

Article

Is There a Role for the Neutrophil-to-Lymphocyte Ratio for Rebleeding and Mortality Risk Prediction in Acute Variceal Bleeding? A Comparative 5-Year Retrospective Study

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Abstract

(1) Background: Acute variceal bleeding (AVB) represents an important cause of upper gastrointestinal bleeding (UGIB). Several prognostic scores may be useful for assessing mortality and rebleeding risk, with the Glasgow-Blatchford score (GBS) and Rockall score being the most commonly used for non-variceal bleeding. Scores assessing liver failure (MELD and Child) do not reflect bleeding severity. The neutrophil-to-lymphocyte ratio (NLR) increases in UGIB and can predict survival and rebleeding. (2) Methods: We analyzed the predictive role of NLR, GBS, Rockall, AIMS65, Child, and MELD for mortality (48 h, 5-day, in-hospital, and 6-week) and rebleeding in AVB patients admitted to our hospital from 2017 to 2021. ROC analysis was performed, and a multivariate analysis with logistic regression was used to construct a simplified model. (3) Results: A total of 415 patients were admitted. NLR exhibited fair accuracy for 48-h mortality (AUC 0.718, 95% CI 0.597–0.839, $p < 0.0001$), with limited predictive value for medium-term mortality. The NLR accuracy was better than that of the GBS and Rockall score, similar to that of the AIMS65 and Child scores, but inferior to that of MELD. The value for all scores in predicting rebleeding was poor, with the highest AUC for the NLR. (4) Conclusions: The NLR exhibited reasonable accuracy in predicting short-term mortality in AVB. Our model (including NLR, age, creatinine, bilirubin, albumin, INR, platelet count, HCC, and etiology) demonstrated 80.72% accuracy in predicting 6-week mortality.

Keywords: acute variceal bleeding; upper gastrointestinal bleeding; prognostic scores; Child-Turcotte-Pugh score; MELD; neutrophil-to-lymphocyte ratio



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1. Introduction

Acute variceal bleeding (AVB) represents a major complication of portal hypertension and a leading cause of upper gastrointestinal bleeding (UGIB). Mortality is estimated at approximately 15–20% [1,2] and is often correlated with the severity of the disease, most frequently assessed based on Child–Pugh and MELD scores [3]. Treatment of AVB includes band variceal ligation for esophageal variceal and type I gastroesophageal varices (GOV)

bleeding and obliteration with cyanoacrylate for type II GOV and isolated gastric varices, together with vasoactive treatment (preferably initiated before endoscopy) and prophylactic antibiotherapy [4–6]. A Sengstaken–Blakemore tube can be of temporary utility in cases of endoscopic failure. Salvage TIPS (Transjugular Intrahepatic Porto-systemic Shunt) or stent placement may be used in refractory AVB, and current guidelines recommend early TIPS in patients with Child scores B or C and active variceal bleeding at the time of endoscopy [3]. Despite these recommendations, access to TIPS varies across different countries.

Several prognostic scores have been proposed for predicting mortality, rebleeding, the need for intervention, and intensive care unit admissions [7]. The Glasgow–Blatchford score (GBS) and Rockall scores (clinical and full) are the most widely used scores for non-variceal bleeding; a more effective score for cirrhotic patients with bleeding is the AIMS65, proposed by Saltzmann in 2011, because it includes items such as albumin level, INR, and altered consciousness [8]. However, AVB prognosis is more often related to the severity of liver failure (reflected by the values of Child–Pugh–Turcotte or MELD score); the authors of the majority of studies have concluded that the accuracy of classical scores in variceal bleeding is inferior compared to that in non-variceal bleeding. A meta-analysis including 28 studies found that the Child–Turcotte–Pugh (CTP) score provides greater accuracy than classical prognostic scores (AIM65, GBS, and Rockall score) [9], with the MELD score noted as superior to the CTP score in some studies [10–13]. Most classical scores (excluding AIM65) do not include parameters associated with liver failure, which may alter the accuracy of AVB assessment. Some variants of the CTP and MELD scores (such as creatinine-CTP, MELD-3, MELD-Na, and UKELD) can be used for risk assessment [14]. A general prognostic score for assessing patients with UGIB is represented by the Charlson comorbidity index (CCI), which includes the presence of associated comorbidities and advanced age [15]. A major limitation of prognostic scores in AVB is the fact that classical prognostic scores reflect only bleeding severity (excluding albumin level in AIMS65), whereas liver failure scores (CTP and MELD) are not correlated with bleeding severity. Several studies assessing the accuracy of prognostic scores are summarized in Table S1.

The neutrophil-to-lymphocyte ratio (NLR) reflects an altered ratio between neutrophils (which stimulate inflammation via several cytokines) and lymphocytes (which correlate with immunoregulatory mechanisms) [16–18]. The authors of several published studies and meta-analyses have evaluated the importance of NLR in the outcome prediction of patients with acute pancreatitis, severe burns, ischemic and hemorrhagic stroke, myocardial infarction, venous thromboembolism, sepsis, COVID-19 pneumonia, and cancer [16,19–31], in addition to the risk of metabolic syndrome and MAFLD [32,33], cardiac surgery complications [34], encephalopathy [35], TIPS and virus C-cirrhosis complications [36,37]. Most studies regarding NLR and bleeding focus on intracerebral hemorrhage; in the acute phase, an increase in total leucocyte, monocyte, and granulocyte counts is recorded, combined with a reduction in lymphocyte count, and negative regulatory T cell levels decrease in the early phase of intracerebral bleeding, suggesting impaired control of inflammation by the immune system. High NLR levels are associated with gastrointestinal bleeding risk in patients with basal ganglia hemorrhage [22]. In patients with an unfavorable prognosis, CD3+ and CD3+CD4+ T lymphocyte counts are lower at an early stage following intracerebral hemorrhage [23]. Gastrointestinal bleeding can cause an inflammatory response, and peripheral blood inflammation may be associated with disease outcome [18]. Persistent lymphopenia appears more frequently in acute-onset diseases and may be induced by progressive inflammation; in comparison, increased neutrophil counts may be noted in acute bleeding and SIRS [16,17]. NLR levels can be increased through the use of corticosteroids (which increase neutrophil levels and may decrease lymphocyte counts); in comparison, dehydration can decrease both neutrophil function and lymphocyte counts. Thus far, only a

few research groups have assessed the predictive role of NLR in mortality and rebleeding in acute gastrointestinal bleeding [17,18,24,38,39], with higher NLRs associated with mortality risk [17,18] and rebleeding risk [24].

The objective of our study was to evaluate the prognostic role of NLR as compared to classical scores (GBS and modified GBS, CRS, FRS, AIMS65, Charlson comorbidity index, or CI), liver failure scores (CTP, CTP-creatinine, MELD, MELD-3, and UKELD), and several new scores (ALBi and PALBi) for assessing mortality and early rebleeding risk.

2. Materials and Methods

We performed a retrospective study including all patients with acute variceal bleeding and cirrhosis admitted to the Emergency Clinical Hospital Craiova between 1 January 2017, and 31 December 2021. We collected data from the hospital's Hippocrate computerized system, and the analysis of medical records was subsequently performed to exclude patients with non-variceal or lower gastrointestinal bleeding. We searched all patients aged over 16 years admitted for hematemesis, melena, gastrointestinal bleeding, or esophageal varices with bleeding (ICD-10 codes K92.0, K92.1, K92.2, and I85.0) with concomitant liver cirrhosis or chronic liver failure (ICD-10 codes K70, K72, K74). The results of laboratory analyses completed upon admission were collected. Inclusion criteria comprised acute variceal bleeding confirmed by endoscopy in patients with cirrhosis, confirmed by typical clinical and laboratory data and ultrasound results. Patients aged younger than 16 years, with non-cirrhotic variceal bleeding, with BCLC stage D hepatocellular carcinoma or stage IV carcinomas in other locations (due to high non-bleeding related mortality), and those with missing data were excluded. All patients signed an informed consent form for the use of their personal data. The protocol was approved by the Local Ethics Committee (approval number 11977; 24 March 2020).

The standard therapy for AVB included Terlipressin treatment for 3–5 days, saline and glucose solutions, 80 mg/day proton pump inhibitors, prophylactic antibiotherapy, and correction of clotting disorders in selected cases; cases exhibiting hemodynamic instability were managed through the use of a Sengstaken-Blakemore tube before endoscopy. Blood transfusions were recommended with a target hemoglobin value of 8 g/dl. Endoscopy was performed during the first 24 h of admission; variceal band ligation was used for esophageal varices or GOV1 (gastroesophageal varices). Cases with immediate failure were treated with Sengstaken-Blakemore tube placement, with endoscopy repeated during the first 24 h. For large varices or those with red signs, no active bleeding, and no white nipple, variceal band ligation was also performed if no other lesions were found upon endoscopy. Following endoscopy, all patients were closely monitored for continued or early recurrent bleeding (new onset of hematemesis, hematochezia, or melena accompanied by hemodynamic instability or hemoglobin decline of more than 3 g/dl) [5,6]; a new endoscopic hemostatic procedure is indicated in cases of recurrent bleeding. In cases with persistent bleeding, the Sengstaken-Blakemore tube was used.

The main outcomes in patients with acute variceal bleeding were early mortality, 6-week mortality, and early rebleeding. Because some patients with variceal bleeding can develop extensive bleeding accompanied by early death, 48 h, 5-day, and in-hospital mortality were assessed in our study, combined with 6-week mortality and early rebleeding; classical prognostic scores (CRS, FRS, GBS, modified GBS, and AIMS65), CTP and MELD scores, new scores (ALBi and PALBi) and the NLR value were analyzed to assess their predictive value (Tables S2–S7) [10,13,40,41]. For MELD, we used the formula $MELD = 9.57 * \ln(\text{Serum Cr}) + 3.78 * \ln(\text{Serum Bilirubin}) + 11.20 * \ln(\text{INR}) + 6.43$, rounded to the nearest integer [10,13,14,40,41].

Statistical analyses were performed using Microsoft Excel (Microsoft Corp., Redmond, WA, USA), with XLSTAT 2016 add-on for MS Excel (Addinsoft SARL, Paris, France) and IBM SPSS Statistics 20.0 (IBM Corporation, Armonk, NY, USA). Descriptive data were generated for the patients' characteristics, including percentages for categorical variables and means with standard deviations for continuous variables. For continuous variables, the Mann–Whitney test was used to assess the differences between groups, while differences regarding proportions between groups were evaluated using the Chi-square test. We performed univariate and multivariate logistic analyses for factors associated with mortality, including, in the multivariate model, factors identified through univariate logistic regression analysis with $p < 0.2$.

3. Results

A total of 415 patients with AVB were included in the analysis; the median age was 58.2 ± 10.9 years, and nearly 2/3 were male. Esophageal varices caused 92.1% of AVB cases; thirty-two cases of bleeding gastric varices and one case of bleeding jejunal varices were noted. Most patients were classed as Child B (54.7%) and C (26.1%). Alcoholic etiology was the most frequent cause (77.8%). The most frequent complication was hepatic encephalopathy (20.7%); hepatocellular carcinoma and portal vein thrombosis were noted in 5.1% and 3.9% of patients, respectively. In-hospital mortality for all patients was noted as 15.7%, and 6-week mortality was noted as 23.1%; for Child C class patients, in-hospital and 6-week mortality were noted as 27.2% and 41.7%. The early rebleeding rate in our cohort was 8.1% (Table 1).

The accuracy of prognostic scores was evaluated by constructing the area under the curve (AUC) and 95% confidence interval (95% CI) for mortality prediction (Tables 2 and 3, Figure 1A–H).

For 48 h mortality prediction, the most accurate scores were MELD-3 (AUC 0.808, 95% CI 0.694–0.922), MELD (AUC 0.807, 95% CI 0.697–0.916), MELD-Na (AUC 0.793, 0.676–0.910), and ALBi (AUC 0.792, 95% CI 0.680–0.903), followed by NLR (AUC 0.718, 95% CI 0.597–0.839), CTP-creatinine (AUC 0.693, 95% CI 0.558–0.828), PALBi (AUC 0.692, 95% CI 0.569–0.815), CTP (AUC 0.689, 95% CI 0.554–0.824), AIMS65 (AUC 0.673, 95% CI 0.546–0.800), and UKELD (AUC 0.671, 95% CI 0.541–0.801); all other classical prognostic scores, excluding AIMS65, exhibited low accuracy (AUC below 0.61 for GBS, mGBS, CRS, and FRS). For 5-day mortality, a similar classification of predictive value but with lower accuracy was noted; the most accurate scores were MELD (AUC 0.769, 95% CI 0.680–0.859), MELD-3 (AUC 0.762, 95% CI 0.667–0.857), ALBi (AUC 0.752, 95% CI 0.661–0.843), and MELD-Na (AUC 0.749, 95% CI 0.653–0.845), followed by CTP-creatinine (AUC 0.701, 95% CI 0.600–0.803), CTP (AUC 0.701, 95% CI 0.59–0.799), NLR (AUC 0.672, 95% CI 0.574–0.770), UKELD (AUC 0.671, 95% CI 0.569–0.773), AIMS65 (AUC 0.654, 95% CI 0.555–0.752), and PALBi (AUC 0.650, 95% CI 0.553–0.747). The same trend was noted for in-hospital and 6-week mortality; for in-hospital mortality, the most accurate scores were ALBi, MELD-Na, MELD-3, MELD, AIMS65, CTP-creatinine, CTP, NLR, and PALBi; in comparison, for 6-week mortality, the most accurate scores were ALBi (AUC 0.708, 95% CI 0.646–0.769) and MELD-Na (AUC 0.700, 95% CI 0.637–0.764), followed by MELD-3 (AUC 0.692, 95% CI 0.628–0.757), CTP-creatinine (AUC 0.682, 95% CI 0.617–0.747), UKELD (AUC 0.672, 95% CI 0.607–0.737), MELD (AUC 0.666, 95% CI 0.602–0.730), CTP (AUC 0.652, 95% CI 0.585–0.718), AIMS65 (AUC 0.643, 95% CI 0.578–0.708), and NLR (AUC 0.619, 95% CI 0.554–0.684); classical scores exhibited a lower accuracy (AUC below 0.61), although statistical significance was attained for the modified GBS, GBS, and FRS.

Table 1. Characteristics of patients with acute variceal bleeding (N = 415).

Age (years); mean $\pm$ standard deviation (range)	58.2 $\pm$ 10.9 (28–85)
Age (n, %) < 60	204 (49.2)
60–79	204 (49.2)
>80	7 (1.7)
Gender Males/Females (% Males)	273/142 (65.8%)
Etiology (%)	
Esophageal varices	382 (92.1)
Gastric varices	32 (7.7)
Jejunal varices	1 (0.2)
Blood transfusion pts/%/mean	235/56.6/3.1 $\pm$ 1.9
Laboratory analyses median (IQR)	
Hemoglobin	8.13 (6.625–10)
Neutrophil count	6200 (3850.5–9660.5)
Lymphocyte count	1300 (800–1900)
Platelet count	94,730 (67,140–134,450)
Urea	54 (36–77)
Creatinine	0.72 (0.63–0.885)
INR	1.55 (1.34–1.88)
Albumin	2.7 (2.3–3.1)
Total bilirubin	2.11 (1.215–3.445)
ALT	35 (25–62.5)
Na	136 (132–139)
Systolic blood pressure median (IQR)	120 (100–130.5)
Child class %	
A	3.9
B	51.7
C	44.4
Etiology %	
Alcohol	323 (77.8)
Hepatitis B $\pm$ D	26 (6.2)
Hepatitis C	64 (15.4)
Biliary	2 (0.5)
Complications, comorbidities No. (%)	
Encephalopathy	86 (20.7)
Hepatocellular carcinoma	21 (5.1)
Portal vein thrombosis	16 (3.9)
Pulmonary	2 (0.5)
Cardiovascular	10 (2.4)
Diabetes	71 (17.1)
Kidney	9 (1.9)
Other neoplasia	8 (1.9)
Early rebleeding rate (%)	32 (8.1)
Mortality (%)	
48 h	25 (6)
5-day	41 (9.9)
In-hospital	65 (15.7)
6-week	96 (23.1)
Child A/B/C % (in-hospital)	0/9/22.2
Child A/B/C % (6-week)	0/19.1/33.9

For NLR, the cutoff values, sensitivity, specificity, and accuracy were 5.875, 82.6%, 62.7%, and 63.8% for 48 h mortality, 4.574, 77%, 49.6%, and 53.6% for in-hospital mortality, and 4, 80.6%, 45.3%, and 54.1% for 6-week mortality. All scores demonstrated poor predictive value for early rebleeding, with none having an AUC above 0.6 (Table 4, Figure 2A,B).

Table 2. Main prognostic scores for 48 h and 5-day mortality.

	48 h Mortality						5-Day Mortality					
	AUC	95% CI	<i>p</i> -Value	Sn	Sp	Cutoff	AUC	95% CI	<i>p</i> -Value	Sn	Sp	Cutoff
NLR	0.718	0.597–0.839	<0.0001	82.6	62.7	5.875	0.672	0.574–0.770	0.001	71.1	63.4	5.875
GBS	0.511	0.388–0.633	0.865	47.8	51	10	0.488	0.393–0.583	0.574	43.6	50.5	10
mGBS	0.523	0.400–0.646	0.713	52.2	51.8	7	0.504	0.408–0.599	0.939	61.5	40.1	6
CRS	0.537	0.418–0.656	0.539	40	70	4	0.529	0.434–0.623	0.552	36.6	70.1	4
FRS	0.609	0.488–0.729	0.077	64	53.2	6	0.580	0.484–0.676	0.101	80.5	31.6	5
AIMS65	0.673	0.546–0.800	0.008	90.9	45	1	0.654	0.555–0.752	0.002	81.6	45.6	1
CCI	0.492	0.375–0.608	0.888	52	43.1	4	0.461	0.370–0.552	0.404	48.8	42.5	4
CTP	0.689	0.554–0.824	0.006	73.7	56.9	8	0.697	0.595–0.799	<0.0001	76.5	58.5	9
CTP-creatinine	0.693	0.558–0.828	0.005	78.9	53.4	9	0.701	0.600–0.803	<0.0001	79.4	54.8	9
MELD	0.807	0.697–0.916	<0.0001	87	67.7	10	0.769	0.680–0.859	<0.0001	79.5	69.3	10
MELD-3	0.808	0.694–0.922	<0.0001	85.7	72.1	27	0.762	0.667–0.857	<0.0001	77.1	73.6	27
MELD-Na	0.793	0.676–0.910	<0.0001	85.7	65.8	28	0.749	0.653–0.845	<0.0001	77.1	71.9	29
UKELD	0.671	0.541–0.801	0.010	52.4	76	54	0.671	0.569–0.773	0.001	54.3	77.3	54
ALBi	0.792	0.680–0.903	<0.0001	69.6	82.2	−0.829	0.752	0.661–0.843	<0.0001	59	82	−0.843
PALBi	0.692	0.569–0.815	0.002	87	49.6	−2.678	0.650	0.553–0.747	0.003	82.1	50.7	−2.678

NLR = neutrophil-to-lymphocyte ratio; GBS = Glasgow-Blatchford score; mGBS = modified Glasgow-Blatchford score; CRS = clinical Rockall score; FRS = full Rockall score; CCI = Charlson comorbidity index; CTP = Child-Turcotte-Pugh score; CTP-creatinine = Child-Turcotte-Pugh-creatinine score; ALBi = albumin-bilirubin score; PALBi = platelet-albumin-bilirubin score; Sn = sensitivity; Sp = specificity. Statistically significant *p*-values are marked with italicized fonts.

Table 3. Main prognostic scores for in-hospital and 6-week mortality.

	In-Hospital Mortality						6-Week Mortality					
	AUC	95% CI	<i>p</i> -Value	Sn	Sp	Cutoff	AUC	95% CI	<i>p</i> -Value	Sn	Sp	Cutoff
NLR	0.631	0.551–0.711	0.001	77	49.6	4.574	0.619	0.554–0.684	<0.0001	80.6	45.3	4
GBS	0.562	0.482–0.641	0.129	30.6	84.4	12	0.589	0.524–0.654	0.007	60.6	55.1	10
mGBS	0.576	0.496–0.655	0.063	27.4	86.2	9	0.603	0.539–0.668	0.002	60.6	55.7	7
CRS	0.562	0.483–0.640	0.122	40.6	71.2	4	0.526	0.462–0.590	0.423	34.9	70.9	4
FRS	0.592	0.512–0.671	0.023	60.3	54.4	6	0.570	0.506–0.635	0.033	58.1	55.7	6
AIMS65	0.672	0.592–0.751	<0.0001	80	47.1	1	0.643	0.578–0.708	<0.0001	73	48.5	1
CCI	0.545	0.467–0.623	0.260	62.5	44.4	4	0.582	0.518–0.647	0.012	61.5	46.3	4
CTP	0.661	0.579–0.743	<0.0001	67.9	59.4	9	0.652	0.585–0.718	<0.0001	43.8	79.9	10
CTP-creatinine	0.668	0.586–0.751	<0.0001	69.6	55.5	9	0.682	0.617–0.747	<0.0001	41.7	87.6	11
MELD	0.701	0.623–0.778	<0.0001	67.2	70.3	10	0.666	0.602–0.730	<0.0001	47.5	85	12
MELD-3	0.706	0.627–0.786	<0.0001	61.4	76.7	28	0.692	0.628–0.757	<0.0001	49.5	84.1	30
MELD-Na	0.707	0.628–0.787	<0.0001	64.9	73	29	0.700	0.637–0.764	<0.0001	57.7	75.9	29
UKELD	0.665	0.583–0.747	<0.0001	49.1	83.6	55	0.672	0.607–0.737	<0.0001	41.2	85.5	55
ALBi	0.733	0.658–0.808	<0.0001	56.5	83.4	−0.850	0.708	0.646–0.769	<0.0001	49	83.8	−0.871
PALBi	0.623	0.544–0.703	0.002	69.4	54.7	−2.515	0.570	0.505–0.635	0.036	67.3	47.6	−2.781

NLR = neutrophil-to-lymphocyte ratio; GBS = Glasgow-Blatchford score; mGBS = modified Glasgow-Blatchford score; CRS = clinical Rockall score; FRS = full Rockall score; CCI = Charlson comorbidity index; CTP = Child-Turcotte-Pugh score; CTP-creatinine = Child-Turcotte-Pugh-creatinine score; ALBi = albumin-bilirubin score; PALBi = platelet-albumin-bilirubin score; Sn = sensitivity; Sp = specificity. Statistically significant *p*-values are marked with italicized fonts.

We performed univariate and multivariate analyses of clinical and laboratory parameters associated with 48 h and 6-week mortality (Tables 5 and 6), followed by logistic regression to obtain the most accurate model.

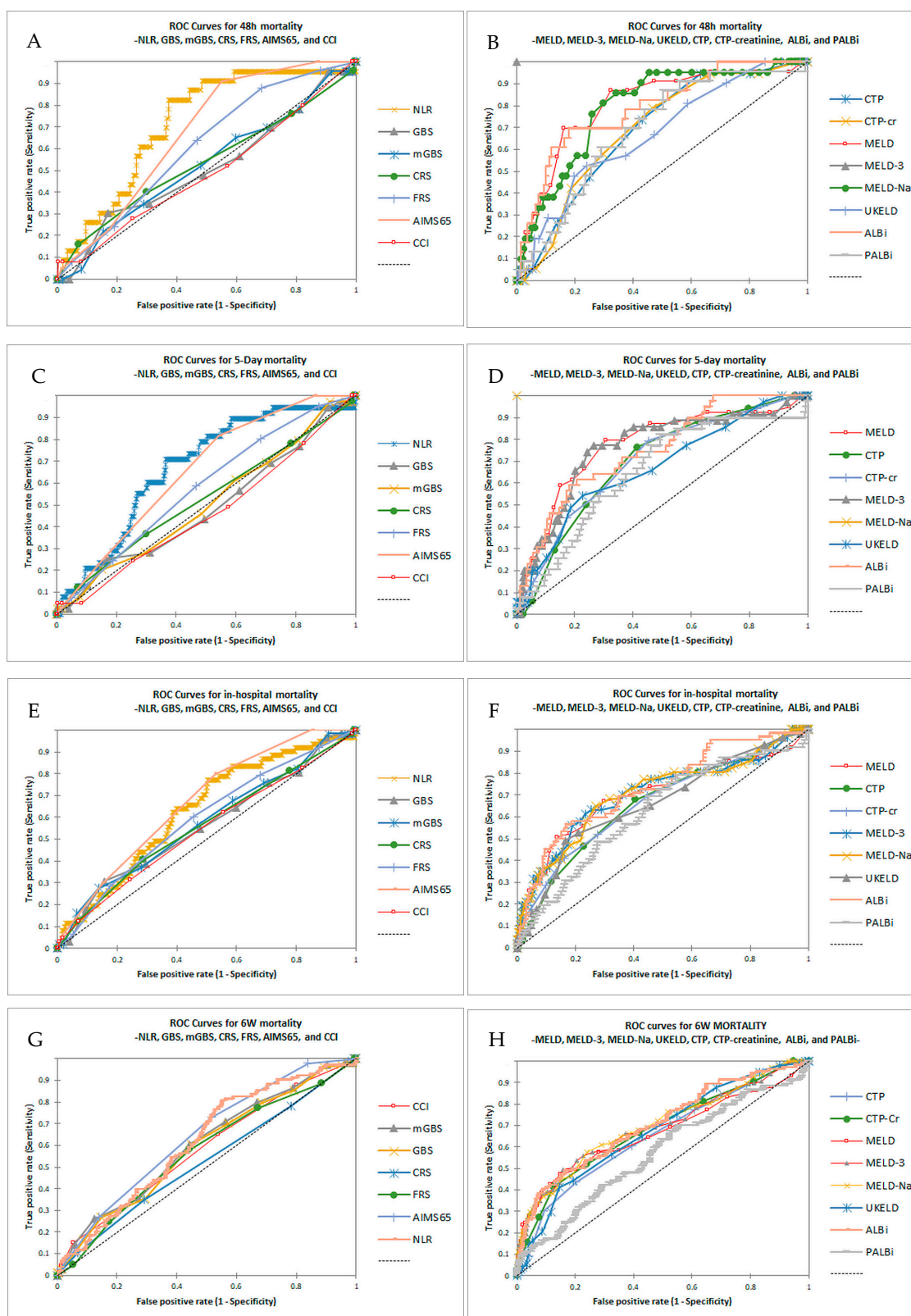
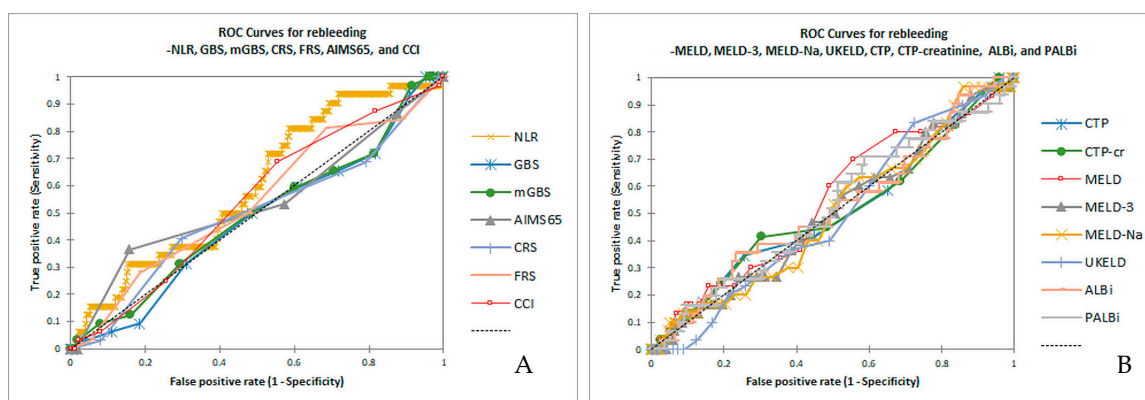


Figure 1. (A,B). ROC for 48 h mortality for NLR compared to GBS, mGBS, CRS, FRS, AIMS65, and CCI (A) and CTP, CTP-creatinine, MELD, MELD-3, MELD-Na, UKELD, ALBi, and PALBi (B). (C,D). ROC for 5-day mortality for NLR compared to GBS, mGBS, CRS, FRS, AIMS65, and CCI (C) and CTP, CTP-creatinine, MELD, MELD-3, MELD-Na, UKELD, ALBi, and PALBi (D). (E,F). ROC for in-hospital mortality for NLR compared to GBS, mGBS, CRS, FRS, AIMS65, and CCI (E) and CTP, CTP-creatinine, MELD, MELD-3, MELD-Na, UKELD, ALBi, and PALBi (F). (G,H). ROC for 6-week mortality for NLR compared to GBS, mGBS, CRS, FRS, AIMS65, and CCI (G) and CTP, CTP-creatinine, MELD, MELD-3, MELD-Na, UKELD, ALBi, and PALBi (H).

Table 4. Main prognostic scores for early rebleeding with sensitivity, specificity, and cutoff.

	AUC	95% CI	p-Value	Sn	Sp	Cutoff
NLR	0.600	0.492–0.707	0.069	81.3	41.3	4.050
GBS	0.475	0.372–0.578	0.635	50	51.2	10
mGBS	0.493	0.389–0.596	0.890	50	51.7	7
CRS	0.497	0.393–0.601	0.952	40.6	70.2	4
FRS	0.543	0.437–0.649	0.426	50	52.4	6
AIMS65	0.541	0.431–0.650	0.468	53.3	42.7	1
CCI	0.544	0.438–0.651	0.415	68.8	44.4	4
CTP	0.505	0.395–0.615	0.929	34.5	74.5	10
CTP-creatinine	0.505	0.396–0.615	0.925	41.4	69.7	10
MELD	0.541	0.432–0.651	0.461	70	44.2	7
MELD-3	0.502	0.394–0.610	0.969	50	49.3	21
MELD-Na	0.500	0.393–0.608	0.997	53.3	49.6	23
UKELD	0.494	0.386–0.601	0.910	60	41.1	50
ALBi	0.519	0.412–0.626	0.731	35.5	76.7	−0.870
PALBi	0.517	0.411–0.624	0.749	71	41.5	−2.860

NLR = neutrophil-to-lymphocyte ratio; GBS = Glasgow–Blatchford score; mGBS = modified Glasgow–Blatchford score; CRS = clinical Rockall score; FRS = full Rockall score; CCI = Charlson comorbidity index; CTP = Child–Turcotte–Pugh score; ALBi = albumin–Bilirubin score; PALBi = platelet–albumin–Bilirubin score; Sn = sensitivity, Sp = specificity.

**Figure 2.** (A,B). ROC for early rebleeding prediction for NLR compared to GBS, mGBS, CRS, FRS, AIMS65, and CCI (A) and CTP, CTP-creatinine, MELD, MELD-3, MELD-Na, UKELD, ALBi, and PALBi (B).**Table 5.** Categorical parameters (Chi-square test) for 48 h mortality.

Variable	Alive (%)	Dead (%)	<i>p</i> Chi2
Encephalopathy	16.9	33.3	0.0021
Hepatocellular carcinoma	4.08	8.3	0.0952
Portal vein thrombosis	4.4	2.1	0.3037
Gastric varices	7.8	10.4	0.4252
Forrest	40.1	39.6	0.9243
Endoscopy treatment	61.4	56.3	0.3621
CTP class (A/B/C)	20/55.8/18.8	11.5/39.6/44.8	0.0000
Cirrhosis etiology			0.0098
-Alcohol	72.1	67.7	
-Viral	27.1	32.9	

CTP = Child–Turcotte–Pugh. Statistically significant *p*-values are marked with italicized fonts.

Table 6. Numerical parameters and *p*-values (Mann–Whitney test) for 48 h mortality.

Variable	Mean (IQR)	Alive	Dead	<i>p</i> Mann–Whitney
AGE		59 (51–66)	62 (52–68)	0.0609
Hb		8.38 (6.63–10.12)	7.91 (6.63–9.43)	0.1582
NLR		4.50 (2.71–7.48)	6.05 (4.42–9.57)	<0.0001
Platelet count		93,400 (62,610–131,500)	103,700 (73,787.5–151,250)	0.0368
Urea		49.5 (34–71.75)	65 (45.75–95.25)	0.0001
Creatinine		0.7 (0.62–0.84)	0.82 (0.6775–1.2825)	<0.0001
INR		1.54 (1.334–1.81)	1.65 (1.38–2.21)	0.0111
Albumin		2.8 (2.4–3.2)	2.5 (2–2.8)	<0.0001
Total bilirubin		1.93 (1.2–3.215)	2.555 (1.2775–5.9775)	0.0071
Na		136 (132–139)	135 (131–137)	0.0374
ALT		35 (23.5–55)	40 (27.75–83.5)	0.0353
Systolic blood pressure		120 (105–135)	110 (100–130)	0.0011
CTP		9 (8–10)	10 (9–12)	<0.0001
CTP-creatinine		9 (8–10)	11 (9–13)	<0.0001
GBS		10 (8–12)	11 (8–12)	0.7925
CRS		4 (4–5)	4 (4–5)	0.5811
AIMS65		2 (1–2)	2 (1–2)	0.8954
FRS		6 (5–7)	6 (5–7)	0.9619
mGBS		7 (5–9)	8 (5–9)	0.6112
CCI		5 (4–5)	5 (4–6)	0.0003
MELD		15 (12–19)	15 (11–18)	0.1256
MELD-3		33 (27.25–40.75)	32 (25–38)	0.1851
MELD-Na		17 (13–21.98)	16 (11–20.864)	0.1240
UKELD		52 (50–56)	52 (49–55)	0.1599
ALBi		−1.30 (−1.66–−0.87)	−1.25 (−1.70–−0.85)	0.8732
PALBi		−2.50 (−3.29–−1.70)	−2.69 (−3.63–−1.90)	0.1672

NLR = neutrophil-to-lymphocyte ratio; GBS = Glasgow–Blatchford score; mGBS = modified Glasgow–Blatchford score; CRS = clinical Rockall score; FRS = full Rockall score; CCI = Charlson comorbidity index; CTP = Child–Turcotte–Pugh score; CTP-creatinine = Child–Turcotte–Pugh-creatinine score; ALBi = albumin-bilirubin score; PALBi = platelet-albumin-bilirubin score. Statistically significant *p*-values are marked with italicized fonts.

Next, we constructed new models for predicting 48-h and 6-week mortality based on the variables with $p < 0.2$ in univariate logistic regression models, including the NLR and categorical and numerical parameters, but excluding scores such as MELD, CTP, ALBi, or PALBi. A final model for mortality prediction was subsequently obtained for 6-week mortality, with sufficient accuracy and specificity and lower sensitivity, but fewer factors, and fairly good correctness; for 48-h mortality, the sensitivity was good; however, the specificity was poor (Tables 7–10).

Table 7. Logistic model for 48 h mortality.

Variable	DF	Chi-Square (Wald)	Prob > Wald	Chi-Square (LR)	Prob > LR
Age	1	0.1425	0.7058	0.1438	0.7045
NLR	1	1.8644	0.1721	1.8374	0.1752
Platelet	1	0.0035	0.9525	0.0035	0.9524
Creatinine	1	0.3298	0.5657	0.3888	0.5329
INR	1	9.5275	0.0020	10.4284	0.0012
Albumin	1	8.2249	0.0041	9.3848	0.0022
Total bilirubin	1	0.0019	0.9650	0.0019	0.9650
Etiology: alcohol vs. viral	1	0.0005	0.9805	12.5589	0.0004
Hepatocellular carcinoma	1	1.4128	0.2346	1.2260	0.2682

Table 8. The correctness of classification (48 h mortality).

From\To	Presumed Alive	Presumed Dead	Total	% Correct
Alive	365	2	367	99.46
Death	20	2	22	9.09
Total	385	4	389	94.34

Table 9. Logistic model for 6-week mortality.

Variable	DF	Chi-Square (Wald)	Prob > Wald	Chi-Square (LR)	Prob > LR
Age	1	8.8426	0.0029	9.4360	0.0021
NLR	1	3.7683	0.0522	3.7536	0.0527
Platelet	1	6.5552	0.0105	6.4653	0.0110
Creatinine	1	10.3801	0.0013	12.5999	0.0004
INR	1	4.2073	0.0402	4.3986	0.0360
Albumin	1	15.2731	<0.0001	16.6575	<0.0001
Total bilirubin	1	2.2143	0.1367	2.4047	0.1210
Etiology: alcohol vs. viral	1	3.1231	0.0772	3.30532	0.0691
Hepatocellular carcinoma	1	2.6027	0.1067	2.5729	0.1087

Table 10. The correctness of classification (6-week mortality).

From\To	Presumed Alive	Presumed Dead	Total	% Correct
Alive	273	17	290	94.14
Death	58	41	99	41.41
Total	331	58	389	80.72

4. Discussion

NLR is associated with the severity of inflammation and may identify cirrhotic patients at increased risk of mortality and readmissions for hepatic encephalopathy [35]. It has also been shown to have a positive correlation with CTP score and be of independent predictive value for survival [35,37]. Because NLR is correlated with the level of inflammation, it may increase in parallel with the severity of encephalopathy symptoms by increasing the neurotoxicity induced by ammonia through the blood–brain barrier [35]. Both higher neutrophil count and lower lymphocyte count were noted in decompensated cirrhotic

patients compared to those with compensated disease [35]. The NLR can increase in patients with gastrointestinal bleeding because of associated inflammation and high neutrophil counts [17,18]. NLR values may be influenced by age, the etiology of cirrhosis, and the presence of diabetes [37], thus complicating the search for an ideal cutoff [37]. In our study, the NLR demonstrated fairly good prognostic value for 48 h mortality; however, the simplified model primarily predicted 48 h survival. The NLR predictive value decreased from short-term to medium-term survival (AUC 0.718, 95% CI 0.597–0.839 for 48 h mortality, 0.672, 95% CI 0.574–0.770 for 5-day mortality, 0.631, 95% CI 0.551–0.711 for in-hospital mortality, and 0.619, 95% CI 0.554–0.684 for 6-week mortality). The accuracy of NLR was superior to that of classical prognostic factors (GBS, mGBS, CRS, and FRS) and similar to AIMS65, with the AUC for NLR slightly superior to AIMS65 for both 48 h and 5-day mortality but marginally inferior for in-hospital and 6-week mortality. In a study on patients with both non-variceal and AVB, the AUC for in-hospital mortality was 0.640 for NLR, 0.662 for GBS, 0.747 for FRS, 0.687 for NLR-GBS, and 0.763 for NLR-FRS [18].

In our study, the accuracy of classical prognostic scores (clinical and full Rockall scores, GBS, and modified GBS) was poor for all analyzed outcomes (in-hospital and 6-week mortality and early rebleeding), with no significant differences between scores; in all of these cases, the AUC was below 0.6. The accuracy of classical prognostic scores in predicting mortality and other clinical outcomes in AVB is considered inferior compared to non-variceal UGIB [10,14,40,42,43] because the mortality rate in AVB is more closely related to the severity of liver failure than the severity of bleeding [44]. In several studies comparing classical scores and those evaluating liver failure, the AUC for the Rockall score ranged from 0.533 and 0.834, with values below 0.7 in [40,42,43,45–47], values between 0.7 and 0.8 in [10,44,45,48,49], and values above 0.8 in [50,51]. In the literature, AUC values for the Glasgow–Blatchford score between 0.56 and 0.781 have been recorded. Values below 0.7 have been noted in some studies [40,42–45,47]; in comparison, the authors of other studies have reported AUC values between 0.7 and 0.8 [46,48,50,52,53], and no study authors have reported an AUC above 0.8. For the AIMS65, the prognostic value in our study was slightly better than GBS, mGBS, CRS, and FRS, with AUC values of 0.673, 0.672, and 0.643 for 48 h, in-hospital, and 6-week mortality. In the literature, values between 0.525 and 0.97 have been reported in several studies, with values below 0.7 in [14,40,42,43,45], values between 0.7 and 0.8 in [47,50], and values above 0.8 in [10,13,46,48,49,53–55]. In most studies, AIMS65 (which incorporates albumin level and an indicator of liver failure) appears to be superior to the Rockall score or GBS [10,43,45–49,53]; few studies have demonstrated the superiority of both RS and GBS, however [42,50].

In our study, MELD, MELD-3, and MELD-Na demonstrated superior accuracy compared with CTP and CTP-creatinine scores in predicting short- and medium-term mortality. Both MELD and CTP scores were superior to classical prognostic scores and AIMS65. In most studies, CTP and MELD appear to be superior to classical scores in assessing mortality risk [10,14,40,45,52,56]; similar levels of accuracy have been reported in other studies [50]. In comparison, in two other studies, AIMS65 was superior to CTP and MELD in predicting both in-hospital and 6-week mortality [46,54] but demonstrated no differences in terms of performance compared to MELD-Na [46]. In the literature, the values of AUC for CTP score have been estimated to be between 0.668 and 0.9, with values below 0.7 reported in one study [57], values between 0.7 and 0.8 reported in some studies [9,12,45,46,49,58–60], and values above 0.8 reported in others [14,40,43,48,50,52,54,56,61–66]. For MELD score and variants, the AUC was estimated between 0.688 and 0.88, with values below 0.7 in [14,43,57], between 0.7 and 0.8 in [9,40,45,46,58,59,62–68], or above 0.8 in [10–13,48,52,54–56,60,61]. Direct comparison between CTP and MELD has shown conflicting results; in some studies, CTP was superior [14,40,43,51,65] or exhibited similar results [9,45,46,48–50,52,54,56–59,61–65,69]; in

comparison, in other studies, CTP was proven inferior to MELD [10–13]. In a systematic review and meta-analysis, the AUC for predicting in-hospital mortality was 0.824 for CTP, 0.9793 for AIMS65, 0.788 for MELD, 0.75 for the full Rockall score, and 0.683 for GBS, with CTP having the highest sensitivity and AIMS having the highest specificity; for follow-up mortality, MELD appears to be superior to CTP, with an AUC of 0.798 for MELD, 0.77 for AIMS65, and 0.746 for CTP; in comparison, the values for full Rockall score and GBS were below 0.7 (because they did not include an assessment of liver failure) [1]. Some new proposed scores, such as ALBi (albumin–bilirubin), PALBi (platelet–albumin–bilirubin), or CAGIB (diabetes, hepatocellular carcinoma, albumin, bilirubin, and creatinine), have also been proposed in some studies [13,57,62–70]; in our study, ALBi, but not PALBi, demonstrated good prognostic value, close to the MELD variants.

The value of all scores in predicting early rebleeding was poor in our study, with the highest value for NLR. In one published study, NLR and PLR increased in AVB patients who suffered rebleeding; the AUC for rebleeding was 0.7037 for NLR and 0.7468 for PLR [39]. Although we did not find good predictive value for NLR in early rebleeding, the fact that NLR had the highest score for the prediction of early rebleeding seems encouraging and warrants further analysis in future studies.

In our study, the accuracy of all scores decreased for medium-term prognosis, with high AUC values of 0.700 and 0.708 for MELD-Na and ALBi only. Classical scores (Rockall and GB scores) do not include an assessment of the degree of liver failure; in comparison, CTP and MELD scores are focused only on the severity of liver failure and not the severity of bleeding. Our simplified model (NLR, age, creatinine, bilirubin, albumin, INR, platelet count, HCC presence, and etiology) can be of utility in predicting 6-week mortality, with excellent survival prediction accuracy (94.14%) but only weak mortality prediction accuracy (41.41%). In-hospital mortality prediction accuracy was poor, however, because only the survival prediction was accurate (99.46%), whereas the mortality prediction was highly inaccurate (9.09%). In the literature, some nomograms for MELD or CTP have been proposed to improve the accuracy of prognostic scores [71–80]; however, challenges may be encountered in clinical applications because of complicated formulas.

Several limitations of the current study should be noted. The small number of patients, combined with the monocentric and retrospective nature of the study, significantly limits the generalizability of our findings; larger or multicenter studies will be necessary for external validation and improved data accuracy. All scores had mild specificity, while sensitivity was high in most scores. No score was found to be highly accurate for the analyzed outcomes (excluding MELD in 48 h mortality analysis); the prediction of early rebleeding was particularly inaccurate. Early or salvage TIPS is not available at our center, which may have impacted both mortality and rebleeding. Subgroup analysis related to esophageal or gastric variceal bleeding was not possible because of the small number of gastric varices cases. Future studies analyzing the role of NLR and other simple hematological parameters for the prognosis of variceal and non-variceal bleeding, possibly in combination with other factors, may help to accurately predict both mortality and rebleeding and also more effectively manage patients with severe bleeding and hemodynamic instability.

5. Conclusions

In this study, the neutrophil-to-lymphocyte ratio played a fairly good prognostic role in predicting short-term mortality in patients with acute variceal bleeding, with decreasing accuracy for medium-term prognosis; its accuracy was similar to that of AIMS65 (for short- and medium-term mortality) and the CTP score (short- and medium-term mortality) but was inferior to that of MELD variants. Classical prognostic scores (Glasgow–Blatchford and Rockall) were of lower prognostic value than the NLR, AIMS65, and MELD variants.

MELD scores are the most accurate for mortality prediction. No score showed particular effectiveness in predicting early rebleeding, although the NLR was noted as having the highest AUC (0.600).

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/diseases13080265/s1>, Table S1: Studies assessing the accuracy of prognostic scores in AVB; Table S2: Rockall score; Table S3: Glasgow–Blatchford score; Table S4: Modified Glasgow–Blatchford score; Table S5: AIMS65 score; Table S6: Child–Turcotte–Pugh and CTP–creatinine scores; Table S7: MELD, MELD-3, MELD–Na, UKELD, ALBi, and PALBi scores.

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Abbreviations

The following abbreviations are used in this manuscript:

ALBi	Albumin-Bilirubin score
AUC	Area Under the Curve
AVB	Acute Variceal Bleeding
CTP	Child–Turcotte–Pugh score
GBS	Glasgow–Blatchford score
GOV	Gastroesophageal Varices
HCC	Hepatocellular Carcinoma
INR	International Normalized Ratio
MAFLD	Metabolic Fatty Liver Disease
MELD	Model for End-Stage Liver Disease
mGBS	Modified Glasgow–Blatchford score
NLR	Neutrophil-to-Lymphocyte Ratio
PALBi	Platelet–Albumin–Bilirubin score
SIRS	Systemic Inflammatory Response Score
TIPS	Transjugular Intrahepatic Portosystemic Shunt
UGIB	Upper Gastrointestinal Bleeding
UKELD	United Kingdom model for End-Stage Liver Disease

References

1. Yang, L.; Sun, R.; Wei, N.; Chen, H. Systematic review and meta-analysis of risk scores in prediction for the clinical outcomes in patients with acute variceal bleeding. *Ann. Med.* **2021**, *53*, 1806–1815. [\[CrossRef\]](#) [\[PubMed\]](#)
2. Voicu, M.N.; Popescu, F.; Florescu, D.N.; Rogoveanu, I.; Turcu-Stolica, A.; Gheonea, D.I.; Iovanescu, V.F.; Iordache, S.; Cazacu, S.M.; Ungureanu, B.S. Clostridioides difficile Infection among Cirrhotic Patients with Variceal Bleeding. *Antibiotics* **2021**, *10*, 731. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Weichselbaum, L.; Lepida, A.; Marot, A.; Trépo, E.; Moreno, C.; Deltenre, P. Salvage transjugular intrahepatic portosystemic shunt in patients with cirrhosis and refractory variceal bleeding: A systematic review with meta-analysis. *United Eur. Gastroenterol. J.* **2022**, *10*, 874–887. [\[CrossRef\]](#)
4. Singh, S.; Chandan, S.; Vinayek, R.; Aswath, G.; Facciorusso, A.; Maida, M. Comprehensive approach to esophageal variceal bleeding: From prevention to treatment. *World J. Gastroenterol.* **2024**, *30*, 4602–4608. [\[CrossRef\]](#)
5. de Franchis, R. Revising consensus in portal hypertension: Report of the Baveno V consensus workshop on methodology of diagnosis and therapy in portal hypertension. *J. Hepatol.* **2010**, *53*, 762–768. [\[CrossRef\]](#)
6. de Franchis, R.; Baveno, V.I.F. Expanding consensus in portal hypertension: Report of the Baveno VI Consensus Workshop: Stratifying risk and individualizing care for portal hypertension. *J. Hepatol.* **2015**, *63*, 743–752. [\[CrossRef\]](#)
7. Cazacu, S.M.; Alexandru, D.O.; Statie, R.-C.; Iordache, S.; Ungureanu, B.S.; Iovănescu, V.F.; Popa, P.; Sacerdotianu, V.M.; Neagoe, C.D.; Florescu, M.M. The Accuracy of Pre-Endoscopic Scores for Mortality Prediction in Patients with Upper GI Bleeding and No Endoscopy Performed. *Diagnostics* **2023**, *13*, 1188. [\[CrossRef\]](#)
8. Saltzman, J.R.; Tabak, Y.P.; Hyett, B.H.; Sun, X.; Travis, A.C.; Johannes, R.S. A simple risk score accurately predicts in-hospital mortality, length of stay, and cost in acute upper GI bleeding. *Gastrointest. Endosc.* **2011**, *74*, 1215–1224. [\[CrossRef\]](#)
9. Reverter, E.; Tandon, P.; Augustin, S.; Turon, F.; Casu, S.; Bastiampillai, R.; Keough, A.; Llop, E.; González, A.; Seijo, S.; et al. A MELD-based model to determine risk of mortality among patients with acute variceal bleeding. *Gastroenterology* **2014**, *146*, 412–419.e3. [\[CrossRef\]](#)
10. Motola-Kuba, M.; Escobedo-Arzate, A.; Tellez-Avila, F.; Altamirano, J.; Aguilar-Olivos, N.; González-Angulo, A.; Zamarripa-Dorsey, F.; Uribe, M.; Chávez-Tapia, N.C. Validation of prognostic scores for clinical outcomes in cirrhotic patients with acute variceal bleeding. *Ann Hepatol.* **2016**, *15*, 895–901. [\[PubMed\]](#)
11. Al-Freah, M.A.B.; Gera, A.; Martini, S.; McPhail, M.J.W.; Devlin, J.; Harrison, P.M.; Shawcross, D.; Abeles, R.D.; Taylor, N.J.; Auzinger, G.; et al. Comparison of scoring systems and outcome of patients admitted to a liver intensive care unit of a tertiary referral centre with severe variceal bleeding. *Aliment. Pharmacol. Ther.* **2014**, *39*, 1286–1300. [\[CrossRef\]](#)
12. Sempere, L.; Palazón, J.M.; Sánchez-Payá, J.; Pascual, S.; De Madaria, E.; Poveda, M.J.; Carnicer, F.; Zapater, P.; Pérez-Mateo, M. Assessing the short- and medium-term prognosis of patients with cirrhosis and acute variceal bleeding. *Rev. Esp. Enferm. Dig.* **2009**, *101*, 236–248.
13. Huy, D.Q.; Van Chung, N.; Dong, D.T. Value of Some Scoring Systems for the Prognosis of Rebleeding and In-Hospital Mortality in Liver Cirrhosis with Acute Variceal Bleeding. *Gastroenterol. Insights* **2023**, *14*, 144–155. [\[CrossRef\]](#)
14. Hassanien, M.; El-Ghannam, M.; El-Talkawy, M.D.; Abdelrahman, Y.; El Attar, G.; Abu Taleb, H. Risk Scoring Systems to Predict In-Hospital Mortality in Patients with Acute Variceal Bleeding due to Hepatitis C Virus induced Liver Cirrhosis. *Gastroenterol. Insights* **2018**, *9*, 13–18. [\[CrossRef\]](#)
15. Quan, H.; Li, B.; Couris, C.M.; Fushimi, K.; Graham, P.; Hider, P.; Januel, J.-M.; Sundararajan, V. Updating and validating the Charlson comorbidity index and score for risk adjustment in hospital discharge abstracts using data from 6 countries. *Am. J. Epidemiol.* **2011**, *173*, 676–682. [\[CrossRef\]](#)
16. Cazacu, S.M.; Parscoveanu, M.; Cartu, D.; Moraru, E.; Rogoveanu, I.; Ungureanu, B.S.; Iordache, S.; Florescu, D.N.; Iovanescu, V.F.; Dragomir, M.I. NLR48 is Better Than CRP, and mCTSI, and Similar to BISAP and SOFA Scores for Mortality Prediction in Acute Pancreatitis: A Comparison of 6 Scores. *J. Inflamm. Res.* **2023**, *16*, 4793–4804. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Dertli, R.; Toka, B.; Asil, M.; Kayar, Y.; Karakarcayıldız, A.; Göktepe, M.H.; Bıyık, M.; Konur, Ş.; Ataseven, H. Can neutrophil-lymphocyte ratio predict mortality in acute non-variceal upper gastrointestinal bleeding? *Ulus Travma Acil Cerrahi Derg.* **2022**, *28*, 626–633. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Chen, X.; Li, X.; Zhao, G.; Xu, W. Neutrophil-lymphocyte ratio predict outcome of upper gastrointestinal bleeding in emergency. *Front. Med.* **2024**, *11*, 1366715. [\[CrossRef\]](#) [\[PubMed\]](#)
19. Qiu, L.; Jin, X.; Wang, J.-J.; Tang, X.-D.; Fang, X.; Li, S.-J.; Wang, F.; Chen, X.-L. Plasma Neutrophil-to-Lymphocyte Ratio on the Third Day Postburn is Associated with 90-Day Mortality Among Patients with Burns Over 30% of Total Body Surface Area in Two Chinese Burns Centers. *J. Inflamm. Res.* **2021**, *14*, 519–526. [\[CrossRef\]](#)
20. Guo, J.; Wang, D.; Jia, J.; Zhang, J.; Liu, Y.; Lu, J.; Zhao, X.; Yan, J. Neutrophil-to-Lymphocyte Ratio, Lymphocyte-to-Monocyte Ratio and Platelet-to-Lymphocyte Ratio as Predictors of Short- and Medium-term Outcomes in Ischemic Stroke Patients with Atrial Fibrillation. *J. Inflamm. Res.* **2024**, *17*, 6661–6672. [\[CrossRef\]](#)

21. Li, W.; Hou, M.; Ding, Z.; Liu, X.; Shao, Y.; Li, X. Prognostic Value of Neutrophil-to-Lymphocyte Ratio in Stroke: A Systematic Review and Meta-Analysis. *Front. Neurol.* **2021**, *12*, 686983. [\[CrossRef\]](#)
22. Jiang, X.; Zhou, L.; Chen, Y.; Tang, Y.; Jiang, X. Neutrophil-to-Lymphocyte ratio on admission predicts gastrointestinal bleeding in acute basal ganglia hemorrhage. *J. Clin. Lab. Anal.* **2022**, *36*, e24679. [\[CrossRef\]](#) [\[PubMed\]](#)
23. Xu, Q.B.; Fan, S.B.; Wang, L.B.; Zheng, J.B.; Wan, Y.B.; Tian, R.B.; Xia, J.B.; Zhao, Z.B. Circulating/cerebrospinal T lymphocytes as indicators of clinical prognosis in intracerebral hemorrhage: A prospective study. *Medicine* **2024**, *103*, e35827. [\[CrossRef\]](#) [\[PubMed\]](#)
24. Chen, Y.; Chen, S.; Han, Y.; Xu, Q.; Zhao, X. Neutrophil-to-Lymphocyte Ratio and Platelet-to-Lymphocyte Ratio are Important Indicators for Predicting in-Hospital Death in Elderly AMI Patients. *J. Inflamm. Res.* **2023**, *16*, 2051–2061. [\[CrossRef\]](#)
25. Xue, J.; Ma, D.; Jiang, J.; Liu, Y. Diagnostic and Prognostic Value of Immune/Inflammation Biomarkers for Venous Thromboembolism: Is It Reliable for Clinical Practice? *J. Inflamm. Res.* **2021**, *14*, 5059–5077. [\[CrossRef\]](#)
26. Wu, H.; Cao, T.; Ji, T.; Luo, Y.; Huang, J.; Ma, K. Predictive value of the neutrophil-to-lymphocyte ratio in the prognosis and risk of death for adult sepsis patients: A meta-analysis. *Front. Immunol.* **2024**, *15*, 1336456. [\[CrossRef\]](#)
27. Kosidło, J.W.; Wolszczak-Biedrzycka, B.; Matowicka-Karna, J.; Dymicka-Piekarska, V.; Dorf, J. Clinical Significance and Diagnostic Utility of NLR, LMR, PLR and SII in the Course of COVID-19: A Literature Review. *J. Inflamm. Res.* **2023**, *16*, 539–562. [\[CrossRef\]](#) [\[PubMed\]](#)
28. Ulloque-Badaracco, J.R.; Ivan Salas-Tello, W.; Al-Kassab-Córdova, A.; Alarcón-Braga, E.A.; Benites-Zapata, V.A.; Maguiña, J.L.; Hernandez, A.V. Prognostic value of neutrophil-to-lymphocyte ratio in COVID-19 patients: A systematic review and meta-analysis. *Int. J. Clin. Pract.* **2021**, *75*, e14596. [\[CrossRef\]](#)
29. Turgunova, L.; Mekhantseva, I.; Akhmaltdinova, L.; Kostinov, M.; Zhumadilova, Z.; Turmukhambetova, A. Association of sTREM-1 and Neutrophil-to-Lymphocyte Ratio as Prognostic Markers in COVID-19 Short- and Medium-term Mortality. *J. Inflamm. Res.* **2023**, *16*, 5807–5817. [\[CrossRef\]](#) [\[PubMed\]](#)
30. Sarkar, S.; Khanna, P.; Singh, A.K. The Impact of Neutrophil-Lymphocyte Count Ratio in COVID-19: A Systematic Review and Meta-Analysis. *J. Intensiv. Care Med.* **2022**, *37*, 857–869. [\[CrossRef\]](#)
31. Cupp, M.A.; Cariolou, M.; Tzoulaki, I.; Aune, D.; Evangelou, E.; Berlanga-Taylor, A.J. Neutrophil to lymphocyte ratio and cancer prognosis: An umbrella review of systematic reviews and meta-analyses of observational studies. *BMC Med.* **2020**, *18*, 360. [\[CrossRef\]](#)
32. Qiu, Z.; Huang, C.; Xu, C.; Xu, Y. Predictive role of neutrophil-to-lymphocyte ratio in metabolic syndrome: Meta-analysis of 70,937 individuals. *BMC Endocr. Disord.* **2024**, *24*, 155. [\[CrossRef\]](#)
33. Shavakhi, M.; Nourigheimasi, S.; Dioso, E.; Goutnik, M.; Lucke-Wold, B.; Khanzadeh, S.; Heidari, F.; Granito, A. Prognostic Role of Neutrophil to Lymphocyte Ratio in Nonalcoholic Fatty Liver Disease: A Systematic Review and Meta-Analysis. *Can. J. Gastroenterol. Hepatol.* **2022**, *2022*, 1554079. [\[CrossRef\]](#)
34. Perry, L.A.; Liu, Z.; Loth, J.; Penny-Dimri, J.C.; Plummer, M.; Segal, R.; Smith, J. Perioperative Neutrophil-Lymphocyte Ratio Predicts Mortality After Cardiac Surgery: Systematic Review and Meta-Analysis. *J. Cardiothorac. Vasc. Anesthesia* **2022**, *36*, 1296–1303. [\[CrossRef\]](#) [\[PubMed\]](#)
35. Zhang, L.; Zhang, W.; Wang, J.; Jin, Q.; Ma, D.; Huang, R. Neutrophil-to-lymphocyte ratio predicts 30-, 90-, and 180-day readmissions of patients with hepatic encephalopathy. *Front. Med.* **2023**, *10*, 1185182. [\[CrossRef\]](#)
36. Hong, C.-M.; Su, T.-H.; Hsu, S.-J.; Tseng, T.-C.; Liu, C.-H.; Yang, H.-C.; Kao, J.-H.; Chen, P.-J.; Cheng, P.-N.; Hung, C.-H.; et al. Addition of neutrophil-to-lymphocyte ratio to Pre-DAA FIB-4 does not increase prediction value for de novo liver complications in hepatitis C. *J. Formos. Med. Assoc.* **2024**, *in press*. [\[CrossRef\]](#) [\[PubMed\]](#)
37. Tang, H.-H.; Zhou, L.-F.; Wang, C.-X.; Zha, Y.; Fan, C.; Zhong, B.-Y.; Zhu, X.-L.; Wang, W.-D. The Value of Neutrophil-to-Lymphocyte Ratio in Predicting Mortality After Transjugular Intrahepatic Portosystemic Shunt Placement. *J. Inflamm. Res.* **2024**, *17*, 5211–5221. [\[CrossRef\]](#) [\[PubMed\]](#)
38. Zhang, L.; Zhang, Y. Diagnostic Values of Blood Count Values and Ratios in Distinguishing between Peptic Ulcer Bleeding and Esophagogastric Variceal Bleeding. *Clin. Lab.* **2020**, *66*, 655–660. [\[CrossRef\]](#)
39. Chen, L.; Tong, C.; Zhao, X.; Xu, C. Neutrophil-to-lymphocyte ratio and platelet-to-lymphocyte ratio as potential diagnostic markers for rebleeding in patients with esophagogastric variceal bleeding. *Open Life Sci.* **2024**, *19*, 20220852. [\[CrossRef\]](#)
40. Jamil, Z.; Perveen, S.; Khalid, S.; Aljuaid, M.; Shahzad, M.; Ahmad, B.; Waheed, Y. Child-Pugh Score, MELD Score and Glasgow Blatchford Score to Predict the In-Hospital Outcome of Portal Hypertensive Patients Presenting with Upper Gastrointestinal Bleeding: An Experience from Tertiary Healthcare System. *J. Clin. Med.* **2022**, *11*, 6654. [\[CrossRef\]](#)
41. Kim, W.R.; Mannalithara, A.; Heimbach, J.K.; Kamath, P.S.; Asrani, S.K.; Biggins, S.W.; Wood, N.L.; Gentry, S.E.; Kwong, A.J. MELD 3.0: The Model for End-Stage Liver Disease Updated for the Modern Era. *Gastroenterology* **2021**, *161*, 1887–1895.e4. [\[CrossRef\]](#)
42. Rout, G.; Sharma, S.; Gunjan, D.; Kedia, S.; Nayak, B. Shalimar Comparison of various prognostic scores in variceal and non-variceal upper gastrointestinal bleeding: A prospective cohort study. *Indian J. Gastroenterol.* **2019**, *38*, 158–166. [\[CrossRef\]](#)

43. Chandnani, S.; Rath, P.; Udgirkar, S.S.; Sonthalia, N.; Contractor, Q.; Jain, S. Clinical utility of risk scores in variceal bleeding. *Arq. de Gastroenterol.* **2019**, *56*, 286–293. [\[CrossRef\]](#)
44. Reed, E.A.; Dalton, H.; Blatchford, O.; Ashley, D.; Mowat, C.; Gaya, D.R.; Cahill, A.; Warshaw, U.; Hare, N.; Groome, M.; et al. Is the Glasgow Blatchford score useful in the risk assessment of patients presenting with variceal haemorrhage? *Eur J Gastroenterol Hepatol. Eur. J. Gastroenterol. Hepatol.* **2014**, *26*, 432–437. [\[CrossRef\]](#) [\[PubMed\]](#)
45. Aluizio, C.L.d.S.; Montes, C.G.; Reis, G.F.S.R.; Nagasako, C.K. Risk stratification in acute variceal bleeding: Far from an ideal score. *Clinics* **2021**, *76*, e2921. [\[CrossRef\]](#)
46. Wang, F.; Cui, S.; Wang, F.; Li, F.; Tang, F.; Zhang, X.; Gao, Y.; Lv, H. Different scoring systems to predict 6-week mortality in cirrhosis patients with acute variceal bleeding: A retrospective analysis of 202 patients. *Scand. J. Gastroenterol.* **2018**, *53*, 885–890. [\[CrossRef\]](#) [\[PubMed\]](#)
47. Budimir, I.; Gradišer, M.; Nikolić, M.; Baršić, N.; Ljubičić, N.; Kralj, D.; Budimir, I., Jr. Glasgow Blatchford, pre-endoscopic Rockall and AIMS65 scores show no difference in predicting rebleeding rate and mortality in variceal bleeding. *Scand. J. Gastroenterol.* **2016**, *51*, 1375–1379. [\[CrossRef\]](#)
48. Mouelhi, L.; Ayadi, H.; Zaimi, Y.; Daboussi, O.; Salem, M.; Debbech, R.; Houissa, F.; Najjar, T. Predictive scores of early mortality from variceal gastrointestinal bleeding in cirrhotic patients. *Tunis. Med.* **2016**, *94*, 670.
49. Robertson, M.; Majumdar, A.; Boyapati, R.; Chung, W.; Worland, T.; Terbah, R.; Wei, J.; Lontos, S.; Angus, P.; Vaughan, R. Risk stratification in acute upper GI bleeding: Comparison of the AIMS65 score with the Glasgow-Blatchford and Rockall scoring systems. *Gastrointest. Endosc.* **2016**, *83*, 1151–1160. [\[CrossRef\]](#) [\[PubMed\]](#)
50. Tantai, X.-X.; Liu, N.; Yang, L.-B.; Wei, Z.-C.; Xiao, C.-L.; Song, Y.-H.; Wang, J.-H. Prognostic value of risk scoring systems for cirrhotic patients with variceal bleeding. *World J. Gastroenterol.* **2019**, *25*, 6668–6680. [\[CrossRef\]](#)
51. Sarwar, S.; Dilshad, A.; Khan, A.A.; Alam, A.; Butt, A.K.; Tariq, S.; Ahmad, I. Predictive value of Rockall score for rebleeding and mortality in patients with variceal bleeding. *J. Coll. Physicians Surg. Pak.* **2007**, *17*, 253–256.
52. Flores-Rendón, Á.R.; González-González, J.A.; García-Compeán, D.; Maldonado-Garza, H.J.; Garza-Galindo, A.A. Model for end stage of liver disease (MELD) is better than the Child-Pugh score for predicting in-hospital mortality related to esophageal variceal bleeding. *Ann. Hepatol.* **2008**, *7*, 230–234. [\[CrossRef\]](#)
53. Lu, X.; Zhang, X.; Chen, H. Comparison of the AIMS65 score with the Glasgow-Blatchford and Rockall scoring systems for the prediction of the risk of in-hospital death among patients with upper gastrointestinal bleeding. *Rev Esp. Enferm. Dig.* **2020**, *112*, 467–473. [\[CrossRef\]](#)
54. Mohammad, A.N.; Morsy, K.H.; Ali, M.A. Variceal bleeding in cirrhotic patients: What is the best prognostic score? *Turk. J. Gastroenterol.* **2016**, *27*, 464–469. [\[CrossRef\]](#)
55. Yan, J.; Zhihua, G.; Yuanyuan, S.; Shuyan, X.; Jianguo, S. Clinical study of AIMS65 score for risk assessment of esophageal and gastric variceal bleeding in liver cirrhosis. *J. Clinical Focus.* **2018**, *33*, 498. [\[CrossRef\]](#)
56. Lee, J.Y.; Lee, J.H.; Kim, S.J.; Choi, D.R.; Kim, K.H.; Kim, Y.B.; Kim, H.Y.; Yoo, J.Y. Comparison of predictive factors related to the mortality and rebleeding caused by variceal bleeding: Child-Pugh score, MELD score, and Rockall score. *Korean J. Hepatol.* **2002**, *8*, 458–464.
57. Elshaarawy, O.; Allam, N.; Abdelsameea, E.; Gomaa, A.; Waked, I. Platelet-albumin-bilirubin score—A predictor of outcome of acute variceal bleeding in patients with cirrhosis. *World J. Hepatol.* **2020**, *12*, 99–107. [\[CrossRef\]](#)
58. Fortune, B.E.; Garcia-Tsao, G.; Ciarleglio, M.; Deng, Y.; Fallon, M.B.; Sigal, S.; Chalasani, N.P.; Lim, J.K.; Reuben, A.; Vargas, H.E.; et al. Child-Turcotte-Pugh Class is Best at Stratifying Risk in Variceal Hemorrhage: Analysis of a US Multicenter Prospective Study. *J. Clin. Gastroenterol.* **2017**, *51*, 446–453. [\[CrossRef\]](#)
59. Rout, G.; Sharma, S.; Gunjan, D.; Kedia, S.; Saraya, A.; Nayak, B.; Singh, V.; Kumar, R. Shalimar Development and Validation of a Novel Model for Outcomes in Patients with Cirrhosis and Acute Variceal Bleeding. *Dig. Dis. Sci.* **2019**, *64*, 2327–2337. [\[CrossRef\]](#)
60. Iino, C.; Shimoyama, T.; Igarashi, T.; Aihara, T.; Ishii, K.; Sakamoto, J.; Tono, H.; Fukuda, S. Usefulness of the Glasgow-Blatchford score to predict 1-week mortality in patients with esophageal variceal bleeding. *Eur. J. Gastroenterol. Hepatol.* **2017**, *29*, 547–551. [\[CrossRef\]](#)
61. Wong, M.-W.; Chen, M.-J.; Chen, H.-L.; Kuo, Y.-C.; Lin, I.-T.; Wu, C.-H.; Lee, Y.-K.; Cheng, C.-H.; Bair, M.-J.; Lin, H.-C. Application of chronic liver failure-sequential organ failure assessment score for the prediction of mortality after esophageal variceal hemorrhage post endo-scope ligation. *PLoS ONE* **2017**, *12*, e0182529. [\[CrossRef\]](#) [\[PubMed\]](#)
62. Liu, Y.; Wu, S.; Cai, S.; Xie, B. The prognostic evaluation of ALBI score in endoscopic treatment of esophagogastric varices hemorrhage in liver cirrhosis. *Sci. Rep.* **2024**, *14*, 780. [\[CrossRef\]](#) [\[PubMed\]](#)
63. Zou, D.; Qi, X.; Zhu, C.; Ning, Z.; Hou, F.; Zhao, J.; Peng, Y.; Li, J.; Deng, H.; Guo, X. Albumin-bilirubin score for predicting the in-hospital mortality of acute upper gastrointestinal bleeding in liver cirrhosis: A retrospective study. *Turk. J. Gastroenterol.* **2016**, *27*, 180–186. [\[CrossRef\]](#)

64. Zhao, Y.; Ren, M.; Lu, G.; Lu, X.; Yin, Y.; Zhang, D.; Wang, X.; Ma, W.; Li, Y.; Cai, G.; et al. The Prognosis Analysis of Liver Cirrhosis with Acute Variceal Bleeding and Validation of Current Prognostic Models: A Large Scale Retrospective Cohort Study. *BioMed Res. Int.* **2020**, *2020*, 7372868. [[CrossRef](#)] [[PubMed](#)]
65. Zhong, B.-Y.; Tang, H.-H.; Wang, W.-S.; Shen, J.; Zhang, S.; Li, W.-C.; Yin, Y.; Yang, J.; Liu, F.; Ni, C.-F.; et al. Performance of artificial intelligence for prognostic prediction with the albumin-bilirubin and platelet-albumin-bilirubin for cirrhotic patients with acute variceal bleeding undergoing early transjugular intrahepatic portosystemic shunt. *Eur. J. Gastroenterol. Hepatol.* **2021**, *33*, e153–e160. [[CrossRef](#)]
66. Bae, W.K.; Lee, J.S.; Kim, N.H.; Kim, K.A.; Moon, Y.S.; Oh, M.K. Usefulness of DeltaMELD/month for prediction of the mortality in the first episode of variceal bleeding patients with liver cirrhosis: Comparison with CTP, MELD score and DeltaCTP/month. *Korean J Hepatol.* **2007**, *13*, 51–60. (In Abstract)
67. Horvatits, T.; Mahmud, N.; Serper, M.; Seiz, O.; Reher, D.; Drolz, A.; Sarnast, N.; Gu, W.; Erasmus, H.P.; Allo, G.; et al. MELD-Lactate Predicts Poor Outcome in Variceal Bleeding in Cirrhosis. *Dig. Dis. Sci.* **2023**, *68*, 1042–1050. [[CrossRef](#)]
68. Rudler, M.; Bureau, C.; Carbonell, N.; Mathurin, P.; Saliba, F.; Mallat, A.; Massard, J.; Golmard, J.; Bernard-Chabert, B.; Dib, N.; et al. Recalibrated MELD and hepatic encephalopathy are prognostic factors in cirrhotic patients with acute variceal bleeding. *Liver Int.* **2018**, *38*, 469–476. [[CrossRef](#)]
69. Buckholz, A.; Wong, R.; Curry, M.P.; Baffy, G.; Chak, E.; Rustagi, T.; Mohanty, A.; Fortune, B.E. MELD, MELD 3.0, versus Child score to predict mortality after acute variceal hemorrhage: A multicenter US cohort. *Hepatol. Commun.* **2023**, *7*, e0258. [[CrossRef](#)]
70. Xavier, S.A.; Vilas-Boas, R.; Carvalho, P.B.; Magalhães, J.T.; Marinho, C.M.; Cotter, J.B. Assessment of prognostic performance of Albumin-Bilirubin, Child-Pugh, and Model for End-stage Liver Disease scores in patients with liver cirrhosis complicated with acute upper gastrointestinal bleeding. *Eur. J. Gastroenterol. Hepatol.* **2018**, *30*, 652–658. [[CrossRef](#)]
71. Altamirano, J.; Zapata, L.; Augustin, S.; Muntaner, L.; González-Angulo, A.; Ortiz, A.L.; Degiau, L.; Garibay, J.; Camargo, L.; Genescà, J. Predicting 6-week mortality after acute variceal bleeding: Role of Classification and Regression Tree analysis. *Ann. Hepatol.* **2009**, *8*, 308–315. [[CrossRef](#)]
72. Chen, J.; Luo, S.; Tang, F.; Han, M.; Zheng, J.; Deng, M.; Luo, G. Development and validation of a practical prognostic nomogram for evaluating inpatient mortality of cirrhotic patients with acute variceal hemorrhage. *Ann. Hepatol.* **2023**, *28*, 101086. [[CrossRef](#)] [[PubMed](#)]
73. Krige, J.; Spence, R.T.; Jonas, E.; Hoogerboord, M.; Ellsmere, J. A New Recalibrated Four-Category Child-Pugh Score Performs Better than the Original Child-Pugh and MELD Scores in Predicting In-Hospital Mortality in Decompensated Alcoholic Cirrhotic Patients with Acute Variceal Bleeding: A Real-World Cohort Analysis. *World J. Surg.* **2020**, *44*, 241–246. [[CrossRef](#)]
74. Lin, S.; Zheng, J.; Zhou, C.; Feng, S.; Lin, Z. Developing a nomogram for forecasting the 28-day mortality rate of individuals with bleeding esophageal varices using MELD scores. *J. Gastrointest. Surg.* **2024**, *28*, 1646–1653. [[CrossRef](#)]
75. Lyles, T.; Elliott, A.; Rockey, D.C. A risk scoring system to predict in-hospital mortality in patients with cirrhosis presenting with upper gastrointestinal bleeding. *J. Clin. Gastroenterol.* **2014**, *48*, 712–720. [[CrossRef](#)]
76. Magder, L.S.; Regev, A.; Mindikoglu, A.L. Comparison of seven liver allocation models with respect to lives saved among patients on the liver transplant waiting list. *Transpl. Int.* **2012**, *25*, 409–415. [[CrossRef](#)]
77. Chirapongsathorn, S.; Akkarachinores, K.; Chaiprasert, A. Development and validation of prognostic model to predict mortality among cirrhotic patients with acute variceal bleeding: A retrospective study. *JGH Open* **2021**, *5*, 658–663. [[CrossRef](#)]
78. Conejo, I.; Guardascione, M.A.; Tandon, P.; Cachero, A.; Castellote, J.; Abraldes, J.G.; Amitrano, L.; Genescà, J.; Augustin, S. Multicenter External Validation of Risk Stratification Criteria for Patients With Variceal Bleeding. *Clin. Gastroenterol. Hepatol.* **2018**, *16*, 132–139. [[CrossRef](#)]
79. Sarwar, S.; Khan, A.A.; Tarique, S. Comparison of MELD, Child Pugh score and Rockall score for predicting rebleeding and in-hospital mortality in patients of variceal bleeding. *J. Coll. Physicians Surg. Pak.* **2008**, *18*, 524–525.
80. Bai, Z.; Li, B.; Lin, S.; Liu, B.; Li, Y.; Zhu, Q.; Wu, Y.; Yang, Y.; Tang, S.; Meng, F.; et al. Development and Validation of CAGIB Score for Evaluating the Prognosis of Cirrhosis with Acute Gastrointestinal Bleeding: A Retrospective Multicenter Study. *Adv. Ther.* **2019**, *36*, 3211–3220. [[CrossRef](#)]

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