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Research Article

PROGNOSTIC VALUE OF THE HALP SCORE IN BREAST CANCER PATIENTS

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Abstract: ***Introduction:*** Breast cancer is among the most prevalent malignancies impacting women globally, with prognosis determined by tumor biology, patient nutrition, and systemic inflammation. Composite indices that include hematological and nutritional variables are gaining recognition for their predictive significance. The Hemoglobin, Albumin, Lymphocyte, and Platelet (HALP) score amalgamates essential host-related variables, presenting a prospective instrument for outcome forecasting. **Aims:** To evaluate the prognostic significance of the HALP score in patients with breast cancer and to determine its association with clinicopathological parameters, treatment outcomes, and overall prognosis.**Materials and Methods:** This observational study was conducted over a period of 10 months in a tertiary care hospital. A total of 45 patients with histologically confirmed breast cancer were included. Baseline demographic details, tumor characteristics, staging, and laboratory parameters were recorded. The HALP score was calculated. Patients were categorized into low and high HALP score groups using a predetermined cutoff value. Treatment modalities were noted, and patients were followed to assess treatment response, postoperative outcomes, and early disease progression. The association between HALP score and variables such as tumor stage, lymph node status, histological grade, and response to therapy was analyzed. **Results:** Of the 45 patients, the average age fell within the middle-aged demographic, with most exhibiting stage II or III illness. A substantial proportion of people with advanced tumor stage, increased tumor size, and positive lymph node involvement exhibited low HALP scores. Patients with a low HALP score demonstrated inferior treatment response and an elevated incidence of early illness progression relative to those with a high HALP score. A statistically significant correlation was identified between low HALP values and adverse clinicopathological characteristics ($p < 0.05$). Patients exhibiting elevated HALP scores showed enhanced surgical recovery, superior treatment response, and a more advantageous short-term prognosis during the follow-up interval. **Conclusion:** Reduced HALP levels have been associated to advanced disease and unfavorable outcomes, while elevated scores are related with improved prognosis. Integrating HALP into standard pre-treatment assessment may enhance risk classification, facilitate clinical decision-making, and inform personalized treatment planning.

Keywords: Breast cancer, HALP score, hematological index, inflammatory markers, nutritional status.

INTRODUCTION

Breast cancer persists as one of the most common malignancies impacting women globally and is a significant public health issue due to its increasing prevalence, diverse manifestations, and inconsistent treatment results.[1] Despite advancements in diagnostic methodologies, surgical intervention, systemic treatment, and radiotherapy, forecasting patient prognosis continues to be intricate.[2]

Conventional prognostic indicators, including tumor dimensions, lymph node involvement, histological grading, hormone receptor status, HER2 expression, and molecular classification, yield significant insights; nonetheless, they may inadequately reflect the impact of host-related variables on disease advancement.[3,4] Consequently, researchers have increasingly concentrated on discovering straightforward, dependable, and economical biomarkers that indicate the patient's systemic and nutritional condition, which can substantially influence tumor behavior and therapy efficacy.

In recent years, inflammation- and nutrition-based indicators derived from standard laboratory measures have garnered interest as potential predictive instruments in many malignancies, including breast cancer.[5] Systemic inflammation is pivotal in cancer development, growth, and progression by affecting the tumor microenvironment, angiogenesis, and metastatic routes.[6] Nutritional insufficiency and compromised immune function can impede the patient's capacity to endure treatment and generate an efficient host response.[7] Composite biomarkers that amalgamate inflammatory and nutritional elements provide a comprehensive evaluation of the patient's physiological reserve and cancer-associated metabolic load.[8]

The Hemoglobin, Albumin, Lymphocyte, and Platelet (HALP) score is an emerging biomarker that indicates many host variables affecting cancer prognosis.[9] Hemoglobin and albumin concentrations act as markers

of dietary status and systemic inflammation. The lymphocyte count indicates immunological competence, but the platelet count is connected with cancer-related inflammation and pro-tumorigenic activity.[10] The HALP score integrates these criteria into a singular numerical number, offering a thorough evaluation of the patient's overall health, inflammatory status, and capacity to combat tumor progression.[11]

Prior research in gastrointestinal, urological, and pulmonary malignancies has demonstrated that diminished HALP scores correlate with unfavorable prognosis, heightened postoperative complications, suboptimal treatment response, and decreased survival rates.[12,13]

Nonetheless, investigations into the predictive relevance of the HALP score in breast cancer remain scarce, with minimal studies examining its association with clinicopathological characteristics, disease stage, or short-term outcomes. Due to the accessibility and affordability of HALP components, the score demonstrates significant potential for integration into standard clinical assessments, particularly in resource-limited environments. Integrating the HALP score into clinical decision-making may allow physicians to promptly identify high-risk patients, customize treatment regimens more efficiently, and enhance patient counseling.

AIMS AND OBJECTIVES

- To evaluate the prognostic significance of the HALP score in patients with breast cancer
- To determine its association with clinicopathological parameters, treatment outcomes, and overall prognosis.

MATERIALS AND METHODS

This observational study was conducted in the Department of General Surgery at Sree Mookambika Institute of Medical Sciences over a period of ten months. A total of 45 patients diagnosed with breast cancer and admitted for evaluation and treatment were included. All patients underwent detailed clinical assessment, laboratory investigations, and histopathological confirmation prior to enrollment. Baseline demographic data, tumor characteristics, clinical stage, laboratory parameters, and treatment details were recorded using a structured proforma.

Patients were included if they were newly diagnosed with primary breast cancer, were above 18 years of age, and had complete laboratory data available to calculate the HALP score. Those with recurrent breast cancer, prior chemotherapy or radiotherapy, pre-existing hematological disorders, active infections, chronic inflammatory diseases, liver dysfunction, renal impairment, or incomplete medical records were excluded in order to avoid confounding factors that could influence hematological and biochemical parameters. Pregnant women and individuals unwilling to participate in the study were also excluded.

Venous blood samples were collected at the time of admission to obtain hemoglobin, serum albumin, total lymphocyte count, and platelet count. These parameters were used to calculate the HALP score using the formula:
HALP = Hemoglobin × Albumin × Lymphocyte count / Platelet count.

Based on a predetermined cutoff value, patients were categorized into low and high HALP score groups. Each participant underwent standard staging investigations including imaging and histopathological evaluation to document tumor size, lymph node involvement, and disease stage.

All patients were managed according to standard treatment protocols for breast cancer, including surgery, chemotherapy, radiotherapy, and hormonal therapy as indicated. Treatment modality and response were recorded. Patients were followed during the hospital stay and subsequent review visits to assess postoperative recovery, treatment tolerance, and early disease progression. The association between HALP score and clinicopathological variables such as stage, nodal status, tumor grade, and treatment outcome was analyzed.

Data were entered into a statistical software system (SPSS 20.0) and subjected to appropriate analysis. Categorical variables were expressed as frequencies and percentages, whereas continuous variables were presented as mean and standard deviation. The relationship between HALP score and various prognostic factors was evaluated using chi-square test for categorical variables and student t-test for continuous variables. A p-value < 0.05 was taken as statistically significant. COMM: 79:2023-24

RESULTS

Most patients 26 (57.8%) were between 40–60 years, and 27 (60%) were postmenopausal, reflecting the typical demographic distribution seen in breast cancer. (Table 1)

Table 1: Demographic Characteristics of the Study Population

Variable	Category	n (%)
Age (years)	<40	10 (22.2%)
	40–60	26 (57.8%)
	>60	9 (20.0%)
Menopausal status	Premenopausal	18 (40.0%)
	Postmenopausal	27 (60.0%)

Table 2: Clinicopathological Characteristics

Variable	Category	n (%)
Tumor size	≤2 cm	11 (24.4%)
	>2 cm	34 (75.6%)
Tumor stage	Stage I	6 (13.3%)
	Stage II	19 (42.2%)
	Stage III	20 (44.5%)
Lymph node status	Negative	14 (31.1%)
	Positive	31 (68.9%)
Histological grade	Grade I	9 (20.0%)
	Grade II	22 (48.9%)
	Grade III	14 (31.1%)

Most patients had tumors >2 cm (75.6%), with stage II/III disease constituting the majority 39 (86.7%). Lymph node positivity was seen in 31 (68.9%), indicating advanced presentation. (Table 2)

Table 3: Correlation of HALP Score with Clinical Variables

Variable	Category	Low HALP (n=28)	High HALP (n=17)	p value
Age	<50 years	10 (35.7%)	6 (35.3%)	0.97
	≥50 years	18 (64.3%)	11 (64.7%)	
Tumor size	≤2 cm	4 (14.3%)	7 (41.2%)	0.03
	>2 cm	24 (85.7%)	10 (58.8%)	
Tumor stage	I–II	8 (28.6%)	17 (100%)	0.001
	III	20 (71.4%)	0 (0%)	
Lymph node status	Positive	23 (82.1%)	8 (47.1%)	0.02
	Negative	5 (17.9%)	9 (52.9%)	
Histological grade	Grade I–II	14 (50.0%)	17 (100%)	0.001
	Grade III	14 (50.0%)	0 (0%)	

Low HALP scores were observed in 28 (62.2%) patients and high HALP score in 17(37.8%) patients, suggesting poorer baseline nutritional and inflammatory status among a substantial proportion.

Low HALP score showed statistically significant correlation with larger tumor size (p=0.03), advanced stage (p=0.001), positive lymph nodes (p=0.02), and high-grade tumors (p=0.001). These findings indicate that patients with a low HALP score had more aggressive disease features. (Table 3)

Table 4: Correlation of HALP Score with Treatment Response

Treatment Response	Low HALP (n=28)	High HALP (n=17)	p value
Good response	9 (32.1%)	14 (82.4%)	0.001
Poor response / progression	19 (67.9%)	3 (17.6%)	

Treatment response was significantly better in patients with high HALP scores (p=0.001). Low HALP was associated with poor clinical response or early progression. (Table 4)

DISCUSSION

The current study, comprising 45 breast cancer patients, predominantly included individuals aged 40 to 60 years, with a notable fraction being postmenopausal, indicative of the standard demographic distribution of the disease. majority of patients exhibited advanced-stage tumors, with almost 75% having lesions above 2 cm and over 66% classified at stages II or III. The prevalence of lymph node positive was significant, reflecting a

considerable burden of locally progressed illness in the sample.

Rahman J et al.[14] reported a mean age comparable to that observed in this investigation, with a breast lump as the predominant presenting symptom. Their findings indicated a prevalence of tumors above 2 cm and a significant proportion of advanced-stage illness, highlighting parallels in clinical presentation among populations. Asrar I et al.[15] noted a similar age pattern, highlighting a significant percentage of premenopausal women and a prevalence of left-sided occurrences, while also identifying the upper outer quadrant as the most commonly affected region. These observations correspond with the attributes recorded in the current dataset.

A lower HALP score was observed in a significant percentage of patients in this study, indicating impaired nutritional or immune-inflammatory status at the time of diagnosis. Literature provides evidence for this relationship. Soomro R et al.[16] documented a median HALP score of 5.7 and noted no significant disparities in clinical characteristics between the low and high HALP groups. The current analysis revealed distinct correlations between low HALP scores and more aggressive tumor traits. Patients with diminished HALP values demonstrated increased occurrences of tumors exceeding 2 cm, augmented lymph node involvement, and a significantly elevated percentage of stage III illness. High-grade tumors were more prevalent in the low HALP group, corroborating the concept that diminished HALP indicates a compromised immune-nutritional profile linked to aggressive tumor biology.

The predictive importance of HALP has been emphasized in several external investigations. Zhao Z et al.[17] identified HALP, BMI, TNM stage, and diabetes as independent prognostic factors for survival, indicating that individuals with elevated HALP scores have enhanced outcomes. Duran A et al.[18] observed an elevated incidence of axillary lymph node positive in low HALP groups, however they reported no clear association between HALP and overall nodal burden.

Seyyar M et al.[19] exhibited markedly elevated pathological complete response rates in patients with superior combined immune–nutritional scores, hence reinforcing the significance of systemic inflammatory indicators in treatment efficacy. The treatment outcomes in this study aligned with this trend, demonstrating significantly improved therapeutic responses in patients with elevated HALP scores and a greater incidence of unsatisfactory responses or early progression in those with low HALP scores.

Survival data from Jiang T et al.[20] and Lou C et al.[21] shown enhanced overall and progression-free survival in patients with elevated HALP scores, hence affirming its prognostic significance. Nevertheless, conflicting results have been documented. Alandağ C et al.[22] determined that HALP was not a prognostic indicator in early-stage triple-negative breast cancer, indicating that its predictive significance may differ based on tumor subtype and illness stage.

The persistent correlation identified between low HALP scores and negative clinical characteristics in this investigation underscores the potential value of HALP as a supplementary biomarker. By incorporating indicators of nutrition, immunology, and inflammation, HALP may assist doctors in the early identification of high-risk patients, thereby informing decisions related to enhanced monitoring, supportive care, or nutritional therapies.

The study was limited by its restricted sample size and brief follow-up period, potentially hindering the generalizability of the results. Laboratory discrepancies, absence of long-term outcome evaluations, and the impact of unquantified dietary or inflammatory variables may also compromise the precision and clinical interpretation of the HALP score.

CONCLUSION

The HALP score serves as a simple, cost-effective, and valuable prognostic indicator in breast cancer. Reduced HALP values were significantly correlated with increased tumor size, advanced stage, lymph node involvement, elevated histological grade, and diminished treatment response, signifying more aggressive disease characteristics. Conversely, elevated HALP scores were associated with improved physiological condition and more advantageous treatment results. The HALP score, derived from commonly conducted laboratory testing, can be easily integrated into standard clinical evaluations. Its utilization may improve early risk assessment, facilitate treatment planning, and assist in directing personalized management of breast cancer patients.

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CONFLICTS OF INTEREST:
There are no conflicts of interest

REFERENCES

1. Cuthrell KM, Tzenios N. Breast cancer: updated and deep insights. International Research Journal of Oncology. 2023;6(1):104-18.
2. Wilkinson L, Gathani T. Understanding breast cancer as a global health concern. The British journal of radiology. 2022 Feb 1;95(1130):20211033.
3. Dai X, Xiang L, Li T, Bai Z. Cancer hallmarks, biomarkers and breast cancer molecular subtypes. Journal of cancer. 2016 Jun 23;7(10):1281.
4. Łukasiewicz S, Czeczelewski M, Forma A, Baj J, Sitarz R, Stanisławek A. Breast cancer—epidemiology, risk factors, classification, prognostic markers, and current treatment strategies—an updated review. Cancers. 2021 Aug 25;13(17):4287.
5. Zhang XW, Ge YZ, Song MM, Ruan GT, Xie HL, Hu CL et al. Prognostic power of nutrition-inflammation indicators in patients with breast

cancer. Clinical Breast Cancer. 2023 Jul 1;23(5):e312-21.
6. Nishida A, Andoh A. The role of inflammation in cancer: mechanisms of tumor initiation, progression, and metastasis. Cells. 2025 Mar 25;14(7):488.
7. Habanjar O, Bingula R, Decombat C, Diab-Assaf M, Caldefie-Chezet F, Delort L. Crosstalk of inflammatory cytokines within the breast tumor microenvironment. International journal of molecular sciences. 2023 Feb 16;24(4):4002.
8. Xie H, Ruan G, Ge Y, Zhang Q, Zhang H, Lin S et al. Inflammatory burden as a prognostic biomarker for cancer. Clinical Nutrition. 2022 Jun 1;41(6):1236-43.
9. Qian C, Liu J, Meng C, Cheng J, Wu B, Liao J. The significant prognostic value of the hemoglobin, albumin, lymphocyte, and platelet (HALP) score in digestive system cancers: a systematic review and meta-analysis. BMC cancer. 2025 Oct 14;25(1):1577.
10. Sheinenzon A, Shehadeh M, Michelis R, Shaoul E, Ronen O. Serum albumin levels and inflammation. International journal of biological macromolecules. 2021 Aug 1;184:857-62.
11. Sahin TK, Guven DC, Durukan M, Baş O, Kaygusuz Y, Arik Z et al. The association between HALP score and survival in patients treated with immune checkpoint inhibitors. Expert Review of Anticancer Therapy. 2025 Jan 2;25(1):81-9.
12. Köşeci T, Seyyar M, Aydınalp Camadan Y, Çelik H, Mete B, Demirhindi H et al. HALP Score in Predicting Response to Treatment in Patients with Early-Stage Gastric Cancer: A Multi-Centred Retrospective Cohort Study. Medicina. 2024 Dec 20;60(12):2087.
13. Liu Q, Xie H, Cheng W, Liu T, Liu C, Zhang H et al. The preoperative hemoglobin, albumin, lymphocyte, and platelet score (HALP) as a prognostic indicator in patients with non-small cell lung cancer. Frontiers in Nutrition. 2024 Nov 28;11:1428950.
14. Rahman J, Hossain MM, Ali M. Clinico-pathological features of breast cancer: A Hospital-Based Case-control Study. The Insight. 2022 Nov 14;5(01):89-100.
15. Asrar I, Usman M, Javeed S, Anwar A, Naseem N, Nagi AH, Saeed A. Breast carcinoma: A clinicopathological study of 90 cases. The Professional Medical Journal. 2020 Feb 10;27(02):381-7.
16. Soomro R, Rizwan S, Fatima N, Zia M. Assessing the Prognostic Utility of the HALP Score in Breast Cancer and Its Association with Axillary Lymph Node Involvement. Jour Clin Med Res. 2024;5(3):1-7
17. Zhao Z, Xu L. Prognostic significance of HALP score and combination of peripheral blood multiple indicators in patients with early breast cancer. Frontiers in Oncology. 2023 Dec 12;13:1253895.
18. Duran A, Pulat H, Cay F, Topal U. Importance of HALP score in breast cancer and its diagnostic value in predicting axillary lymph node status. J Coll Physicias Surg Pak. 2022; 32: 734. 2016 Dec;739.
19. Seyyar M, Şancı PC, Köşeci T, Karakayalı A, Akdağ MÖ, Temi YB et al. HALP-H Index as a Prognostic Biomarker for Predicting Pathological Complete Response in Early-Stage HER2-Positive Breast Cancer—A Multicenter Retrospective Cohort Study. Journal of Clinical Medicine. 2025 Jun 22;14(13):4431.
20. Jiang T, Sun H, Xue S, Xu T, Xia W, Wang Y et al. Prognostic significance of hemoglobin, albumin, lymphocyte, and platelet (HALP) score in breast cancer: a propensity score-matching study. Cancer Cell International. 2024 Jul 2;24(1):230.
21. Lou C, Jin F, Zhao Q, Qi H. Correlation of serum NLR, PLR and HALP with efficacy of neoadjuvant chemotherapy and prognosis of triple-negative breast cancer. American Journal of Translational Research. 2022 May 15;14(5):3240.
22. Alandağ C, Yılmaz MU, Ucar M, Demır N, Erdiş ED, Yücel Bİ. Prognostic Significance of HALP Score in Early Stage Triple-Negative Breast Cancer. Eurasian Journal of Medical Investigation. 2022;6(4).