TAM METİN BİLDİRİ

Predictive Role of the ALBI Score in Short and Long Term Mortality Among Patients Presenting to the Emergency Department With Infective Endocarditis

Acil Servise Başvuran Enfektif Endokardit Hastalarında ALBI Skorunun
Kısa ve Uzun Dönem Mortaliteyi Öngörmedeki Rolü

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ABSTRACT

Objective: *This study aimed to evaluate the predictive power of the Albumin–Bilirubin (ALBI) score for short-term and long-term mortality in patients presenting to the emergency department (ED) with infective endocarditis (IE).*

Material and Method: *In this retrospective study, 104 adult IE patients were included. Patients were categorized into low-risk (≤ -2.6) and high-risk (> -2.6) groups based on their ALBI scores. Survival was assessed using Kaplan–Meier and multivariate Cox regression analyses.*

Results: *The 30-day mortality rate was 24.3% in the high ALBI group compared to 2.9% in the low ALBI group ($p=0.001$). Cox regression analysis revealed that each 1-SD increase in the ALBI score was an independent predictor of long-term mortality (HR 1.77, 95% CI 1.40–2.24).*

Conclusion: *The ALBI score is a practical, independent marker based on routine laboratory data that strongly predicts both short- and long-term survival for risk stratification of IE patients in the ED.*

Keywords: *Infective endocarditis, Albumin–bilirubin score Mortality, Emergency department, Risk stratification*

ÖZET

Amaç: *Bu çalışma, acil servise başvuran enfektif endokardit (EE) hastalarında Albumin–Bilirubin (ALBI) skorunun kısa ve uzun dönem mortaliteyi öngördürücü gücünü değerlendirmeyi hedeflemiştir.*

Gereç ve Yöntem: *Retrospektif çalışmaya 104 erişkin EE hastası dahil edilmiştir. Hastalar ALBI skoruna göre düşük (≤ -2.6) ve yüksek (> -2.6) riskli olarak iki gruba ayrılmış; sağkalım analizleri Kaplan-Meier ve Cox regresyon yöntemleriyle yapılmıştır.*

Bulgular: *Yüksek ALBI grubunda 30 günlük mortalite %24.3 iken, düşük grupta %2.9 olarak saptanmıştır ($p=0.001$). Cox regresyon analizi, ALBI skorundaki her 1 standart sapmalık artışın uzun dönem mortalite riskini 1.77 kat artırdığını (HR 1.77) ortaya koymuştur.*

Sonuç: *ALBI skoru, acil serviste EE hastalarının risk sınıflamasında pratik, rutin laboratuvar verilerine dayanan ve hem kısa hem uzun dönem sağkalımı güçlü şekilde öngören bağımsız bir belirteçtir.*

Anahtar Kelimeler: *Enfektif endokardit, Albumin–bilirubin skoru Mortalite, Acil servis, Risk sınıflaması*

INTRODUCTION

Infective endocarditis (IE) is a life-threatening disease associated with high early mortality and requires prompt risk stratification in the emergency department (1,2). The albumin–bilirubin (ALBI) score reflects systemic inflammation and metabolic impairment and has emerged as an objective prognostic biomarker in different clinical settings (3–6). This study aimed to evaluate the association between ALBI score and short- and long-term mortality in patients presenting with IE.

MATERIALS AND METHODS

This retrospective single-center study included 104 consecutive adult patients diagnosed with IE according to modified Duke criteria. ALBI score was calculated using admission serum albumin and total bilirubin levels. Patients were categorized into low (≤−2.6) and high (>−2.6) ALBI groups. The primary endpoint was 30-day mortality, and long-term mortality was defined as the secondary endpoint. Kaplan–Meier survival analysis, multivariable Cox proportional hazards regression, and generalized additive model analyses were performed.

Table 1 presents the baseline demographic characteristics, comorbidities, laboratory findings, and clinical outcomes of patients diagnosed with infective endocarditis classified into low (≤ −2.6) and high (> −2.6) ALBI groups.

Kaplan–Meier survival curves comparing infective endocarditis patients with low (≤ −2.6) and high (> −2.6) ALBI scores. The x-axis represents follow-up duration (months), and the y-axis represents survival probability. Patients in the high ALBI group demonstrated significantly lower survival during follow-up. The lower panel shows the number of patients at risk at each time point (Figure 1).

The forest plot displays hazard ratios (HRs) and 95% confidence intervals of variables included in the multivariable Cox regression model. Each 1-standard deviation increase in ALBI score was independently associated with mortality (HR: 1.77; 95% CI: 1.40–2.24; p = 0.001) (Figure 2).

RESULTS

Mean age was 52.4±16.7 years and 32.7% of patients were female. Inflammatory markers were significantly higher in the high ALBI group (Table 1). Thirty-day mortality (24.3% vs 2.9%, p=0.001) and long-term mortality (41.4% vs 5.9%, p<0.001) were significantly higher in patients with elevated ALBI scores. Kaplan–Meier analysis showed reduced survival in the high ALBI group (Figure 1). In multivariable analysis, ALBI score remained an independent predictor of long-term mortality (HR 1.77; 95% CI 1.40–2.24; p=0.001) (Figure 2).

CONCLUSION

ALBI score is independently associated with early and long-term mortality in IE patients and may serve as a practical risk stratification tool.

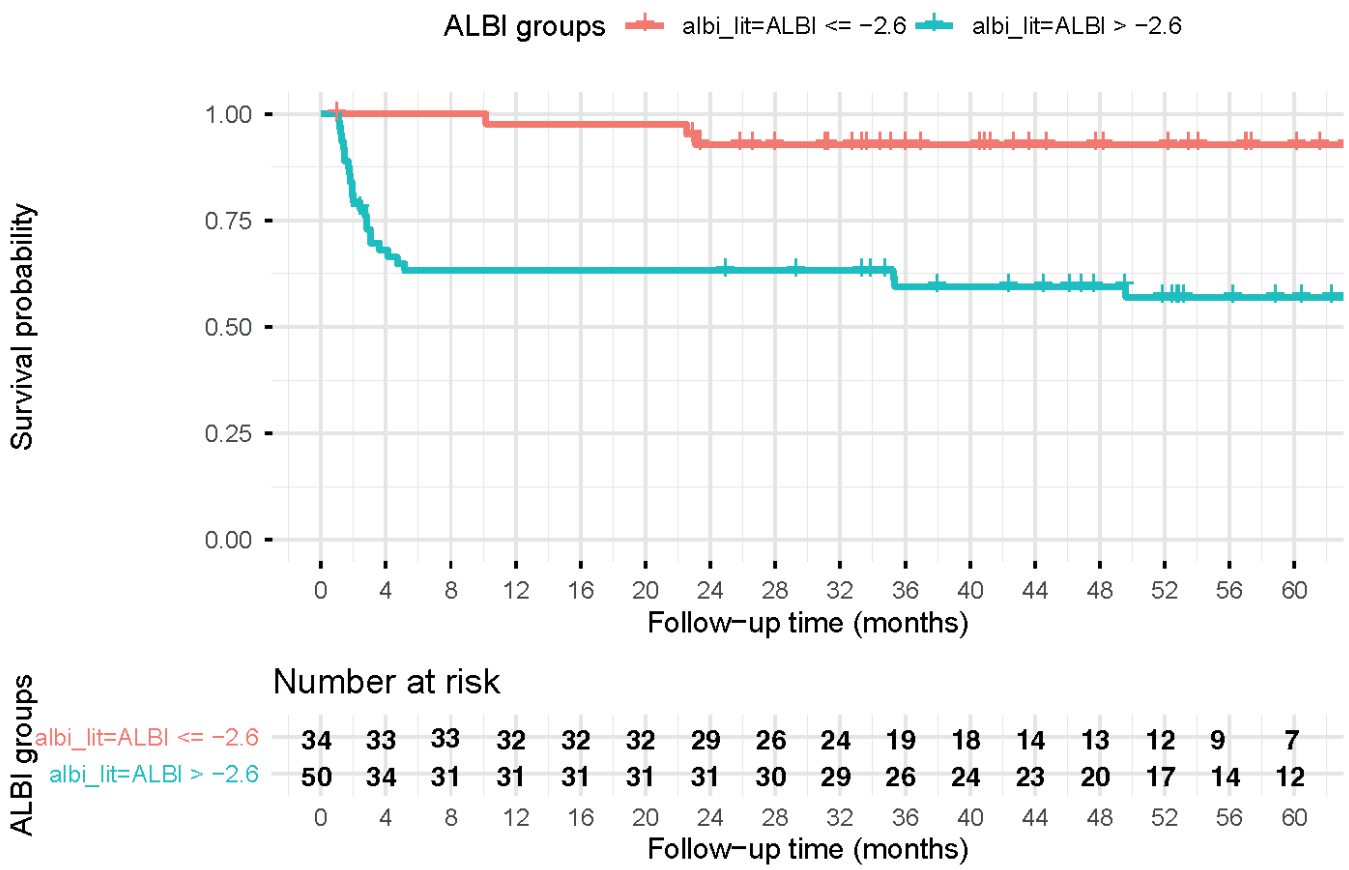

Figure 1: Kaplan–Meier survival analysis.

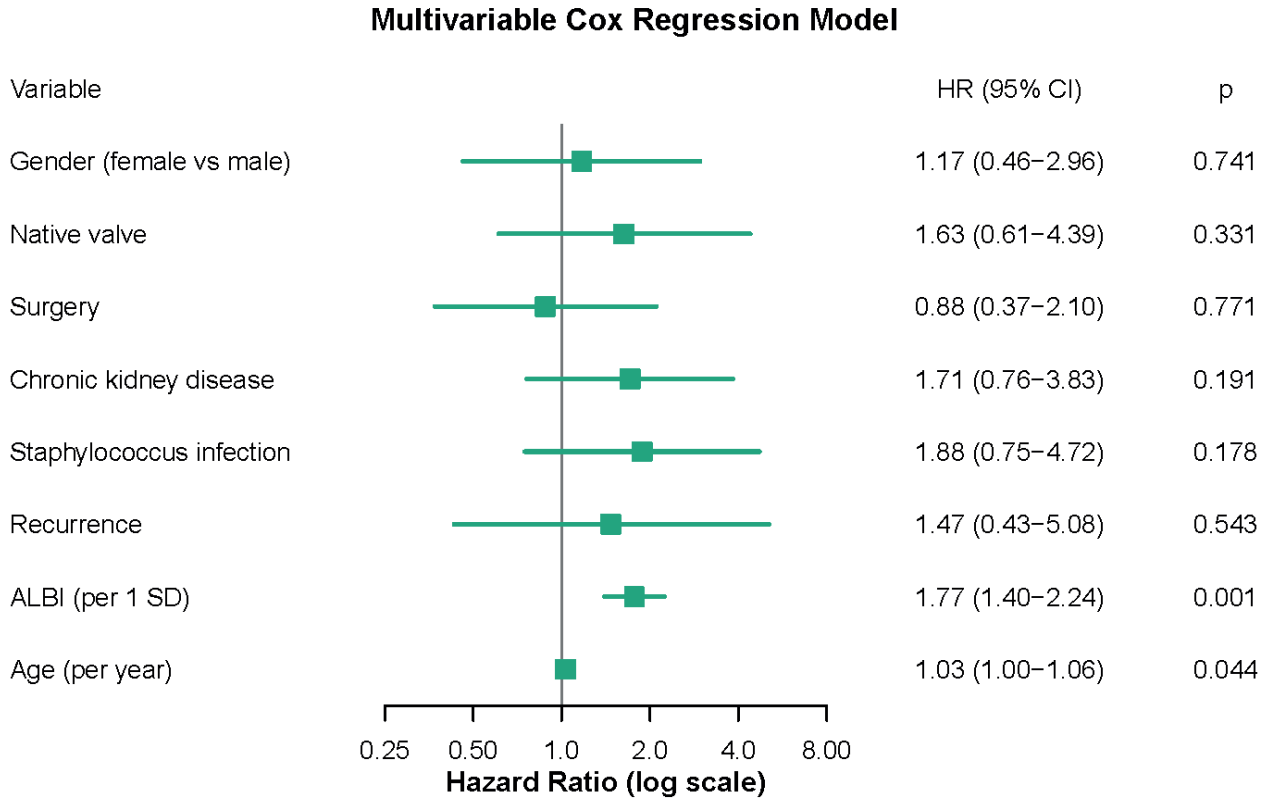

Figure 2: Multivariable Cox regression analysis (forest plot).

Table 1: Baseline clinical characteristics, laboratory findings, and clinical outcomes of infective endocarditis patients stratified according to ALBI score.

Variable	Total (n = 104)	Low ALBI (n = 34)	High ALBI (n = 70)	p value
Baseline demographic and clinical characteristics				
Female sex, n (%)	34 (32.7)	10 (29.4)	24 (34.3)	0.722
Age (years), mean ± SD	52.4 (16.7)	51.0 (17.1)	53.1 (16.6)	0.498
Native valve, n (%)	66 (63.5)	21 (61.8)	45 (64.3)	0.573
Surgical treatment, n (%)	63 (60.6)	21 (61.8)	42 (60.0)	0.740
Cardiovascular risk factors and comorbidities				
Diabetes mellitus, n (%)	46 (44.2)	13 (38.2)	33 (47.1)	0.232
Hypertension, n (%)	40 (38.5)	9 (26.5)	31 (44.3)	0.082
Coronary artery disease, n (%)	14 (13.5)	3 (8.8)	11 (15.7)	0.292
Cerebrovascular event, n (%)	22 (21.2)	6 (17.6)	16 (22.9)	0.567
Peripheral artery disease, n (%)	2 (1.9)	1 (2.9)	1 (1.4)	0.605
Chronic kidney disease, n (%)	37 (35.6)	6 (17.6)	31 (44.3)	0.013
LVEF (%), mean ± SD	62.9 ± 7.7	64.8 ± 1.5	62.0 ± 9.2	0.054
Laboratory findings and parameters				
Glucose (mg/dL)	123 (17.1)	127 (16.6)	121 (17.0)	0.055
Creatinine (mg/dL)	0.89 (0.78–1.68)	0.81 (0.78–0.97)	1.0 (0.78–2.25)	0.029
eGFR (mL/min/1.73 m²)	103 (46–134)	106 (94–134)	90 (35–134)	0.076
Troponin (ng/mL)	0.014 (0.012–0.034)	0.014 (0.012–0.024)	0.014 (0.012–0.034)	0.398
CRP (mg/L)	78 (51–125)	65 (45–92)	87 (60–145)	0.007
Procalcitonin (ng/mL)	0.34 (0.13–1.21)	0.24 (0.07–0.37)	0.45 (0.23–1.47)	0.002
LDH (U/L)	256 (178–366)	195 (169–302)	289 (188–433)	0.015
WBC (×10⁹/L)	9.1 (7.5–10.2)	9.3 (8.6–9.9)	8.9 (7.3–10.7)	0.970
Neutrophil count (×10⁹/L)	6.9 (4.9–10.3)	3.1 (3.0–5.8)	8.1 (5.7–10.7)	0.015
Lymphocyte count (×10⁹/L)	1.4 (1.0–2.1)	1.36 (0.9–1.9)	1.4 (1.1–2.6)	0.381
Hemoglobin (g/dL)	9.5 ± 1.38	9.83 ± 1.26	9.37 ± 1.43	0.337
Platelet count (×10⁹/L)	270 (213–340)	278 (250–355)	245 (175–301)	0.002
Clinical outcomes				
Recurrence, n (%)	7 (6.7)	2 (5.9)	5 (7.1)	0.473
30-day mortality, n (%)	18 (17.3)	1 (2.9)	17 (24.3)	0.001
Long-term mortality, n (%)	23 (27.1)	2 (5.9)	21 (41.4)	<0.001

ALBI, albumin–bilirubin score; SD, standard deviation; DM, diabetes mellitus; HT, hypertension; CAD, coronary artery disease; CVD, cerebrovascular disease; PAD, peripheral artery disease; CKD, chronic kidney disease; LVEF, left ventricular ejection fraction; eGFR, estimated glomerular filtration rate; CRP, C-reactive protein; LDH, lactate dehydrogenase; WBC, white blood cell count.

Conflict of Interest: The authors declares no conflict of interest.

Ethics: This study was approved by the Scientific Research Ethics Committee of Koşuyolu High Specialization Training and Research Hospital (approval date: 05 August 2025; decision no: 2025/13/1208).

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Approval of final manuscript: All Authors

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