used to compute the ALBI-PLT score [12].
- Hepatic encephalopathy status, ascites assessment and INR/bilirubin levels were used to calculate Child-Pugh (CP) scores. CP Score: Class A a score of 5-6, Class B a score of 7-9, and Class C a score of 10-15[14].
- Platelet count divided by AST (U/L) yields the APRI, which is equal to AST/ULN (100/109/L) [15].
- Aspartate aminotransferase-to-alanine aminotransferase ratio measurement and analysis
- By a professional endoscopist, for the detection of esophageal and gastric varices, as well as their locations and grades, the Olympus Q180 and Q240-Japan cameras were employed. During the operation, endoscopy determined whether or not there were any esophageal varices since they were either absent, little (less than 5mm in diameter), or large (>5mm) according to **Reiberger *et al.*** [16]. According to Austrian consensus guidelines on the care and treatment of portal hypertension, the presence of red spots should be considered a risk factor.

Ethical consent:

An approval of the study was obtained from Benha University Academic and Ethical Committee (giving it clearance number Ms.1.6.2021). Every patient signed an informed written consent for acceptance of participation in the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical Analysis

The data entered into the computer was examined using IBM SPSS software version 20.0. International Business Machines Corp. Qualitative data was described in terms of percentages and numbers. The Kolmogorov-Smirnov test was used to see if the distribution was normal. Mean (standard deviation), median (interquartile range), and interquartile range were employed to represent quantitative data ranges (minimum and maximum) (IQR).

A 5-percent criterion was employed to assess the relevance of the obtained results. A Chi-square test was used. Chi-square correction was necessary in more than 20% of cells when the expected count was less than 5. This test is used by students to determine the amount of data that falls within the normal distribution and to compare two groups of students. Ratio of Odds (OR): to figure out what the odds are. P value < 0.05 was considered significant.

RESULTS

There were 260 cirrhotic patients in this study, with a mean age of (57.40± 17.40) years. Men were 106 (40.77 %) while women were 154 (59.523 %). Causes of cirrhosis: pure HCV was present in 166 patients (63.84%), pure HBV in 26 patients (10.0%), combined HCV and bilharziasis in 45 patients (17.31%) with, AIH in 8 patients (3.07%) and others in 15 patients (5.77%). The presence of esophageal varices and its grading were, 60 patients (23.08%) had no esophageal varices, 50 patients (19.23%) had esophageal varices grade I-II (Small OVs) and 150 patients (57.7%) had esophageal varices grade III-IV (Large OVs). Patient's Clinical features, laboratory

parameters and ultrasound findings of the 3 groups were illustrated in (Table 1).

Table (1): The demographics of the groups studied.

		No varices (n = 60)	Small O. varices (n = 50)	Large O. varices (n = 150)	P value
Age (year) (Mean ± SD)		56.37±8.31	57.67±45.97	55.81±7.40	0.184
Gender Men Women		24 (40%) 36 (60%)	23 (46%) 27 (54%)	59(39.33%) 91 (60.67%)	0.238
Medical condition DM HTN		12 (20%) 15 (25%)	16 (32%) 7 (14%)	39 (26%) 20 (13. 33%)	0.082 0.792
Etiology of cirrhosis	HCV HBV BHF AIH Others	39 (65%) 6 (10%) 12 (20%) 0 (0.0%) 3 (5%)	28 (56%) 9 (18%) 9 (18%) 1 (1.67%) 3 (6%)	99 (66%) 11 (7.33%) 24 (16%) 7 (4.67%) 9 (6%)	0.743 0.512 0.874 0.358 0.675
Child-Pugh Score	A B C	48 (80%) 8 (13.33%) 4 (6.67%)	39 (78%) 9 (18%) 2 (4%)	49 (32.67%) 62 (41.33%) 39 (26%)	<0.001

Table (2): Laboratory data, ultrasound examination, and predictive scores were analyzed in studied patients.

Variable		No varices (n = 60)	Small O.varices (n = 50)	Large O.varices (n = 150)	P value		
Hb (g/dL)	Mean	8.97	9.46	10.62	<0.001*	P1	0.001
	± SD	1.79	1.78	2.42		P2	<0.001*
						P3	.523
Platelet (*10^3/mm^3)	Mean	158.91	126.15	67.80	<0.001*	P1	<0.001*
	± SD	32.31	4.57	7.40		P2	<0.001*
						P3	<0.001*
ALT (U/L)	Mean	34.38	27.83	28.96	0.466	-----	-----
	± SD	1.81	1.87	1.31		-----	-----
AST (U/L)	Mean	41.17	35.83	36.38	0.047*	P1	0.0766
	± SD	7.22	4.83	3.29		P2	0.075
						P3	0.040*
APRI	Mean	1.73	0.80	0.61	<0.001*	P1	0.123
	± SD	0.28	0.21	0.15		P2	<0.001*
						P3	<0.001*
Albumin (g/dL)	Mean	3.25	3.75	3.88	<0.001*	P1	0.075
	± SD	0.69	0.41	0.78		P2	<0.001*
						P3	<0.001*
Total bilirubin (mg/dL)	Mean	1.87	1.39	1.25	<0.001*	P1	0.374
	± SD	0.28	0.15	0.25		P2	<0.001*
						P3	<0.001*
Direct bilirubin (mg/dL)	Mean	0.55	0.3241	0.40	<0.001*	P1	0.974
	± SD	0.15	0.03	0.02		P2	<0.001*
						P3	<0.001*
ALBI	Mean	-1.47	-2.34	-2.78	<0.001*	P1	<0.001*
	± SD	0.48	0.34	0.36		P2	<0.001*
						P3	<0.001*
ALBI	ALBI 1	1 (0.67%)	16 (32%)	52 (86.7%)	<0.001*	P1 p2 p3	<0.002* <0.001* <0.001*
	ALBI 2	72 (48%)	28 (56%)	4 (6.6%)	<0.001*	P1 p2 p3	<0.003* <0.001* <0.001*
	ALBI 3	70(49.6%)	2 (4.5%)	1 (1.8%)	<0.001*	P1 p2 p3	<0.003* <0.001* <0.002*
ALBI - PLT	2	1 (0.7%)	4 (9.1%)	45 (81.8%)	<0.001*	P1 p2 p3	<0.002* <0.001* <0.001*
	3	1 (0.7%)	23 (52.3%)	6 (10.9%)		P1 p2 p3	<0.003* <0.001* <0.001*
	4	70 (49.6%)	15 (34.1%)	3 (5.5%)		P1 p2 p3	<0.003* <0.001* <0.002*
	5	69 (48.9%)	2 (4.5%)	1 (1.8%)		P1 p2 p3	<0.004* <0.001* <0.003*
INR	Mean	1.54	1.19	1.2	<0.001*	P1	0.929
	± SD	0.43	0.16	0.22		P2	<0.001*
						P3	<0.001*
Creatinine (mg/dL)	Mean	1.17	1.15	1.04	0.409	-----	------
	± SD	0.27	0.28	0.28		------	-------
PC/SD	Mean	452.63	824.96	1092.93	<0.001*	P1	<0.001*

	± SD	186.77	285.02	348.05		P2	<0.001*
						P3	<0.001*
Spleen size (cm)	Mean	17.32	15.70	14.60	<0.001*	P1	0.817
	± SD	2.06	2.00	2.47		P2	<0.001*
						P3	<0.001*
Child-Pugh Score	A	43 (30.5%)	38 (86.4%)	48 (87.3%)	<0.001*	P1 p2 p3	<0.003* <0.001* <0.002*
	B	61 (43.3%)	6 (13.6%)	5 (9.1%)		P1 p2 p3	<0.003* <0.001* <0.001*
	C	37 (26.2%)	0 (0.0%)	2 (3.6%)		P1 p2 p3	<0.002* <0.001* <0.001*

* Significant as P value < 0.05. P1: p value between patients who have no OVs and those who have small OVs, p2: p value between patients who have no OVs and those who have larg OVs, p3: p value between patients who have small OVs and those who have larg OVs.

There were significant differences among cirrhotic patients regarding presence of OVs as regard to hemoglobin, platelets, APRI, albumin, total bilirubin, ALBI, ALBI-Platelets, INR, Child-Pugh (CP) Score, platelet count/spleen diameter ratio, and spleen size (P <0.001).

Regarding detection of OV, ALBI, ALBI-PLT, Platelet count/spleen diameter ratio and Child-Pugh Score are reliable indicators of esophageal varices. The best one was ALBI-PLT at cut-off >2, which may predict esophageal varices with sensitivity 97.48, specificity 87.76, PPV 96.9, NPV 97.7, and AUC 0.982 (P 0.001), Esophageal varices can be predicted with a sensitivity of 83.77%, specificity of 53.26%, positive predictive value (87.3%), negative predictive value (45.6%) and an AUC of 0.711 (P = 0.001) using ALBI at a cutoff >-2.6. This study found that ALBI, ALBI-PLT, Child-Pugh Score, platelet count/spleen diameter ratio, spleen size, and APRI could be used to predict the size of OVs, allowing researchers to distinguish between small and big OVs, ALBI at a cut-off of >-2.03 has a sensitivity of 95.28, specificity of 93.75, PPV of 96.8, NPV of 90.9, and AUC of 0.971 (P value 0.001). Size may be predicted with 57.48 percent accuracy by ALBI-PLT when the cut-off value is set at or above three. This method's accuracy is also high, at 98.44 percent (P <0.001) are showed in (Tables 4, 5).

Table (3): Diagnostic performance of AST/ALT, APRI, ALBI, ALBI – PLT, PC/SD, Spleen size and Child-Pugh (CP) Scores-Pugh (CP) score in prediction of OV.

Cut-off	Sensitivity	Specificity	PPV	NPV	AUC	P value
ALBI >-2.6	83.77	53.06	87.4	45.6	0.711	**<0.001***
ALBI-PLT >2	97.48	87.76	96.9	97.7	0.982	**<0.001***
Child-Pugh (CP) Scores-Pugh (CP) Scores >6	57.59	97.96	99.1	37.2	0.843	**<0.001***
APRI >0.886	73.82	38.78	82.5	27.5	0.544	0.351
AST/ALT >1.23	58.64	53.06	83.0	24.8	0.523	0.641
PC/SD ratio ≤693.75	78.53	95.92	98.7	53.4	0.922	**<0.001***
Spleen size >15	72.77	30.61	80.3	22.4	0.560	**<0.001***

*significant as P value < 0.05

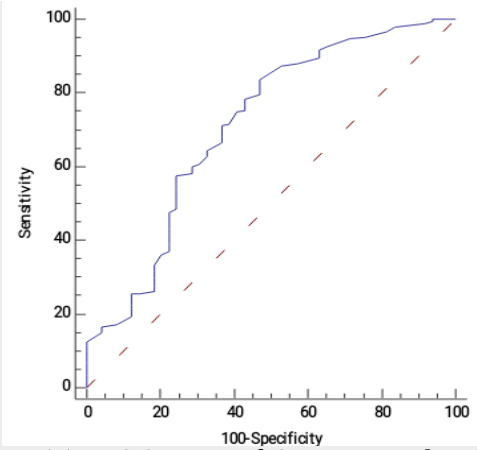

Figure (1): ROC curve of ALBI to predict OVs.

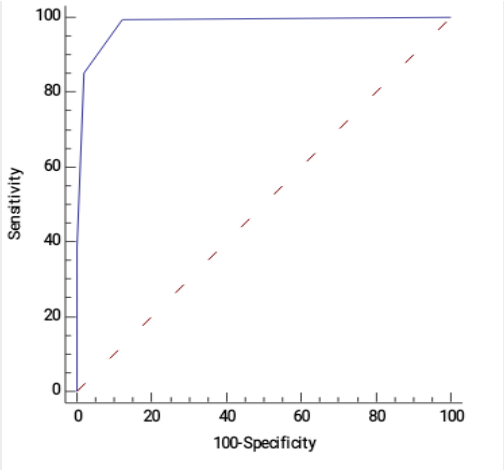

Figure (2): ROC curve of ALBI-platelets to predict OVs.

Esophageal varices were neither predicted nor graded by AST/ALT, according to this study (P value = 0.231) (Table 4).

Table (4): AST/ALT, APRI, ALBI, ALBI – PLT, PC/SD, Spleen size, and Child-Pugh assay performance (CP) According to scores, OV sizes can be predicted (differentiate between patients with Small OVs and patients large OVs).

Cut-off	Sensitivity	Specificity	PPV	NPV	AUC	P value
ALBI >-2.03	95.28	93.75	96.8	90.9	0.971	**<0.001***
ALBI-PLT>3	57.48	98.44	98.6	53.8	0.864	**<0.001***
Child-Pugh (CP) Scores >6	81.89	90.62	94.5	71.6	0.920	**<0.001***
APRI >0.98	76.38	59.38	78.9	55.9	0.731	**<0.001***
AST/ALT >1.083	35.43	89.06	86.5	41.0	0.610	0.231
PC/SD ratio ≤650	89.76	53.13	79.2	72.3	0.723	**<0.001***
Spleen size >16	67.72	56.25	75.4	46.8	0.622	**0.005***

*Significant as P value < 0.05

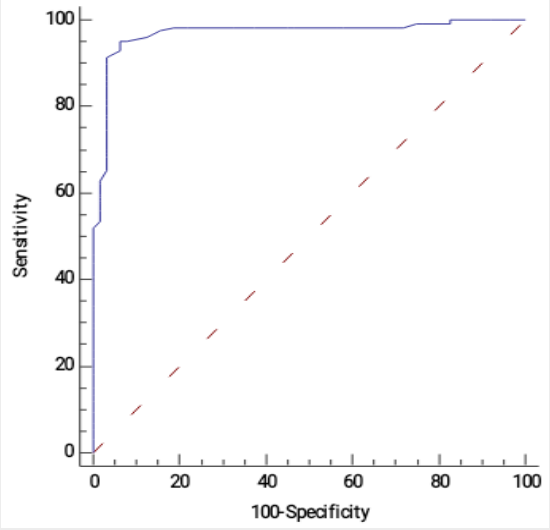

Figure (3): ALBI's ROC curve for predicting size.

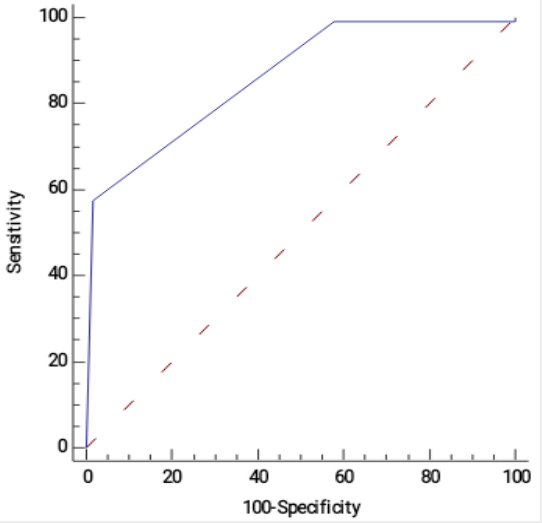

Figure (4): ROC curve of ALBI-PLT to predict the size.

In a logistic regression model for the prediction of esophageal varices, Child-Pugh (CP) scores, ALBI, ALBI, and the platelet count/spleen diameter ratio can all independently predict the existence of esophageal varices (Table 5).

Table (5): Logistic regression for prediction of esophageal varices

Variable	Coefficient	Std. Error	Wald	P
ALBI	-0.540	0.449	1.442	**<0.001***
ALBI_PLT	-0.022	0.328	0.005	**<0.001***
APRI	-0.242	0.374	0.420	0.517
AST/ALT	-0.232	0.803	0.084	0.773
Child-Pugh	1.833	0.541	11.5009	**<0.001***

(CP) Score				
PC/SD ratio	-0.006	0.001	28.8458	**<0.001***
US spleen	-0.024	0.121	0.03816	0.845

DISCUSSION

Varices can be detected and their size estimated by esophagogastroduodenoscopy (EGD). Endoscopy problems, including the requirement for intravenous sedation and the comparatively expensive cost, are among the drawbacks of EGD. In light of these limitations, novel methods of detecting esophageal varices have been developed [17].

Study participants (260) with liver cirrhosis were evaluated for a variety of clinical, laboratory, and ultrasonographic variables that could be used to identify or grade esophageal varices in this study.

A total of 200 patients (76.92 percent) had esophageal varices, with 50 (19.23 percent) having little varices (grade 1-2) and 150 (57.7 percent) having major varices (grade 3-4). This was close to **Duah *et al.*** [18] study results; in which it was observed that 90.60 percent of patients had esophageal varices, and that just 9.40 percent of patients (14 out of 135) were free of the condition. One hundred and eleven (82.22 percent) of the varices were large, while the remaining seventeen (17.78 percent) were minor.

In the current study, AST/ALT ratio was not a good marker for detection of esophageal varices (P value = 0.641), this was in concordant with **Savith and Bhumireddy** [19] who found that There was no evidence that esophageal varices were associated with an elevated AST/ALT ratio.(P=0.874).

On the other hand **Abdo *et al.*** [20] Cirrhotic patients with a cutoff of 0.9 AST/ALT ratio were found to be statistically significant in predicting the existence of overt OV, with 77.5 percent sensitivity, 75.9 percent specificity, an 86.1 percent positive predictive value (PPV), and an NPV of 62.5 percent.

Savith and Bhumireddy [19] found that APRI score was not statistically significant in predicting the presence of esophageal varices (P value = 0.351), which is consistent with the current study.

While **Stefanescu *et al.*** [21] employed APRI score to diagnose esophageal varices, they discovered that at a cutoff value (more than 1.4), sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were all greater than 60% at this cutoff value (more than 1.4).

These patients exhibited considerably higher mean APRI scores than cirrhotic patients with small varices. (P value <0.001), this came in concordant with the study performed by **Castera *et al.*** [22] who identified a correlation between the APRI score and the size of a patient's esophageal varices.

An accurate predictor of esophageal varices was discovered to be the PC/SD ratio (platelet count/splenic diameter). Using a threshold value of 693.75 to detect OV, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) all exceeded 80 percent. *AUC = 0.922, P = 0.001 *, OV detection was reported in a study by **Abdo *et al.*** [20]**.** with a sensitivity of 75%, a specificity of 85%, a positive predictive value of 90%, a negative predictive value of 63%, at a cutoff of level 643 of PC/SD ratio.

Also for detection of large varices, the best cutoff value of platelet count splenic diameter ratio (PC/SD) was ≤ 650 with sensitivity 89.76%, specificity 53.13%, PPV 79.2% and NPV 72.3% AUC 0.723 and P value <0.001. An earlier study found that at a cutoff of level = 909 of platelet count to splenic diameter ratio, had 88.5 percent sensitivity and 83.5 percent specificity for the diagnosis of major varices, which was quite similar to the findings in this work [23].

For cirrhotic patients with varices, the mean Child-Pugh scores were significantly higher than those of patients without varices in this study, with an overall Child-Pugh score that was 97% specificity and 99.1% positive predictive, for the detection of OV at a cutoff value greater than 6. There was a P value of less than 0.001 and an AUC of 0.843. The mean Child-Pugh score was considerably higher in cirrhotic patients with grade III and IV varices (large varices) than in cirrhotic patients with grade I and II varices (small varices). For huge varices, the best cutoff value was more than 6, with 81.89 percent specificity, 90.62 percent PPV and 71.62 percent NPV for the detection. The P value is less than 0.001 if the AUC is 0.920. [24].

But there are several drawbacks to the CP score; for example, because of the arbitrary use of cut-off values for continuous variables, the impact of a serum bilirubin level of 55 µmol/l is equal to a level of 550 µmol/l in CP score calculation [25].

Patients with esophageal varices had a considerably higher ALBI than those without esophageal varices (p <0.001), and patients with large esophageal varices had a significantly higher ALBI (p lower than 0.001) than patients with small esophageal varices (p lower than 0.001).

A ROC curve analysis of ALBI's ability to predict esophageal varices yielded a cut-off value of >-2.6, which had an AUC of 0.711 and p < 0.001. Patients with OV were found to have an AUC of 0.971% and P-value of 0.01 for ALBI's ability to detect size of OVs. According to findings by **Gom *et al.*** [11] in which they found that when the ALBI score is greater than or equal to 2.2 it can be used as a noninvasive predictor of esophageal varices with a cutoff value of >-2.2 and a p-value less than or equal to 0.001, ALBI can be used to diagnose esophageal varices noninvasively. Because their study had a smaller number of patients than ours, it's probable that this discrepancy is due to this (80 patients).

According to the study by **Yoshimoto *et al.*** [26]**,** ALBI had 66% sensitivity, 76.9% specificity, 61% PPV, and 0.83 percent NPV for predicting the occurrence of esophageal varices in HIV/HCV

coinfected patients who received infected blood products.

There are no portal hypertension indications in the CP or ALBI, such as platelet count. The liver's synthetic dysfunction is not a marker of portal hypertension, but rather a symptom.

ALBI-PLT was found to be a useful marker in this study for predicting the development of esophageal varices and identifying large from small OVs.

In this work, ALBI-PLT was more accurate than the other factors in predicting esophageal varices, with a sensitivity of 97.48, specificity of 87.76, PPV of 96.9, NPV of 97.7, AUC of 0.982, and a P value of 0.001 for the diagnosis of OVs, allowing researchers to distinguish between small and big OVs, ALBI at a cut-off of >-2.03 has a sensitivity of 95.28, specificity of 93.75, PPV of 96.8, NPV of 90.9, and AUC of 0.971 (P value 0.001). Size may be predicted with 57.48 percent accuracy by ALBI-PLT when the cut-off value is set at or above three. This method's accuracy is also high, at 98.44 percent (P <0.001).

ALBI grade and platelet count were combined for the first time in **Chen *et al.*** [12] to predict the risk of high risk varices (HRV) in compensated HCC patients (ALBI-PLT score), following in the footsteps of the Baveno VI consensus's combination of transient elastography and platelet count, a high negative predictive value of HRV was achieved if patients had an ALBI-PLT score of 2, which was 97.1 percent in the study cohort and 98.1 percent in the validation cohort. **Chen *et al.*** [12] found that, in order to identify persons at a low risk of HRV, the ALBI-PLT score can be used to identify people through a non-invasive method that is objective, accurate, and therapeutically helpful.

While platelet counts are used to monitor portal hypertension in patients who have cirrhosis, the ALBI is used to monitor the hepatic synthetic function of the liver. It's unexpected that the combination of hepatic synthetic function and portal hypertension performs better than either one alone, given the prevalence of clinical links between the two [27].

ALBI-PLT has numerous clinical advantages in addition to its great diagnostic value. There are no standardization requirements for ALBI-PLT, which means that it can be simply calculated at the bedside or in an outpatient clinic.

CONCLUSION

Non-invasive markers for the presence of esophageal varices, such as the ALBI grade and platelet count (ALBI-PLT), the albumin-bilirubin ratio (ALBI), Child-Pugh scores, and the platelet count/spleen diameter (PC/SD) ratio, could be used to reduce unnecessary endoscopies and its grade and to select patients who need endoscopy to decrease interventional burden and endoscopy units' workloads, thus reducing adverse effects, waste and saving money.

Study Limits: The number of participants was small. Consequently, large-scale research is required. The use of additional markers is importantly required.

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