DEM Journal Club

Article Appraisal

Article: Thiruganasambandamoorthy V, Kwong K, Wells GA, Sivilotti ML, Mukarram M, Rowe BH, Lang E, Perry JJ, Sheldon R, Stiell IG, Taljaard M. Development of the Canadian Syncope Risk Score to predict serious adverse events after emergency department assessment of syncope. CMAJ. 2016 Sep 6;188(12):E289-98. doi: 10.1503/cmaj.151469. Epub 2016 Jul 4.

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Background and Study Objective(s):

A patient with syncope has a differential ranging from benign to life-threatening. Up until now, emergency physicians have used clinical gestalt to decide the likelihood of adverse events in individual patients. Many clinical decision rules have been developed over the past 20 years, but none have made their way into clinical practice due to impracticability or methodologic flaws. This study attempted to develop a clinical decision rule to aid emergency physicians in identifying patients at high risk of a serious adverse event from syncope within 30 days.

Study Design:

This was a multi-centre prospective cohort study designed to identify candidate predictors that best correlated with risk of serious adverse events within 30 days after disposition from the ED, both inpatient and outpatient with excellent follow-up. The outcome measured was “serious adverse event” (SAE) which included all potential patient-oriented complications of syncope etiologies. Candidate predictor variables were designated a priori by expert consensus and whittled down via multiple logistic regression modeling yielding the top nine predictors of serious adverse events. These predictors were then internally validated through statistical methods (internal bootstrapping, goodness-of-fit testing) and adapted into a point-based scale: the Ottawa Syncope Risk Score.

Results:

Almost 12,000 patients were screened which yielded 4322 included in the study and a total of 4030 patients after loss to follow-up. Direct telephone contact was achieved with 95.7% of patients or their family. The SAE composite outcome was observed in 3.6% of patients. Cardiac events were most common (2.4%) and primarily included pacemaker insertion, arrhythmias, structural heart disease and MI. ‘Other causes’ accounted for 0.9% of SAE and mostly included pulmonary embolism and gastrointestinal bleeds. Death occurred in 0.5% of cases. The final model used to derive the Canadian Syncope Risk Score included the following predictors:

Category	Points
Clinical evaluation	
Predisposition to vasovagal symptoms*	−1
History of heart disease†	1
Any systolic pressure reading < 90 or > 180 mm Hg‡	2
Investigations	
Elevated troponin level (> 99th percentile of normal population)	2
Abnormal QRS axis (< −30° or > 100°)	1
QRS duration > 130 ms	1
Corrected QT interval > 480 ms	2
Diagnosis in emergency department	
Vasovagal syncope	−2
Cardiac syncope	2
Total score (−3 to 11)	____

A score of −2 or lower conferred a very low risk of SAE (< 1%), scores of −1 to 3 conferred a low to medium risk (1%–8%), and scores of 4 or more conferred a high or very high risk (> 12%). The rule performed better in low risk patients with narrower confidence intervals for scores < 5, and a sensitivity of 99.2% (95% CI 95.9 – 100%) for a threshold score of −2 or higher.

Validity of Results:

The population from which the rule was derived included an appropriate spectrum of patients and their characteristics were well defined. The final selected predictors were pragmatic and performed well in the multivariable logistic regression model used to derive the score. Some patients had missing predictors in the records (ie., 52% of patients had no troponin), but most of these patients were in the group with no SAE so the authors did not feel this would compromise the validity of the results. Two of the predictors are subjective (ED diagnosis of vasovagal or cardiogenic syncope) but the authors argue that diagnostic impression has been previously incorporated into successful models such as the Wells Score. The composite outcome is broad and includes highly pertinent outcomes such as death and cardiac events. However, it also includes 30-day events for which the underlying pathology was not necessarily present or preventable at the initial visit, such as an appendicitis, small bowel obstruction or sepsis. This could potentially diminish the sensitivity and clinical relevance of the rule. Finally, external validation is required before the tool can be clinically utilized.

Generalizability of Results:

This study is well generalized to our emergency department population in Canada. Once validated, these results can be applied to a variety of adult patients who present within 24 hours of a syncopal event. Clinicians must be cautious not to inappropriately apply the rule to situations involving trauma, possible seizure activity, substance use or prolonged loss of consciousness

The Bottom Line:

This study has delivered us a new clinical decision rule to help evaluate patients with syncope. It is methodologically rigorous and makes intuitive clinical sense. It requires external validation (currently ongoing at sites across Canada) to be applied to clinical practice. Assuming this comes to pass, it may not change current clinical practice as clinical gestalt is still an integral part of the rule. However, this study does reassure us that our clinical gestalt for identifying cardiac and vasovagal syncope is reasonably good, and the risk of SAE in 30 days is low in “low risk” patients. Furthermore, in those “intermediate risk” patients, this rule may help add some objective measure of risk to help guide a decision on disposition and urgency of follow-up.