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ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

Usefulness of Hemoglobin, Albumin, Lymphocyte and Platelet (HALP) Score in Determining the Need for Surgery in Ileus Patients in the Emergency Department

Acil Serviste İleus Hastalarında Ameliyat İhtiyacının Belirlenmesinde Hemoglobin, Albümin, Lenfositler, ve Trombosit (HALP) Skorunun Kullanılabilirliği

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ABSTRACT

Aim: To analyze the usefulness of HALP score (hemoglobin, albumin, lymphocyte and platelet) in determining the need for surgery in patients diagnosed with ileus in the emergency department.

Material and Method: Our study was designed retrospectively on patients diagnosed with ileus in the emergency department. HALP score was calculated from hemoglobin, albumin, lymphocyte and platelet values obtained from the patients within 24 hours. Patients were divided into two groups as operated and discharged with conservative treatment after hospitalization in the general surgery clinic. The differences in HALP score between the two groups were analyzed.

Results: The study included 213 patients diagnosed with ileus in the emergency department. The mean age of the patients was 60 ±13 years and 121 (56.8%) were male. The number of patients discharged by general surgery with conservative treatment was 168 (78.9%) and 45 (21.1%) were operated on. It was found to be significant that patients discharged with conservative treatment had a higher HALP score than patients who underwent surgery (p=0.007). In the study, diagnostic test performances of HALP score were calculated in patients who were discharged with conservative treatment and those who underwent surgery. Accordingly, it was determined that HALP score >0.369 predicted that there was no need for surgery.

Conclusion: Calculation of HALP score in patients diagnosed with ileus in the emergency department may be useful in predicting the need for surgery in patients.

Keywords: Emergency department, ileus, HALP score

ÖZ

Amaç: Acil serviste İleus tanısı konulan hastalarda ameliyat ihtiyacının belirlenmesinde HALP skorunun (hemoglobin, albümin, lenfosit ve trombosit) kullanılabilirliğini araştırmak.

Gereç ve Yöntem: Çalışmamız acil serviste ileus tanısı konulan hastalar üzerinde retrospektif olarak tasarlandı. Hastalardan 24 saat içerisinde alınan hemoglobin, albümin, lenfosit ve trombosit değerlerinden HALP skoru hesaplandı. Hastalar genel cerrahi servisine yatışından sonra ameliyata alınan ve konservatif tedavi ile taburcu edilen olarak iki guruba ayırıldı. HALP skorunun iki gruba göre farklılığına bakıldı.

Bulgular: Çalışmaya acil serviste ileus tanısı konulan 213 hasta dahil edildi. Hastaların yaş ortalamaları 60,9±13,2 yıl ve 121 (% 56,8)'i erkek idi. Genel cerrahi tarafından konservatif tedavi ile taburcu edilen hasta sayısı 168 (% 78,9), ameliyata alınan hasta sayısının ise 45 (% 21,1) olduğu saptandı. Konservatif tedavi ile taburcu edilen hastaların acil ameliyata alınan hastalara göre HALP skorunun daha yüksek olması anlamlı bulundu (p=0,007). Çalışmada konservatif tedavi ile taburcu edilen ve ameliyata alınanlarda HALP skorunun tanısal test performansları hesaplandı. Buna göre HALP skorunun >0,369 üstünde ameliyat ihtiyacının olmadığını öngördüğü tespit edildi.

Sonuç: Acil serviste ileus tanısı konulan hastalarda HALP skorunun hesaplanması hastalarda ameliyat gerekliliğini tahmin etmede faydalı olabilir.

Anahtar Kelimeler: Acil servis, ileus, HALP skoru

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INTRODUCTION

Gastrointestinal obstruction occurs when the normal flow of swallowed contents is interrupted. This interruption can occur anywhere along the gastrointestinal tract. When it occurs in the upper gastrointestinal tract, such as the esophagus, stomach or duodenum, it tends to have a less urgent nature, while in the small intestine and colon it often presents as a medical emergency. Intestinal obstruction accounts for approximately 15 percent of all emergency department admissions for acute abdominal pain (1). The passage of intestinal contents may be partially (subileus) or completely (complete ileus) blocked. Mechanical ileus affects the small intestine more frequently than the large intestine (4:1 ratio). Small bowel ileus is usually caused by adhesions from previous surgery (65%) or hernia (15%), whereas large bowel ileus is usually caused by adhesions and strictures (up to 10%) after cancer (70%) or recurrent diverticulitis. Less common causes of large bowel ileus include sigmoid volvulus (5%) and hernia (2.5%) (2). Mechanical ileus requiring surgery is a common complication after previous operations (3). There is no specific laboratory test for the evaluation of mechanical ileus associated with intestinal ischemia (4,5). After completion of initial treatment and diagnostic evaluation in the emergency department, it should be determined whether the patient should be operated immediately or conservative treatment should be attempted. There is no definite recommendation for the duration of conservative treatment; the historical saying "Never let the sun rise or set on a case of intestinal obstruction" is no longer universally applicable (6). Conservative treatment can be continued for even a few days under close clinical and laboratory observation. However, it should be kept in mind that an unsuccessful attempt of conservative treatment for more than three days is associated with a greater need for bowel resection (12% vs. 29%) and higher morbidity and mortality (level IV evidence) (4 , 6 , 7). The decision whether to operate or not is not always easy, even for experienced surgeons (8). While small bowel ileus is usually due to adhesions (Figure 1b) and about three quarters of cases can be managed conservatively, colonic ileus is usually due to cancer and three quarters of cases require emergency surgery (7). Hematologic parameters, including albumin and hemoglobin levels and lymphocyte counts, are low-cost tests that can be used to determine inflammation and nutritional status. HALP (Hemoglobin, Albumin, Lymphocytes and Platelets) score may be a useful parameter in differentiating malignant and benign causes of acute mechanical intestinal obstruction (9). In our study, we aimed to determine the predictability of HALP score in determining the need for surgery in patients admitted to the emergency department and diagnosed with ileus. Thus, we investigated whether it could be useful in differentiating patients who may benefit from conservative treatment.

MATERIAL AND METHOD

This study was conducted retrospectively at Balıkesir University Hospital. The study was carried out with the permission of Balıkesir University Hospital Ethics Committee (Date: September 20, 2023; Number: 2023/130). Patients diagnosed with ileus in the emergency department between January 2019 and September 2023 were retrospectively reviewed from hospital records. Patients under 18 years of age, patients who refused to be treated in the hospital, and patients with missing laboratory data were excluded from the study. The diagnosis of ileus was made by the on-call emergency specialist and confirmed by a general surgeon. Hemoglobin, albumin, lymphocyte and platelet values at admission were recorded. Blood counts and biochemical parameters were tested using an automated analyzer (Beckman Coulter Hematology Analyzer LH780, Beckman Coulter Chemistry Analyzer AU680). The HALP score was then calculated with these values. The HALP score was calculated using the hemoglobin (g/L) x albumin (g/L) x lymphocyte count (/L) / platelet count (/L) method. Patients were divided into two groups as operated and conservatively treated.

SPSS (Statistical Package for the Social Sciences) 25.0 package program was used for statistical analysis of the data. Categorical measurements were summarized as number and percentage, and continuous measurements were summarized as mean and standard deviation (median and minimum-maximum where necessary). Chi-square test was used for comparisons of categorical expressions. Shapiro-Wilk test was used to determine whether the parameters in the study showed normal distribution. Mann whitney u test was used for parameters that did not show normal distribution. The sensitivity and specificity values of the HALP score were calculated based on the hospitalization duration groups of the patients in the study, and the cut off value was determined by examining the area under the ROC curve. Statistical significance level was taken as 0.05 in all tests.

RESULTS

The study included 213 patients diagnosed with ileus. The mean age of the patients was 60±13 years and 121 (56.8%) were male. The mean number of days of hospitalization was 4.7±5.0. The number of patients treated conservatively by general surgery was 168 (78.9%) and 45 (21.1%) were operated on (**Table 1**).

It was found to be significant that the HALP score was higher in patients who received conservative treatment than in patients who underwent surgery (p=0.007). No significant difference was observed between the groups with the other parameters in **Table 2** (p>0.05)

Table 1. Comparison of the characteristics of patients diagnosed with ileus

	n	%
Gender		
Man	121	56.8
Women	92	43.2
Outcome		
Conservative treatment	168	78.9
Operated	45	21.1
	Mn±Sd	**Med (Min-Maks)**
Age	60±13	62 (18-90)
Hospitalization time	4.76±5.0	4 (0-43)
Albumin	15.7±12.8	15.7 (2.6-41)
Hemoglobin	11.6±1.4	11.6 (7.9-15.1)
Platelet	271±91	271 (54-639)
Lymphocyte	1.45±2.9	1.45 (0.1-42.2)
Halp	0.92±1.0	0.49 (0.02-7.89)

Table 2. Comparison of patients with conservative treatment and surgery

	Conservative treatment (n=168)	Operated (n=45)	p
	n(%)	n(%)	
Gender			
Man	96 (57.1)	25 (55.6)	0.849†
Woman	72 (42.9)	20 (44.4)	
	Mn±Sd	**Mn ±Sd**	**p**
Age	64.4±2.1	62.2±1.7	0.573‡
Albumin	20.3±2.7	16.1±1.9	0.204‡
Hemoglobin	11.5±0.2	11.8±0.1	0.288‡
Platelet	293.4±21.0	272.8±10.2	0.589‡
lymphocyte	2.65±.4	1.37±0.08	0.658‡
HALP	1.37±0.1	0.95±0.1	0.007**.‡

#Data given as mean ± standard deviation‡: Mann Whitney U, Data given as n (%); Pearson Chi-square †, p<0,05, Mn:mean,Sd: standard deviation

The diagnostic test performances of the HALP score in patients who received conservative treatment and those who underwent surgery are shown in Table 3. Accordingly, it was determined that HALP score >0.369 with a sensitivity of 81.55% and a specificity of 48.89% predicted patients who received conservative treatment (p=0.014) (**Table 3**; **Figure 1**).

Table 3. Diagnostic test performance of HALP score in patients receiving conservative treatment

	HALP
AUC 95%-CI (%)	0.630 (0.561-0.695)
Cut-off	>0.369
Sensitive (%) 95%-CI (%)	81.55 (74.8-87.1)
Spesitive 95%-CI (%)	48.89 (31.7-62.1)
PPV 95%-CI (%)	85.6 (81.6-88.9)
NPV 95%-CI (%)	41.5 (31.4-52.3)
p	0.014*

* p<0,05, **p<0,001, Roc curve test, AUC: Area under the curve , CI: Confidence interval, PPV: positive predictive value, NPV: negative predictive value

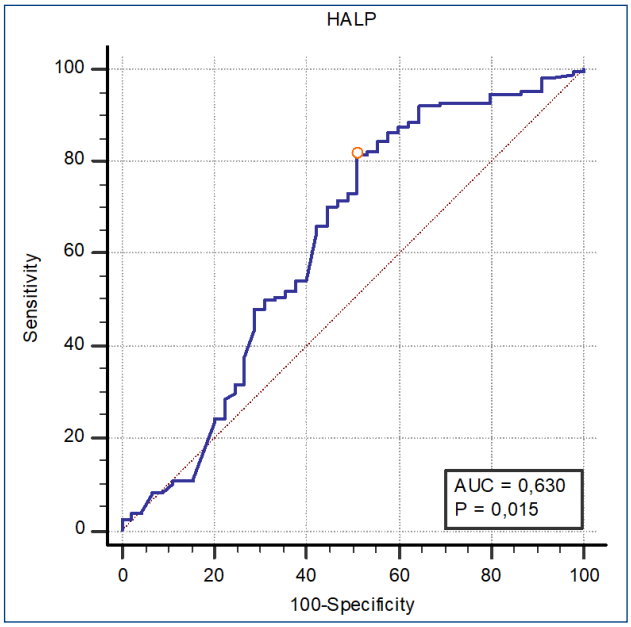

Figure 1. Diagnostic test performance of HALP score with ROC Curve test

DISCUSSION

Since the cause of mechanical ileus is mechanical, the only causal treatment option is to surgically remove the transitional barrier. According to the pathophysiologic principles presented, urgent surgery is indicated in the presence of strangulation ileus (10). If complete mechanical ileus and high small bowel ileus are present, surgery should also be performed urgently. Only in the case of deep (chronic) ileus, for example caused by colon cancer, the operation can be postponed, but the patient can then benefit from a one-stage procedure (11). However, this is only possible in the absence of decompensated intestinal ileus with small bowel obstruction and thus incipient ileus disease. The time factor is crucial for prognosis, as the mortality rate increases significantly as the duration of ileus symptoms increases. It should be noted that ileus disease is essentially a surgical condition that usually requires surgical treatment. Accordingly, conservative treatment under intensive medical follow-up and evaluation of the patient should only be considered as an accompanying measure. Purely conservative treatment is reserved for individual cases and defined forms of ileus without ileus disease, but even a purely conservative approach requires the supervision of an experienced surgeon. Otherwise, there is no guarantee that the appropriate time will not be missed if an operation is required to prevent a life-threatening operation. The time factor is very important for prognosis because of the duration of ileus symptoms(12). The HALP score is a newly defined, valuable index that indicates the patient's systemic inflammation and nutritional status. In this index, the general well-being of the patient is evaluated according to hemoglobin, albumin, lymphocyte and platelet values. High HALP score is associated with

longer survival (13-15). Anemia is a common condition in intensive care unit patients. The relationship between low hemoglobin levels and poor quality of life has been shown in randomized controlled studies (16). Serum albumin has frequently been used to assess nutritional status and visceral protein synthesis. Lymphocytes play an important role in inflammation. Excessive platelet and hyperactivity may lead to thromboembolism and atherosclerotic lesions. The HALP score, which is used to evaluate all these factors together, can give us important information about the patient's prognosis. Peng et al. showed a significant correlation between HALP score and survival in patients with bladder cancer (17). Feng et al. reported that HALP score is an independent prognostic index in patients with esophageal cancer (18). Tian et al. showed that HALP score was associated with 90-day and 1-year mortality in patients with stroke (14). Xu et al. reported that HALP score is a good predictor of postoperative survival and recurrence in patients with pancreatic cancer (15). Kocaoğlu et al. found that HALP score was not an effective parameter in predicting prognosis in intensive care unit patients and acute heart failure patients (19,20). In our study, HALP score gave significant results in terms of making the decision for surgery in ileus patients. While albumin, Hgb, Plt and lymphocyte values alone did not show a significant correlation, HALP score showed a significant correlation in differentiating patients receiving conservative treatment.

CONCLUSION

The HALP score is a practical score that can be obtained from parameters that are easy to use and can be checked quickly in the emergency department. Prediction of the need for surgical operation in patients with ileus is important for patient management. HALP score may be useful in predicting the need for surgical operation.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Balıkesir University Hospital Ethics Committee (Date: September 20, 2023; Number: 2023/130).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

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