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Comparison of the Predictive Performance of Syncope Scoring Systems in Patients Over 60 Years of Age Presenting to the Emergency Department with Syncope

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OBJECTIVE: This study aimed to compare the ability of five syncope risk scores to predict 30-day adverse outcomes in patients aged ≥60 years presenting to the emergency department (ED).

MATERIAL and METHODS: This was a single-center, prospective, observational diagnostic accuracy study. Consecutive ED patients ≥60 years with syncope were enrolled. Demographics, vital signs, and biomarkers at presentation were recorded, and the following scores were calculated: Risk Stratification of Syncope in the Emergency Department (ROSE), San Francisco Syncope Rule (SFSR), Syncope Risk Score (SRS), Canadian Syncope Risk Score (CSRS), and Boston Syncope Criteria (BSC). Thirty-day adverse outcomes (death, acute coronary syndrome, arrhythmia, pacemaker/ICD requirement, pulmonary thromboembolism, or cerebrovascular event) were ascertained. Discrimination was assessed by ROC analysis; AUCs were compared using the DeLong test.

RESULT: A total of 284 patients were analyzed. Thirty-day adverse outcomes occurred in 51 patients (17.9%): death 29.4%, acute coronary syndrome 23.5%, pulmonary thromboembolism 23.5%, cerebrovascular event 23.5%, arrhythmia 3.9%, and pacemaker/ICD requirement 2.0%. Patients with adverse outcomes were older (median 79 vs. 72 years; $p<0.001$); female sex was associated in univariable analysis ($p=0.029$). Higher respiratory rate ($p=0.002$) and lower oxygen saturation ($p=0.028$) were observed in the adverse-outcome group. Adverse outcomes were associated with lower hemoglobin/hematocrit ($p=0.022$ and $p=0.037$) and higher troponin, BNP, BUN, creatinine, and INR (all $p\leq0.048$), whereas lactate was not significant ($p=0.833$). Among the five scores, the Boston criteria demonstrated the greatest discrimination (AUC 0.755) with sensitivity 94.1% and NPV 97.1%, supporting strong rule-out performance; SRS showed the highest specificity (78.5%). The AUC difference between Boston and Canadian scores was significant (DeLong $p=0.033$).

CONCLUSION: In the comparison of five different syncope risk scores, the Boston Syncope Criteria demonstrated the greatest discriminatory power for identifying adverse outcomes, with the highest sensitivity and AUC values. However, its low specificity led to classification of many patients as high-risk, potentially resulting in increased use of advanced diagnostic testing. The Syncope Risk Score showed the highest specificity, but its sensitivity remained relatively low.

Given that older patients often have multiple comorbidities and polypharmacy and may not always present with typical symptoms, there remains a need for the development of risk scores specifically tailored to this population, and for their validation in prospective, multicenter studies.

Keywords: Syncope, ROSE risk score, San Francisco Syncope Rule, Syncope Risk Score, Canadian Syncope Risk Score, Boston Syncope Criteria