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Original Article INTERNAL MEDICINE

The role of BUN/creatinine ratio in determining the severity of gastrointestinal bleeding and bleeding localization

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ABSTRACT

OBJECTIVE: The aim of the study is to evaluate an established biomarker such as blood urea nitrogen (BUN)/Creatinine ratio in predicting upper gastrointestinal bleeding versus lower GI and stratify its severity. The aim of this study is to evaluate the diagnostic performance in clinical practice and predestination as a prognostic factor, including admission to an intensive care unit (ICU) or mortality rate for BUN/Creatinine ratio.

METHODS: A total of 300 patients controlled in our hospital between January 2022 and January 2024 were evaluated retrospectively due to hospitalization by acute GI bleeding. Gastroscopy and/or colonoscopy were used to stratify patients into the upper or lower GI bleeding group. Data included demographic information, clinical presentation history and vital signs, comorbidity status, medication use, clinical outcomes and laboratory tests including hemoglobin, hematocrit, urea, creatinine levels and so on. The BUN/Creatinine ratio was determined and correlated with site as well as severity of bleeding. Statistical techniques, such as logistic regression and receiver operating characteristic (ROC) analysis, were used to assess the diagnostic performance of the ratio and to choose a cut-off value.

RESULTS: Among the 300 patients, 215 (71.7% had upper GI bleeding, and 85 (28.3% had lower GI bleeding. Hematemesis and melena were significantly associated with upper GI bleeding, whereas hematochezia was more common in lower GI bleeding. Patients with upper GI bleeding had significantly higher BUN, urea, and BUN/Creatinine ratios, while hemoglobin and hematocrit levels were lower. The optimal BUN/Creatinine cut-off value of 23.3 demonstrated high sensitivity (89.3%) and specificity (94.1%) for distinguishing between upper and lower GI bleeding. Multivariate analysis revealed BUN/Creatinine ratio, hematochezia and endoscopic intervention as an independent predictor of bleeding location. Patients with BUN/Creatinine ratio >23.3 showed increased frequency of red blood cell transfusion, endoscopic intervention, and mortality.

CONCLUSION: The BUN/Creatinine ratio is a sensitive, noninvasive biomarker for distinguishing between upper and lower GI bleed and severity. Its introduction into clinical practice may enhance the decision process and patient care, especially in critical care contexts. Additional research is indicated to confirm these results and to define standardized cut-off values for wider use.

Keywords: Acute gastrointestinal bleeding; BUN/Creatinine ratio; lower gastrointestinal bleeding; upper gastrointestinal bleeding.

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Acute gastrointestinal (GI) bleeding is a medical condition that requires immediate treatment and action, as it is the major factor for the high rates of morbidity and mortality all over the world. GI bleeding can be subdivided into the upper and the lower parts and the patients presentation ranges from very mild symptoms to severe life-threatening situations that depend on the volume and cause of the bleeding. The patient's clinical condition

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should first be restored to equilibrium before a quick assessment of the bleeding site and degree is done and then adequate management can be planned and implemented.

On the other hand, in circumstances of upper and lower GI bleeding, the ligament of Treitz is employed as an anatomic landmark to distinguish between upper and lower GI bleeding. Although endoscopy is viewed as the gold standard for detecting the bleeding site, its invasive nature, and limited immediate availability emphasize the importance of alternative non-invasive diagnostic methods in hospitals. Here, the clinical parameters of the patient as well as the laboratory test results are applied in predicting the severity and the possible location of the bleeding.

The blood urea nitrogen/creatinine (BUN/Creatinine) ratio is raised as a biomarker that could both locate and reveal the severity of bleeding in GI hemorrhage patients [1, 2]. In upper GI bleeding, increased urea levels are often seen as a result of the metabolism of blood that is absorbed in the gastrointestinal tract, though this is relatively less noticed in lower GI bleeding. Thus, the BUN/creatinine ratio has been considered a likely predictor of high and low GI bleeding. Furthermore, this ratio may be a prognosis tool in the evaluation of the severity of bleeding.

In the literature, the BUN/Creatinine ratio in gastrointestinal hemorrhage is examined and its function is proven. Compared to other diagnostic tools, such as imaging studies or risk scoring systems like the Glasgow-Blatchford or Rockall scores, the BUN/Creatinine ratio offers a simpler, faster, and cost-effective option that can be readily applied even in resource-limited settings. However, it is not without limitations, and its utility may be enhanced when used in conjunction with other clinical and laboratory markers.

The present study is based on the predictive value of the BUN/creatinine ratio, and the percentages of it having future prediction of the location, in such patients with GI loss.

MATERIALS AND METHODS

This investigation was performed on 300 patients who were diagnosed with acute GI bleeding and treated at the Internal Medicine Clinic of Health Sciences University Sisli Hamidiye Etfal Training and Research Hospital between January 1, 2022, and January 1, 2024. Enrollment criteria were patients aged 18 and above of both genders who were diagnosed with a diagnosis of acute GI bleeding.

Highlight key points

- Patients with upper GI bleeding had significantly higher BUN, urea, and BUN/Creatinine ratios, and lower hemoglobin and hematocrit levels.
- A BUN/Creatinine ratio cut-off value of 23.3 showed high sensitivity (89.3%) and specificity (94.1%) in distinguishing between upper and lower GI bleeding.
- Hematochezia, BUN/Creatinine ratio, and need for endoscopic intervention were independent predictors of bleeding location.
- Patients with a BUN/Creatinine ratio >23.3 had higher rates of red blood cell transfusion, endoscopic intervention, and mortality.

The analysis was performed as a retrospective study. Patients presenting with symptoms of acute hematemesis, melena, or hematochezia were included in the study. These patients underwent gastroscopy and/or colonoscopy examinations to determine the cause of bleeding.

If the bleeding was due to a lesion located above the ligament of Treitz, this was diagnosed as an upper GI bleeding. If no bleeding source was found on gastroscopy but was identified on colonoscopy, it was classified as lower GI bleeding.

Age, gender, smoking and alcohol use, presenting symptoms (hematemesis, melena, or hematochezia), pulse, systolic and diastolic blood pressure, comorbidities (diabetes mellitus, hypertension, chronic obstructive pulmonary disease, ischemic heart disease, cerebrovascular event), history of previous GI bleeding, use of medications (aspirin, clopidogrel, nonsteroidal anti-inflammatory drugs, oral anticoagulants, warfarin, or low molecular weight heparin), blood transfusion, rebleeding, endoscopic or surgical treatment, ICU, and mortality were the collected data. Laboratory parameters such as leukocyte and red blood cell counts, hemoglobin concentration, hematocrit level, platelet count, urea, creatinine, albumin, and INR were also measured.

The BUN/Creatinine ratio is obtained by dividing the serum blood urea nitrogen (BUN) level (mg/dL) by the serum creatinine level (mg/dL). The utility of the BUN/Creatinine ratio in differentiating between upper and lower GI bleeding confirmed by gastroscopy and/or colonoscopy was evaluated. The study further elaborated on the use of the BUN/Creatinine ratio concerning the prediction of the bleeding level such as the requirement of ICU admission and mortality rate.

Rebleeding was defined as hemodynamic instability or the reduction of hemoglobin levels by 2 g/dL or more as the outcome of the follow-up tests after the initial treatment of bleeding, or the reoccurrence of hematemesis, melena, or hematochezia. Rebleeding was confirmed by a second endoscopic examination during the hospital stay.

Exclusion criteria were patients under 18 years of age, known hematological diseases, chronic kidney failure, malignancy, pregnancy, and those who have refused to undergo endoscopic examination or are being transferred to another hospital (Fig. 1).

Patients were in two groups, upper and lower GI bleeding, based on the source of bleeding. Demographic data and laboratory findings were compared between the groups. A cut-off value for the BUN/creatinine ratio was determined to differentiate between upper and lower GI bleeding. Furthermore, patients requiring ICU admission and/or experiencing mortality were compared with those admitted to the general ward.

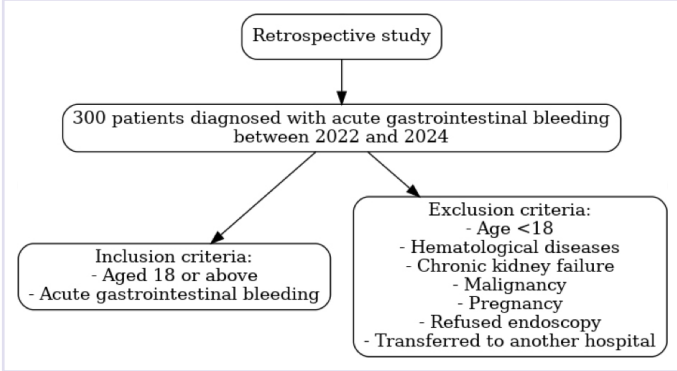

Figure 1. Patient selection and study design flowchart.

Table 1. Comparison of demographics, comorbidities, lifestyle factors, symptoms, and physical examination findings between patients with upper and lower GI bleeding

Parameter	Lower GI bleeding (n=85)		Upper GI bleeding (n=215)		p
	Mean±SD	Median	Mean±SD	Median	
Age	60.0±20.1	63.0	61.9±172	63.0	0.570[m]
Gender (%)					
Female	49.4		39.5		0.119[χ^2]
Male	50.6		60.5		
Pulse (mean±SD)	86.1±12.1	84.0	92.4±15.5	92.0	**0.000**[m]
Systolic blood pressure (mean±SD)	115.0±13.5	120.0	110.3±17.1	110.0	**0.017**[m]
Diastolic blood pressure (mean±SD)	69.2±11.0	70.0	67.5±12.4	70.0	0.087[m]
Smoking (%)	52.9		47.9		0.432[χ^2]
Alcohol use (%)	17.6		20.9		0.522[χ^2]
Hematemesis (%)	10.6		45.1		**0.000**[χ^2]
Melena (%)	31.8		81.9		**0.000**[χ^2]
Hematochezia (%)	64.7		6.0		**0.000**[χ^2]
Comorbidities (%)					
Diabetes mellitus	25.9		24.7		0.824[χ^2]
Hypertension	44.7		45.1		0.949[χ^2]
COPD	4.7		9.3		0.186[χ^2]
Ischemic heart disease	27.1		25.1		0.729[χ^2]
Cerebrovascular event	9.4		10.7		0.742[χ^2]
History of previous gastrointestinal bleeding (%)					0.365[χ^2]
No	77.6		72.6		
Yes	22.4		27.4		

m: Mann-Whitney U Test; χ^2: Chi-Square Test; COPD: Chronic obstructive pulmonary disease; SD: Standard deviation.

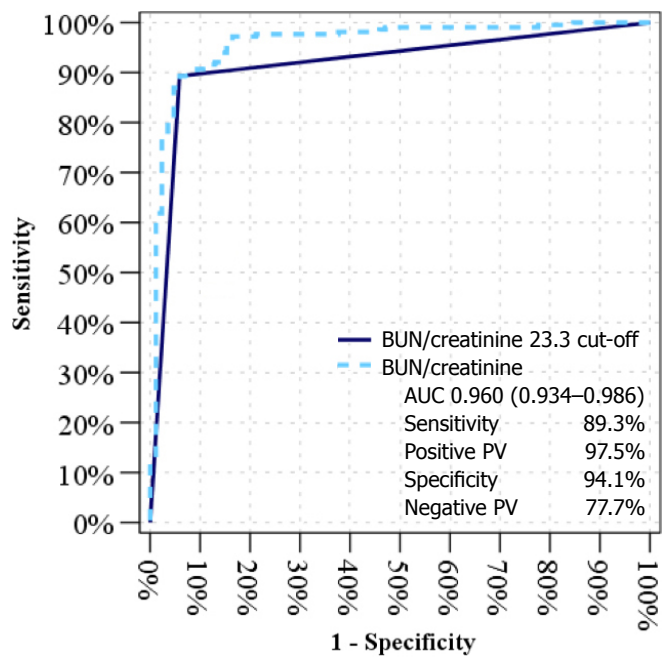

FIGURE 2. ROC curve analysis of the BUN/creatinine ratio for differentiating between lower and upper GI bleeding.

The investigation was executed after the Sisli Hamidiye Etfal Training and Research Hospital Clinical Research Ethics Committee granted approval for the procedure numbered 4540, on Sep 17, 2024. This study complies with the principles of the Helsinki Declaration.

Statistical Analysis

In numerical parametric data, the mean and standard deviation will be the forms of expression used. As well, categorical data will be shown in the form of counts and percentages. Statistical analyses and calculations will be performed using IBM SPSS Statistics 27.0 (IBM Corp. Released 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.) and MS-Excel 2016 software. The Kolmogorov-Smirnov test will be the instrument for checking the distribution of the variables. Students' t-test will be used for comparing continuous variables, but, for categorical variables, Chi-square test is the appropriate one.

The relationship between the BUN/Creatinine ratio, the severity of GI bleeding, and the bleeding location will be analyzed using logistic regression models. The association of the BUN/Creatinine ratio with various factors will be analyzed by univariate logistic regression analysis first and then by multivariate logistic regression analysis will follow. Through a receiver operating characteristic (ROC) analysis, the sensitivity, specificity, and cut-off value will be found out. A p-value of <0.05 will be one of the criteria used for statistical significance testing.

TABLE 2. Comparison of medication use and clinical outcomes between patients with upper and lower GI bleeding

	Lower GI bleeding (n=85) %	Upper GI bleeding (n=215) %	p
Medication use			
Aspirin	32.9	31.6	0.826χ^2
Clopidogrel	12.9	12.1	0.840χ^2
Nonsteroidal antiinflammatory drugs	32.9	34.9	0.749χ^2
Oral anticoagulants	10.6	7.0	0.299χ^2
Warfarin	1.2	3.3	0.314χ^2
Low molecular weight heparin	9.4	3.7	**0.048**χ^2
Red blood cell transfusion	43.5	77.7	**0.000**χ^2
Rebleeding	3.5	9.8	0.073χ^2
Endoscopic intervention	1.2	21.4	**0.000**χ^2
Surgical intervention	1.2	3.3	0.314χ^2
Intensive care unit hospitalization	3.5	7.9	0.171χ^2
Mortality	1.2	5.1	0.117χ^2

GI: Acute gastrointestinal; χ^2: Chi-Square Test.

RESULTS

The average age of patients was determined to be 61.4±18 years. Among the 300 patients who participated in the study, 173 (57.7%) were male and 127 (42.3%) were female.

The patients consisted of mainly 85 lower GI bleeding patients, while 215 had upper GI bleeding. There were no statistically significant differences between the two groups in age, gender, or history of previous GI bleeding, as well as comorbidities (Table 1).

When comparing the presenting symptoms, hematochezia was significantly more common in patients with lower GI bleeding, while hematemesis and melena were significantly more frequent in those with upper GI bleeding (Table 1).

Table 3. Comparison of laboratory parameters between lower and upper GI bleeding groups

	Lower GI bleeding (n=85)		Upper GI bleeding (n=215)		p
	Mean±SD	Median	Mean±SD	Median	
Leukocyte 10^3 mm^3	8.6±2.8	8.0	8.8±2.9	8.3	0.714[m]
Hemoglobin, g/dl	10.4±2.6	10.7	9.2±2.1	9.1	**0.000**[t]
Hematocrit, %	31.5±7.0	33.3	28.0±6.2	27.6	**0.000**[m]
Platelet 10^3 mm^3	248.5±72.0	228.0	251.4±72.9	245.0	0.724[m]
INR	1.17±0.32	1.08	1.20±0.49	1.11	0.143[m]
BUN, mg/dl	12.7±4.6	12.1	27.4±9.8	26.6	**0.000**[m]
Creatinine, mg/dl	0.79±0.17	0.78	0.81±0.20	0.80	0.492[t]
BUN/creatinine ratio	16.3±5.4	15.1	34.2±9.2	34.4	**0.000**[m]
Urea, mg/dl	27.3±9.8	26.0	58.5±21.3	57.0	**0.000**[m]
Albumin, g/l	36.2±8.5	37.7	33.5±6.1	34.2	**0.000**[m]
BUN/creatinine ratio (%)					**0.000**χ^2
≤23.3	94.1		10.7		
>23.3	5.9		89.3		

t: Independent Samples Test; m: Mann-Whitney U Test; χ^2: Chi-Square Test; INR: International normalized ratio; BUN: Blood urea nitrogen; SD: Standard deviation.

When it comes to physical examination findings, patients with upper GI bleeding were found to have a significantly higher pulse rate and lower systolic blood pressure compared to those with lower GI bleeding (Table 1).

There was no statistically significant difference between the two groups in the use of aspirin, clopidogrel, nonsteroidal anti-inflammatory drugs, oral anticoagulants, or warfarin. But the usage of low molecular weight heparin was significantly higher in patients with lower GI bleeding (Table 2).

There were no statistically significant differences between the two groups concerning the rates of rebleeding, surgical intervention, ICU admission, or mortality. But the need for a red blood cell transfusion and the endoscopic intervention rate in the patients with upper GI bleeding were significantly higher (Table 2).

According to laboratory findings, patients with upper GI bleeding had significantly higher urea, BUN, and BUN/Creatinine ratio levels, while hemoglobin, hematocrit, and albumin levels were significantly lower compared to the ones with lower GI bleeding (Table 3).

In univariate regression analysis, hematemesis, melena, hematochezia, pulse rate, systolic blood pressure, hemoglobin, hematocrit, urea, BUN, BUN/Creatinine ratio, albumin levels, red blood cell transfusion requirement, and endoscopic intervention were found to be significant factors ($p<0.05$) for differentiating between upper and lower GI bleeding (Table 4).

In multivariate regression analysis, hematochezia, the BUN/Creatinine ratio, and the rate of endoscopic intervention were identified as significant and independent predictors ($p<0.05$) for distinguishing between upper and lower GI bleeding (Table 4).

The BUN/Creatinine ratio showed a significant ability to differentiate between upper and lower GI bleeding, with an area under the curve (AUC) of 0.960 (95% CI: 0.934–0.986). A cut-off value of 23.3 for the BUN/Creatinine ratio demonstrated significant discriminatory ability, with an AUC of 0.917 (95% CI: 0.879–0.955) (Table 5, Fig. 2).

At the cut-off value of 23.3, the BUN/Creatinine ratio had a sensitivity of 89.3%, specificity of 94.1%, positive predictive value of 97.5%, and negative predictive value of 77.7% for distinguishing between upper and lower GI bleeding (Table 5, Fig. 2).

Patients with a BUN/Creatinine ratio >23.3 had significantly higher rates of red blood cell transfusion, endoscopic intervention, and mortality compared to those with a BUN/creatinine ratio ≤23.3 ($p<0.05$) (Table 6).

Table 4. Logistic regression analysis for predicting the distinction between lower and upper GI bleeding

	Univariate model			Multivariate model		
	OR	95% CI	p	OR	95% CI	p
Hematemesis	6.942	3.308–14.568	**0.000**			
Melena	9.694	5.463–17.201	**0.000**			
Hematochezia	0.035	0.017–0.072	**0.000**	0.021	0.004–0.096	**0.000**
Pulse	1.032	1.013–1.052	**0.001**			
Systolic blood pressure	0.982	0.965–0.998	**0.027**			
Low molecular weight heparin (LMWH)	0.372	0.135–1.026	0.056			
Hemoglobin	0.798	0.710–0.896	**0.000**			
Hematocrit	0.917	0.880–0.956	**0.000**			
BUN	1.417	1.302–1.543	**0.000**			
BUN/creatinin ratio	1.432	1.309–1.566	**0.000**	1.483	1.311–1.678	**0.000**
Urea	1.171	1.127–1.216	**0.000**			
Albumin	0.934	0.892–0.978	**0.003**			
Red blood cell transfusion	4.514	2.642–7.711	**0.000**			
Endoscopic intervention	22.864	3.099–168.665	**0.002**	>100	2.406–>100	**0.016**

GI: Acute gastrointestinal; OR: Odds ratio; CI: Confidence interval; BUN: Blood urea nitrogen.

Table 5. ROC curve analysis of the BUN/creatinine ratio for differentiating between lower and upper GI bleeding

	Area under the curve		95% CI	p
BUN/creatinine ratio	0.960		0.934–0.986	**0.000**
BUN/creatinine 23.3 cut-off	0.917		0.879–0.955	**0.000**
	Lower gastrointestinal bleeding (n)	Upper gastrointestinal bleeding (n)		
BUN/creatinine ratio			Sensitivity	89.3
≤23.3	80	23	Positive predictive value	97.5
>23.3	5	192	Specificity	94.1

ROC: Receiver operating characteristic; BUN: Blood urea nitrogen; GI: Acute gastrointestinal; CI: Confidence interval.

DISCUSSION

Laboratory parameters and their use to differentiate between GI bleeding from the upper and lower tracts have been widely covered in the literature over the years.

In a study evaluating laboratory parameters for distinguishing upper from lower GI bleeding, red blood cells, hemoglobin, platelet count, BUN, and the BUN/Creatinine ratio were identified as significant markers [1]. In our study, when comparing laboratory parameters between patients with upper and lower GI bleeding, urea, BUN, and the BUN/Creatinine ratio were found to be significantly higher in patients with upper GI bleeding, whereas hemoglobin, hematocrit, and albumin levels were significantly lower. Furthermore, the significantly higher heart rate and lower systolic blood pressure observed in patients with upper GI bleeding support the notion that hemodynamic instability is more pronounced in these cases.

Table 6. Comparison of clinical outcomes based on BUN/creatinine ratio in patients with GI bleeding

	BUN/ creatinine ≤23.3 (n=103)	BUN/ creatinine >23.3 (n=197)	p
Red blood cell transfusion			**0.000**χ^2
No	59.2	17.8	
Yes	40.8	82.2	
Rebleeding			0.057χ^2
No	96.1	89.8	
Yes	3.9	10.2	
Endoscopic intervention			**0.002**χ^2
No	93.2	79.7	
Yes	6.8	20.3	
Surgical intervention			0.573χ^2
No	98.1	97.0	
Yes	1.9	3.0	
Intensive care unit hospitalization			0.059
No	97.1	91.4	
Yes	2.9	8.6	
Mortality			**0.011**χ^2
No	100.0	93.9	
Yes	0.0	6.1	

GI: Acute gastrointestinal; BUN: Blood urea nitrogen; χ^2: Chi-Square Test.

In a different study, by Wu et al., [2] the BUN/Creatinine ratio over 30 was discovered as being an independent risk factor for mortality in patients with upper GI bleeding. Another research by scientists Ziabari et al. [3] has empirically proven that a BUN/Creatinine ratio higher than 35 could predict GI bleeding in upper tract. Similarly, Ernst et al. [4] reported that a BUN/Creatinine ratio above 36 had high sensitivity for detecting upper GI bleeding. In our study, the cut-off value for the BUN/Creatinine ratio to distinguish upper from lower GI bleeding was determined to be 23.3 and patients with a BUN/Creatinine ratio >23.3 had significantly higher mortality rates compared to those with a ratio ≤23.3.

There is no standard cut-off value for the BUN/Creatinine ratio, as each study determines its threshold based on its patient population and clinical context. Therefore, cut-off values may vary across different studies.

Machlab et al. [5] found that the combination of blood detection in nasogastric tube aspirates and a high BUN/Creatinine ratio increased the likelihood of detecting upper GI bleeding, but both methods had low sensitivity individually.

It is important to consider the applicability of the BUN/Creatinine ratio to various populations. Several studies in children have highlighted the utility of the BUN/Creatinine ratio in localizing the source of GI bleeding and estimating its severity. Urashima et al. [6] reported the BUN/Creatinine ratio ≥30 is highly specific (98%) for upper GI bleeding in children, though sensitivity was moderate (68.8%). Another study [7] demonstrated that patients with gastroduodenal ulcers exhibited the highest ratios, underscoring the relevance of this marker in differentiating upper GI bleeding from lower GI bleeding. These results gain the importance of the BUN/Creatinine ratio in pediatric populations, especially in identifying causes of the upper GI bleeding like, peptic ulcer disease and varices. However, the study of Kim et al. [8] underscores the necessity of careful interpretation. The ratio BUN/Creatinine is, as a rule, greater in the upper gastrointestinal bleeding; however, since the mark with the lower gastrointestinal bleeding melena took place, the supervisors thought of it, and it may have some limitations, especially if pediatric patients with mixed bleeding presentations or co-morbidities are involved. Another study [9] observed the difference between the upper GI bleeding cases with and the ones without liver cirrhosis and BUN/Creatinine ratio being significantly lower in patients with liver cirrhosis. Nevertheless, a cutoff value of 30 led to a major overlap between the two groups, which indicated the limited utility of this parameter in differentiating between the cirrhotic and non-cirrhotic patients. Along the same line, Liu et al. [10] established the fact that a high BUN/Creatinine level was connected to the intervention requirement in acute upper GI bleeding. In our study, at the cut-off value of 23.3, patients with a BUN/creatinine ratio >23.3 had significantly higher red blood cell transfusion and endoscopic intervention rates, but no statistically significant difference was found for surgical intervention.

Feng et al. [11] highlighted the utility of a high BUN/Creatinine ratio in identifying the location of non-variceal upper GI bleeding and predicting clinical outcomes in its early stages. This study reported a high diagnostic accuracy of the BUN/Creatinine ratio (AUC = 0.831) for distinguishing upper GI bleeding from lower GI bleeding, with an optimal cut-off value of 34.59.

Other studies also investigated the clinical value of the BUN/Creatinine ratio as a diagnostic tool. Tomizawa et al. [12] established a BUN cut-off level of 21 mg/dL to differentiate upper from lower GI bleeding. Olsen and Andreassen [13] concluded that the BUN/Creatinine ratio could differantiate the upper and lower GI bleeding and the number of unnecessary endoscopies may be reduced if it is combined with clinical findings. Richards et al. [14] reported that a BUN/Creatinine ratio ≥36 indicated upper GI bleeding.

Lewis and Jacobson [15] reported that patients with a higher BUN/Creatinine ratio were more likely to have positive findings on delayed scintigraphic imaging using Tc-99m-labeled red blood cells for detecting GI bleeding, particularly when early scans were negative.

In our study, the BUN/Creatinine ratio proved to be a valuable marker for distinguishing GI bleeding locations in both adult populations and clinical settings.

Chalasani et al. [16] noted that the BUN/Creatinine ratio was higher in upper GI bleeding but had weaker predictive power in patients without hematemesis.

Other Findings

Prassler et al. [17] concluded that the urea/creatinine ratio alone was insufficient for distinguishing bleeding location and could lead to an increase in unnecessary colonoscopies.

Mortensen et al. [18] showed that the urea/creatinine ratio of 100 or more was able to distinguish upper GI bleeding.

Kumar et al. [19] concluded that a rise in BUN levels within 24 hours was associated with poor outcomes in acute non-variceal upper GI bleeding. This finding suggests that elevated BUN levels may indicate inadequate fluid resuscitation and are associated with higher risks of rebleeding, mortality, and the need for intervention.

Srygley et al. [20] reported the occurrence of a BUN/Creatinine ratio >30, melena, and bloody nasogastric lavage increased the likelihood of upper GI bleeding.

Var et al. [21] proclaimed that a BUN/Creatinine ratio >30 indicates upper GI bleeding as opposed to the ratio of <30, which cannot be used to determine the bleeding site.

These findings underscore the potential utility of the BUN/creatinine ratio in distinguishing upper GI bleeding from lower GI bleeding and predicting the need for intervention. Nevertheless, its clinical value must be interpreted alongside other clinical and laboratory parameters. The varying cutoff values, population differences, and methodological heterogeneity in the literature highlight the need for further studies to optimize the clinical application of this parameter.

The limitations of the study include its retrospective design and single-center nature, which may introduce biases and limit the generalizability of the findings. Using data from just one hospital might not show the full range of how patients are treated or how their conditions appear in different areas or healthcare systems. Also, because this study looks back at past data, it's harder to prove cause-and-effect relationships or account for other factors that could influence the results. For instance, groups like children or people with cirrhosis might have different diagnostic or treatment needs, which would need more specific research.

Conclusion

The BUN/creatinine ratio is a quick and inexpensive method to differentiate between the upper and lower parts of the gastrointestinal tract. Nevertheless, factors such as the patient's population, the place where bleeding is occurring, and also the condition of severity should be taken into account when it is used. Future large-scale, multicenter studies are necessary to validate these findings and standardize cut-off values for broader clinical applications. We consider that in the emergency settings where the site of bleeding is not identified the BUN/Creatinine ratio could be a very useful first guidance for localization.

Ethics Committee Approval: The Sisli Hamidiye Etfal Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (date: 17.09.2024, number: 4540).

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