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Can the Canadian Syncope Risk Score (CSRS) help to risk stratify emergency department patients presenting with syncope without an evident serious cause?

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Article Type: Prospective multicentre cohort study

Ratings: *Methods* 4/5, *Usefulness* 4/5

Introduction

Background

Syncope is a common and often benign presentation to emergency departments (EDs); however, syncope risk stratification remains a challenge for emergency physicians.

Objectives

The Canadian Syncope Risk Score (CSRS) validation study aims to determine the CSRS's ability to predict 30-day serious adverse events in patients presenting to ED with syncope.

Methods

Design

Prospective, multicentre cohort study.

Setting

Nine tertiary care academic EDs in Ontario, Quebec, British Columbia and Manitoba.

Inclusion

Patients ≥ 16 years presenting to the ED within 24 h of a syncopal event in which no serious underlying condition was evident.

Exclusion

Prolonged loss of consciousness (> 5 min), altered mental status, witnessed seizure, head trauma, hospitalization required for traumatic injuries, unable to obtain history or consent, and obvious cause identified on index visit.

Outcomes

Primary outcome was 30-day serious adverse events including: any arrhythmia, need for a pacemaker or cardioversion, structural heart disease, myocardial infarction, aortic dissection, pulmonary embolism, pulmonary hypertension, subarachnoid hemorrhage or death from any cause.

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Main results

The mean observed probability of serious outcomes in the validation cohort was 3.65% (95% CI 3.09–4.28%). A total of 160 (3.9%) of patients were excluded as serious conditions were identified during initial ED assessment. Of the $N = 3819$ patients included in the analysis, 139 (3.6%; 95% CI 3.1–4.3%) patients experienced 30-day serious outcomes.

In the low-risk groups, 0.3% of very low risk and 0.7% of low-risk patients experienced any serious 30-day outcome with no ventricular arrhythmias or deaths observed. In the highest risk group, 51.3% of patients experienced any serious outcome with 7 deaths and 33 arrhythmias observed.

At a threshold score of − 1, the CSRS performed with a sensitivity of 97.8% (95% CI 93.8–99.6%) and a specificity of 44.3% (95% CI 42.7–45.9%). The AUC of the model was 0.91 (95% CI 0.88–0.93).

Appraisal

Strengths

- Large, prospective cohort with consecutive patient enrolment
- Multiple recruitment sites across Canada
- Excluded patients with evident serious pathology (and, therefore, clear disposition plan)
- Sensitivity analysis done for both missing troponin data and patients lost to follow-up
- Reasonable follow-up period (30 days)
- Assumed death from any cause related to arrhythmia (conservative estimate of risk)
- Methodical and thorough multi-step follow-up (hospital visits, telephone interview and administrative data)
- Low number ($n = 152$, 3.7%) of patients lost to follow-up
- Adherent to STROBE reporting guidelines

Limitations

- Missing troponin value for 41% of patients
- Fewer patients in higher risk groups making the sensitivity and specificity estimates in these groups less reliable
- Score relies on clinician gestalt of cardiac versus vasovagal syncope
- Nearly 20% of eligible patients not recruited or entered in study
- No analysis of how/if admission and discharge patterns were impacted by score implementation (however, only 6.5% of the total cohort was classified as high or very high risk and, therefore, likely minimal impact on admission rate)

Context

Prior attempts to develop syncope risk prediction tools for the ED include the San Francisco Syncope Rule (SFSR) and Risk Stratification of Syncope in the Emergency Department (ROSE) rule. Both SFSR and ROSE had lower performance on validation (SFSR sensitivity 87%, specificity 52%; ROSE sensitivity 87.2%, specificity 65.5%), and included patients with serious pathology identified in the ED [1, 2]. A syncope risk tool is appealing for identifying patients who may benefit from admission or expedited workup. However, future research should explore how the CSRS performs compared to physician gestalt and the impact it may have on admission decisions, as similar tools have not shown benefit over clinical judgment [3].

Bottom line

The Canadian Syncope Risk Score (CSRS) was successfully validated in this large, multicentre prospective cohort study. The CSRS performed well to identify patients presenting with syncope who are at low risk of serious 30-day outcomes and, therefore, appropriate for ED discharge. Importantly, the rule is easy to use and does not rely on uncommonly ordered biomarkers (e.g. BNP) or unnecessary physical exams (e.g. rectal exam). Unlike previously developed syncope risk tools (SFSR, ROSE), CSRS provides a more nuanced assessment of risk categorization and is designed to be used in patients without an evident serious cause of syncope on initial exam.

Compliance with ethical standards

Conflict of interest The authors declare no conflict of interest.

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