

Predictive value of the HALP score in differentiating complicated and uncomplicated acute appendicitis

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ABSTRACT

BACKGROUND: Acute appendicitis is one of the most common causes of emergency abdominal surgery, and early identification of complicated cases is critical for effective clinical management. Although classical inflammatory markers such as white blood cell count (WBC), C-reactive protein (CRP), and immature granulocyte percentage (IG%) are commonly used in diagnosis, their predictive accuracy remains limited. The HALP score (hemoglobin, albumin, lymphocyte, and platelet score), which incorporates hemoglobin, albumin, lymphocyte, and platelet levels, may offer a more comprehensive assessment by reflecting both inflammatory and immuno-nutritional status.

METHODS: This retrospective study included 854 patients who underwent appendectomy between January 2022 and December 2023 at a tertiary care center. Based on surgical and pathological findings, patients were categorized into two groups: complicated and uncomplicated appendicitis. Demographic data, along with hemoglobin, albumin, lymphocyte, platelet, WBC, CRP, and IG% values, were recorded. The diagnostic performance of these parameters was statistically evaluated.

RESULTS: Among the 854 patients, 112 (13.1%) were diagnosed with complicated appendicitis. Complicated cases showed a significantly higher median age and a predominance of female patients. CRP, WBC, IG%, and platelet levels were significantly elevated in the complicated group, while hemoglobin, albumin, and lymphocyte counts were lower. The HALP score was significantly lower in patients with complicated appendicitis compared to those with uncomplicated appendicitis (median: 32.8 vs. 53.4, $p < 0.001$). Among the evaluated markers, the HALP score demonstrated the highest diagnostic performance (area under the curve [AUC]: 0.732), followed by CRP (AUC: 0.706), IG% (AUC: 0.645), and WBC (AUC: 0.574).

CONCLUSION: The HALP score is a valuable and easily applicable biomarker for predicting complicated acute appendicitis. It outperforms traditional inflammatory markers by incorporating parameters that reflect both systemic inflammation and immuno-nutritional status. Routine use of the HALP score in emergency surgical evaluations may facilitate early identification of high-risk patients and guide clinical decision-making. Prospective, multicenter studies are needed to further validate its clinical utility.

Keywords: HALP score (hemoglobin, albumin, lymphocyte, and platelet score); complicated appendicitis; biomarker.

INTRODUCTION

Acute appendicitis is one of the most common causes of emergency abdominal surgery worldwide and carries a high

lifetime risk.^[1] If not diagnosed in a timely manner, the risk of complications increases, leading to higher morbidity, prolonged hospital stays, and a loss of workforce productivity. As

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a result, hospital costs and overall health expenditures rise. Therefore, not only early diagnosis but also accurate prediction of complications, which can influence the clinical course of the disease, is of critical importance.^[2]

Although clinical scoring systems such as the Alvarado score and the Appendicitis Inflammatory Response (AIR) score contribute to the diagnostic process, they have limited sensitivity in predicting disease severity, particularly in identifying complicated appendicitis.^[3,4] Currently, clinical evaluation, laboratory tests, and imaging methods are used in combination to manage patients with suspected appendicitis. While classical inflammatory markers such as white blood cell count (WBC), C-reactive protein (CRP), and immature granulocyte percentage (IG%) are commonly used to predict complications, their diagnostic accuracy remains limited, and the search for new biomarkers continues.^[5]

In recent years, biomarkers that reflect both systemic inflammation and nutritional status have been shown to be effective in determining the prognosis of various diseases.^[6,7] The HALP score (Hemoglobin \times Albumin \times Lymphocyte / Platelet) has emerged as a novel parameter developed in this context. It has demonstrated prognostic value, particularly in oncologic patient populations, and is based on cost-free and routinely available laboratory data.^[1,8] By reflecting not only inflammatory activity but also immunonutritional status, the HALP score has the potential to serve as a prognostic tool in different clinical scenarios, including infectious, inflammatory, and metabolic diseases. In this context, studies have reported the HALP score as a significant predictive biomarker in cases of complicated diverticulitis.^[9]

However, the role of the HALP score in acute inflammatory surgical conditions has not yet been clearly defined in the literature. This study aims to evaluate the diagnostic value of the HALP score in predicting the development of complicated appendicitis and to compare its performance with that of classical inflammatory markers.

MATERIALS AND METHODS

This retrospective, single-center study was conducted between January 1, 2022 and December 31, 2023 at a tertiary care training and research hospital. The study was designed and carried out in accordance with the ethical principles outlined in the Declaration of Helsinki, and ethical approval was obtained from UHS Ankara Training and Research Hospital Ethics Committee (Ethics Committee Approval No: E-25-384, Date: 05.02.2025).

Of the 901 adult patients initially assessed, 47 were excluded based on predefined exclusion criteria. The remaining 854 patients were included in the final analysis. Inclusion criteria consisted of patients with a confirmed diagnosis of acute appendicitis based on physical examination, laboratory tests, imaging (ultrasonography and/or abdominal computed to-

mography), and histopathological evaluation, all of whom underwent surgical treatment.

Based on operative findings and pathology reports, patients were divided into two groups: uncomplicated appendicitis (phlegmonous) and complicated appendicitis (gangrenous, perforated, and/or periappendicular abscess). Patients for whom this distinction could not be clearly made were excluded. Additional exclusion criteria included a history of pregnancy, peripheral vascular disease, heart failure, hematologic disorders, chronic liver disease, use of anticoagulants, antibiotics, or steroids, the presence of other acute or chronic infections, appendiceal tumors, negative appendectomy, and incomplete or inadequate medical records.

Laboratory values obtained at initial hospital admission included hemoglobin (g/dL), white blood cell (WBC, /mm³), immature granulocyte percentage, lymphocyte count (/mm³), platelet count ($\times 10^3$ /mm³), albumin (g/L), and C-reactive protein (mg/L). The HALP score was calculated using the formula: Hemoglobin \times Albumin \times Lymphocyte / Platelet. Demographic data, including age (years) and gender (%), were also recorded.

These parameters were compared between the uncomplicated and complicated appendicitis groups. The diagnostic performance of the HALP score, CRP, WBC, IG%, hemoglobin, lymphocyte count, albumin, and platelet levels were statistically analyzed.

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as medians (minimum-maximum), and comparisons between the two groups were made using the Mann-Whitney U test. Categorical data were expressed as numbers and percentages, and the chi-square test was used to assess differences between groups.

ROC (Receiver Operating Characteristic) analysis was performed to evaluate the diagnostic performance of biomarkers in predicting complicated appendicitis. The area under the curve (AUC) for each parameter was reported along with 95% confidence intervals. The optimal cut-off value was determined using the Youden index. The level of statistical significance was set at $p < 0.05$.

RESULTS

Of the 854 patients included in the study, 742 (86.9%) had uncomplicated appendicitis and 112 (13.1%) had complicated appendicitis. The median age of patients with complicated appendicitis was 43 years, which was significantly higher than that of the uncomplicated group (33 years; $p < 0.001$). The rate of complicated appendicitis was also higher among female patients compared to males ($p < 0.001$). In terms of laboratory

Table 1. Comparison of demographic and laboratory characteristics between groups

| | Uncomplicated Appendicitis (n=742) | Complicated Appendicitis (n=112) | p value |
|--|---------------------------------------|-------------------------------------|---------|
| Sex, n (%) | | | |
| Female | 280 (37.7%) | 62 (55.4%) | <0.001 |
| Male | 462 (62.3%) | 50 (44.6%) | |
| Age, years | 33 (25-45) | 43 (29-62) | <0.001 |
| Hemoglobin, g/dL | 14.8 (13.4-15.9) | 13.1 (12.0-14.9) | <0.001 |
| White Blood Cell Count, mm ³ | 13,075 (10,585-16,193) | 14,475 (11,343-17,395) | 0.011 |
| Lymphocyte Count, mm ³ | 2,030 (1,440-2,760) | 1,760 (1,323-2,358) | 0.008 |
| Platelet Count, 10 ³ /mm ³ | 255 (216-298) | 306 (263-373) | <0.001 |
| Albumin, g/L | 47 (44-49) | 44 (40-46) | <0.001 |
| IG% | 0.5 (0.3-0.6) | 0.6 (0.4-0.8) | <0.001 |
| C-Reactive Protein, mg/L | 13.0 (6.0-32.2) | 44.0 (12.7-107.5) | <0.001 |
| HALP Score | 53.4 (36.7-74.7) | 32.8 (21.7-46.2) | <0.001 |

HALP: Hemoglobin × Albumin × Lymphocyte / Platelet; n: Number; IG%: Immature Granulocyte Percentage; g: Gram; dL: Deciliter; mm³: Cubic Millimeter; L: Liter; mg: Milligram.

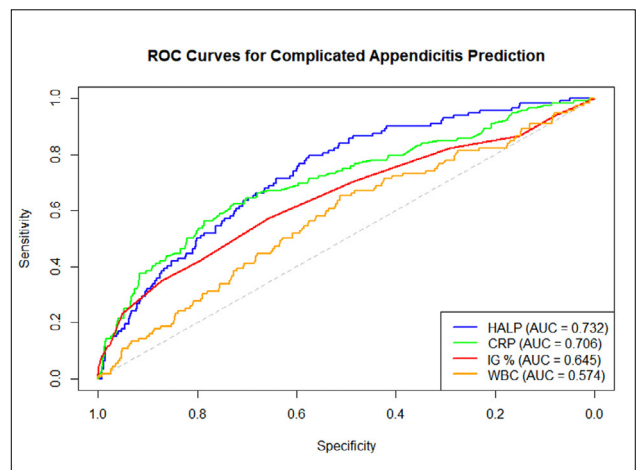
Table 2. Diagnostic performance of laboratory parameters in predicting complicated appendicitis based on receiver operating characteristic (ROC) analysis

| | AUC (95% CI) | Cut-Off | Sensitivity % (95% CI) | Specificity % (95% CI) | p value |
|---|---------------------|---------|------------------------|------------------------|---------|
| HALP Score | 0.732 (0.701-0.762) | ≤47.7 | 79.46% (70.8-86.5) | 57.55% (53.9-61.1) | <0.001 |
| C-Reactive Protein, mg/L | 0.706 (0.674-0.736) | >30.9 | 62.5% (52.9-71.5) | 72.78% (69.4-76.0) | <0.001 |
| IG% | 0.645 (0.612-0.677) | >0.5 | 57.14% (47.4-66.5) | 65.77% (62.2-69.2) | <0.001 |
| White Blood Cell Count, mm ³ | 0.574 (0.540-0.608) | >13,160 | 65.18% (55.6-73.9) | 51.21% (47.6-54.9) | 0.012 |

HALP: Hemoglobin × Albumin × Lymphocyte / Platelet; n: Number; IG%: Immature Granulocyte Percentage; mm³: Cubic Millimeter; L: Liter; mg: Milligram; CI: Confidence Interval; AUC: Area Under the Curve; ROC: Receiver Operating Characteristic.

parameters, the complicated group had a significantly lower hemoglobin level (13.1 g/dL; $p<0.001$), lymphocyte count (1,760 /mm³; $p=0.008$), and albumin level (44 g/L; $p<0.001$). Conversely, the WBC count was higher in the complicated group (14,475 /mm³; $p=0.011$). Platelet count was also elevated in this group (306 ×10³/mm³; $p<0.001$). Regarding inflammatory markers, IG% was 0.6 and CRP level was 44.0 mg/L in the complicated group; both parameters were significantly higher than in the uncomplicated group ($p<0.001$). The HALP score was significantly lower in patients with complicated appendicitis, with a median value of 32.8 compared to 53.4 in the uncomplicated group ($p<0.001$) (Table 1).

The diagnostic performance of biomarkers in predicting complicated appendicitis was evaluated using ROC analysis. The HALP score demonstrated the highest AUC value (AUC: 0.732). The cut-off point for the HALP score was ≤47.7, with a sensitivity of 79.46% and a specificity of 57.55%. For CRP, a cut-off value of >30.9 mg/L yielded an AUC of 0.706, with 62.50% sensitivity and 72.78% specificity. At a threshold of

**Figure 1.** Receiver operating characteristic (ROC) curves of the HALP score (hemoglobin, albumin, lymphocyte, and platelet score), C-reactive protein (CRP), white blood cell (WBC) count, and immature granulocyte percentage (IG%) for predicting complicated appendicitis.

>0.5 for IG%, the AUC was 0.645, sensitivity 57.14%, and specificity 65.77%. The WBC cut-off value of $>13,160/\text{mm}^3$ resulted in an AUC of 0.574, with sensitivity and specificity of 65.18% and 51.21%, respectively (Table 2, Fig. 1).

DISCUSSION

In this study, 854 adult patients with acute appendicitis were retrospectively evaluated, of whom 13.1% ($n=112$) were classified as having complicated appendicitis. Although males outnumbered females in the overall cohort, the proportion of female patients was notably higher in the complicated group (55.4%). The finding that the median age was higher in complicated cases has also been reported in previous studies, and it has been suggested that age may play a role in the development of complications.^[4] There is no clear consensus in the literature regarding gender distribution: while some studies have reported a male predominance in complicated cases,^[4] our series showed a notable female predominance. This suggests that the influence of demographic characteristics on clinical outcomes may be heterogeneous.

In the current literature, the diagnostic accuracy of classical inflammatory markers (CRP, WBC, IG%, etc.) in predicting complications remains limited.^[5] The HALP score (Hemoglobin \times Albumin \times Lymphocyte / Platelet) offers a more comprehensive assessment, as it reflects both immunonutritional status and systemic inflammation. It has been proposed as an alternative parameter for identifying complicated cases. The HALP score, whose prognostic role has been demonstrated in various clinical settings, particularly in oncology, has recently attracted attention in studies involving infectious and inflammatory surgical conditions.^[1,8,9] In our study, the predictive value of the HALP score in acute appendicitis was evaluated and compared with traditional biomarkers.

C-reactive protein, widely used in clinical practice, is a key marker of the acute inflammatory response. Elevated CRP levels in acute appendicitis are often associated with more complicated presentations. The success of CRP in making this distinction has been evaluated in many studies, with some studies reporting high specificity rates. Moon HM et al.^[10] reported a sensitivity of 57.6% and a specificity of 98.3% at a CRP cut-off value of 7.05 mg/dL, highlighting its notably high specificity. Panagiotopoulou IG et al.^[11] found CRP to be a more powerful diagnostic tool for predicting complications compared to other classical markers. Similarly, Eddama M et al.^[12] emphasized the predictive value of CRP in a logistic regression model that included it as a key variable. In our study, CRP levels were significantly higher in the complicated appendicitis group. The ROC analysis yielded an AUC of 0.706, with a sensitivity of 62.5% and specificity of 72.78%. These findings support CRP as a valuable biomarker in predicting complications.

White blood cell count is frequently used in the diagnosis of acute appendicitis as a classic and widely accepted biomarker

of inflammation. In the literature, WBC levels are often reported to be significantly elevated, particularly in complicated appendicitis cases. McGowan DR et al.^[13] demonstrated that WBC is an important marker in diagnosing complicated appendicitis and that high WBC levels are associated with an increased risk of perforation. However, the specificity of WBC is limited, as elevated levels can also occur in other inflammatory conditions, reducing its diagnostic accuracy. In our study, WBC levels were significantly higher in the complicated group; however, the AUC value from the ROC analysis indicated limited diagnostic performance (AUC: 0.574). These findings suggest that WBC plays a limited but complementary role in predicting complications of acute appendicitis.

Platelet count is one of the key hematologic parameters involved in inflammatory processes; however, there are conflicting findings in the literature regarding its diagnostic value in predicting complications of acute appendicitis. Sevinç MM et al.^[14] investigated the association between platelet count and platelet volume with complicated appendicitis but concluded that platelet count alone was not a significant predictor. Similarly, Atas et al.^[15] examined the relationship between platelet count and the development of complicated appendicitis and also found no significant difference. In our study, the platelet count was higher in the complicated appendicitis group. These data suggest that platelet count is a supportive but not sufficient parameter for predicting complications.

In the literature, the use of lymphocyte count alone as a predictive marker for complications is also limited. Atas H et al.^[15] reported that lymphocyte count alone was not a significant indicator for predicting complications, and that ratios such as the neutrophil-to-lymphocyte ratio (NLR) offered higher predictive value. In our study, lymphocyte count was found to be significantly lower in the complicated appendicitis group. Nevertheless, its inclusion in the HALP score enhances its clinical value when considered alongside other parameters.

Immature granulocyte percentage is one of the early markers of inflammation in the diagnosis of acute complicated appendicitis and has received increasing attention in recent years. Unal et al.^[16] demonstrated that IG% had superior diagnostic performance in identifying complicated appendicitis compared to classical inflammatory markers and was both a sensitive and specific parameter for predicting the development of complications. Similarly, Altiner S et al.^[17] reported that IG% was significantly elevated in complicated appendicitis cases and serves as a reliable marker reflecting the severity of inflammation. In our study, IG% was also found to be significantly elevated in the complicated appendicitis group and demonstrated good diagnostic performance (AUC: 0.645) in ROC analysis. The fact that IG% can be easily measured through routine complete blood count, along with its cost-effectiveness, provides a practical advantage in the early identification of high-risk patients in clinical practice. In this context, IG% is considered a reliable and useful biomarker for diagnosing complicated appendicitis, and its inclusion in

routine evaluations would be beneficial.

Although inflammatory markers such as the percentage of immature granulocytes play an important role in the early prediction of complications, more comprehensive scoring systems that assess both immune response and nutritional status have been developed in recent years. In this context, the HALP score (Hemoglobin \times Albumin \times Lymphocyte / Platelet), which reflects both systemic inflammation and immune-nutritional status, has emerged as a promising parameter for the diagnosis of complicated appendicitis. Saridas et al.^[1] reported that the HALP score demonstrated high diagnostic performance in identifying complicated appendicitis, while Benli S et al.^[8] showed that low HALP scores were strongly associated with complications such as periapudicular abscess, perforation, and gangrenous appendicitis, making it a valuable tool for predicting such outcomes. Other studies have also confirmed that the HALP score more effectively reflects disease severity and prognosis by integrating markers of systemic inflammation and immune-nutritional status.^[9,18-21] For example, Güler I et al.^[22] concluded that the HALP score was effective in predicting short-term mortality in patients with acute pancreatitis. In our study, the HALP score outperformed classical markers (CRP, WBC, IG%) in predicting complications, achieving the highest AUC value (0.732) in ROC analysis. This finding supports the potential use of the HALP score as an easily applicable, low-cost, and comprehensive marker in clinical practice.

This study has some limitations. First, due to its retrospective design, data were obtained from patient records, and full access to some clinical and laboratory variables was not possible. Additionally, as the study was conducted in a single center, the generalizability of the findings to broader populations may be limited. There are no prospective data to monitor the dynamic changes of the evaluated biomarkers, particularly the HALP score, over time. Additionally, while the definition of complications was based on surgical and pathological findings, long-term clinical follow-up data were not included in this study.

The results of our study demonstrate that the HALP score is a more effective parameter for diagnosing complicated appendicitis, as it reflects not only inflammation but also the patient's immune-nutritional status. This provides a significant advantage, particularly for early diagnosis and appropriate clinical management. Moreover, the ability to calculate the HALP score using data from routine biochemistry and hemogram tests offers a significant advantage in clinical practice, both in terms of ease of application and cost-effectiveness.

CONCLUSION

In conclusion, the HALP score is recommended as an early and reliable biomarker for the diagnosis of complicated acute appendicitis. Its superior performance compared to classical inflammatory markers in predicting complication risk sug-

gests that it may be a useful tool for guiding clinical decision-making. However, large-scale, prospective, and multicenter studies, particularly those involving diverse patient populations, are necessary to increase the validity of our findings.

Ethics Committee Approval: This study was approved by the UHS Ankara Training and Research Hospital Ethics Committee (Date: 05.02.2025, Decision No: E-25-384).

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REFERENCES

1. Saridas A, Vural N, Duyan M, Guven HC, Ertas E, Cander B. Comparison of the ability of newly inflammatory markers to predict complicated appendicitis. *Open Med* 2024;19:20241002. [CrossRef]
2. Hajibandeh S, Hajibandeh S, Hobbs N, Mansour M. Neutrophil-to-lymphocyte ratio predicts acute appendicitis and distinguishes between complicated and uncomplicated appendicitis: A systematic review and meta-analysis. *Am J Surg* 2020;219:154-63. [CrossRef]
3. Rodriguez-Garcia FA, Rodríguez-Sánchez CE, Naranjo-Chávez JC, Torres-Ortiz-Ocampo CJ, Rojas-Larios F, Covarrubias-Ramírez K, et al. Assessment of negative appendectomy in acute appendicitis diagnoses. *Surg Pract Sci* 2025;21:100281. [CrossRef]
4. Haak F, Kollmar O, Ioannidis A, Slotta JE, Ghadimi MB, Glass T, et al. Predicting complicated appendicitis based on clinical findings: The role of Alvarado and Appendicitis Inflammatory Response scores. *Langenbecks Arch Surg* 2022;407:2051-7. [CrossRef]
5. Shuaib A, Alhamdan N, Arian H, Sallam MA, Shuaib A. Hyperbilirubinemia and hyponatremia as predictors of complicated appendicitis. *Med Sci* 2022;10:36. [CrossRef]
6. Andersson RE, Stark J. Diagnostic value of the appendicitis inflammatory response (AIR) score. A systematic review and meta-analysis. *World J Emerg Surg* 2025;20:12. [CrossRef]
7. Andersson M, Kolodziej B, Andersson RE; STRAPPScore Study Group. Randomized clinical trial of Appendicitis Inflammatory Response score-based management of patients with suspected appendicitis. *Br J Surg* 2017;104:1451-61.
8. Benli S, Tazeoğlu D. The efficacy of hemoglobin, albumin, lymphocytes, and platelets (HALP) score in signifying acute appendicitis severity and postoperative outcomes. *Updates Surg* 2023;75:1197-202. [CrossRef]
9. Barlas AM, Altın S, Başpınar A, Aydın SM, Doğanay E, Kaymak Ş, et al. Predicting complicated acute diverticulitis with the HALP score: A retrospective study. *Asian J Surg* 2025;48:287-91. [CrossRef]
10. Moon HM, Park BS, Moon DJ. Diagnostic value of C-reactive protein in complicated appendicitis. *J Korean Soc Coloproctol* 2011;27:122-6. [CrossRef]
11. Panagiotopoulou IG, Parashar D, Lin R, Antonowicz S, Wells AD, Bajwa FM, et al. The diagnostic value of white cell count, C-reactive protein and bilirubin in acute appendicitis and its complications. *Ann R Coll Surg Engl* 2013;95:215-21. [CrossRef]
12. Eddama M, Fragkos KC, Renshaw S, Aldridge M, Bough G, Bonthala L, et al. Logistic regression model to predict acute uncomplicated and complicated appendicitis. *Ann R Coll Surg Engl* 2019;101:107-18. [CrossRef]

13. McGowan DR, Sims HM, Zia K, Uheba M, Shaikh IA. The value of biochemical markers in predicting a perforation in acute appendicitis. *ANZ J Surg* 2013;83:79-83. [CrossRef]
14. Sevinç MM, Kınacı E, Çakar E, Bayrak S, Özakay A, Aren A, et al. Diagnostic value of basic laboratory parameters for simple and perforated acute appendicitis: An analysis of 3392 cases. *Ulus Travma Acil Cerrahi Derg* 2016;22:155-62. [CrossRef]
15. Ataş H, Kılıç MÖ, Terzioğlu SG, Saylam B. Role of hematological parameters in prediction of complicated appendicitis. *Wien Klin Wochenschr* 2017;129:369-71. [CrossRef]
16. Ünal Y. A new and early marker in the diagnosis of acute complicated appendicitis: Immature granulocytes. *Ulus Travma Acil Cerrahi Derg* 2018;24:434-9. [CrossRef]
17. Altiner S, Cebeci E, Sucu BB, Col M, Ermiş İ, Senlikci A, et al. Role of immature granulocytes and total bilirubin values in the diagnosis of perforated appendicitis in patients over 65 years. *Rev Assoc Med Bras* 2022;68:1681-5. [CrossRef]
18. Xu H, Zheng X, Ai J, Yang L. Hemoglobin, albumin, lymphocyte, and platelet (HALP) score and cancer prognosis: A systematic review and meta-analysis of 13,110 patients. *Int Immunopharmacol* 2023;114:109496. [CrossRef]
19. Ekinci F, Balcık OY, Oktay E, Erdogan AP. HALP Score as a new prognostic index in metastatic renal cell cancer. *J Coll Physicians Surg Pak* 2022;32:313-8. [CrossRef]
20. Acar O, Ayhan M, Demir B, Ekinci F, Aytac A, Erdogan AP. HALP Score as a new prognostic factor for patients with metastatic bladder cancer. *J Coll Physicians Surg Pak* 2023;33:1405-9. [CrossRef]
21. Farag CM, Antar R, Akosman S, Ng M, Whalen MJ. What is hemoglobin, albumin, lymphocyte, platelet (HALP) score? A comprehensive literature review of HALP's prognostic ability in different cancer types. *Oncotarget* 2023;14:153-72. [CrossRef]
22. Güler İ, Ustaalioglu İ. Predictive power of HALP score in estimating short-term mortality in patients with acute pancreatitis. *Ulus Travma Acil Cerrahi Derg* 2023;29:1098-102. [CrossRef]

ORJİNAL ÇALIŞMA - ÖZ

Komplike ve komplike olmayan akut apandisit ayırımında HALP skorunun öngörücü değeri

AMAÇ: Akut apandisit, acil abdominal cerrahinin en yaygın nedenlerinden biridir ve komplike vakaların erken teşhisi klinik yönetim için kritik önemi korumaktadır. Beyaz kan hücresi sayımı (WBC), C-reaktif protein (CRP) ve olgunlaşmamış granülosit yüzdesi (IG%) gibi klasik enflamatuvar belirteçler tanıda yaygın olarak kullanılsa da, öngörücü doğrulukları sınırlı kalmaktadır. Hemogloblin, albümin, lenfosit ve trombosit düzeylerini içeren HALP skoru, hem enflamatuvar hem de immüno-beslenme durumunu yansıtarak daha kapsamlı bir yaklaşım sunabilir.

GEREÇ VE YÖNTEM: Bu retrospektif çalışmaya üçüncü basamak bir merkezde Ocak 2022 ile Aralık 2023 tarihleri arasında apendektomi yapılan 854 hasta dahil edildi. Hastalar ameliyat ve patolojik bulgulara göre komplike ve komplike olmayan apandisit olarak iki gruba ayrıldı. Demografik veriler, hemogloblin, albumin, lenfosit, trombosit, WBC, CRP ve IG% değerleri kaydedildi. Bu parametrelerin tanısal performansları istatistiksel olarak değerlendirildi.

BULGULAR: 854 hastanın 112'sinde (%13.1) komplike apandisit vardı. Komplike olgularda ortalama yaş ve kadın oranı anlamlı derecede yüksekti. Komplike grupta CRP, WBC, IG% ve trombosit düzeyleri anlamlı derecede yüksek iken hemogloblin, albümin ve lenfosit sayıları daha düşüktü. HALP skoru komplike apandisit hastalarında komplike olmayan apandisit hastalarına göre anlamlı derecede düşüktü (ortalama 32.8'e karşı 53.4, $p < 0.001$). Sonuçlarımız HALP skorunun en yüksek tanısal performansa sahip olduğunu (AUC: 0.732), bunu CRP (AUC: 0.706), IG% (AUC: 0.645) ve WBC'nin (AUC: 0.574) izlediğini göstermiştir.

SONUÇ: HALP skoru, komplike akut apandisit öngörmek için değerli ve kolay uygulanabilir bir biyobelirteçtir. Hem sistemik inflamasyonu hem de immüno-beslenme durumunu yansıtan parametreleri bir araya getirerek geleneksel enflamatuvar belirteçlerden daha iyi performans göstermektedir. HALP skorunun acil cerrahi değerlendirmelerde rutin olarak kullanılması, yüksek riskli hastaların erken tanımlanmasını kolaylaştırabilir ve klinik karar verme sürecine rehberlik edebilir. Yararlılığını doğrulamak için prospektif, çok merkezli çalışmalara ihtiyaç vardır.

Anahtar sözcükler: Biyobelirteç; HALP skoru; komplike apandisit.

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