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Original Article

Accuracy of the Canadian new risk score as in hospital prognostic score for the Egyptian patients with acute coronary syndrome

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ABSTRACT

Objectives: Patients with acute coronary syndrome (ACS) need to be risk stratified to deliver the most appropriate therapy. There is no appropriate score for early-risk stratification at the time of the first medical contact with ACS patients. Canada Acute Coronary Syndrome Risk Score (Canadian-ACS) is a new risk score for early prognostication in acute coronary syndromes. The aim of our study is to evaluate the accuracy and validity of Canadian-ACS risk score as a prognostic score for in-hospital risk stratification of patients with ACS, as compared to TIMI AND GRACE risk scores in the Egyptian patients.

Methods: Our study included 79 patients having acute coronary syndrome admitted to CCU. Calculations of The Canada Acute Coronary Syndrome Risk Score (Canadian-ACS) and ranged from 0 to 4, with 1 point assigned for the presence of: age ≥ 75 years, Killip class >1 , systolic blood pressure <100 mm Hg, and heart rate >100 beats/min.

Results: In our study, there is a strong association between Canadian-ACS and TIMI risk score with sensitivity 85.7% and specificity 100.0% and Grace risk score with sensitivity 78.1% and specificity 85.1%. The negative predictive value of a Canadian-ACS score ≥ 1 is $\geq 84.4\%$ for short-term in hospital morbidity and mortality, and for score ≥ 2 at $\geq 98\%$.

Conclusion: the Canadian-ACS is a valid accurate and simple prognostic risk score for short-term risk stratification in patients with ACS independent of hypertension, diabetes, smoking and troponin level.

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1. Introduction

Coronary heart disease is one of the most common causes of death worldwide.¹ Patients with acute coronary syndrome (ACS) need to be risk stratified to give the appropriate therapy.² A quick assessment of the patient's history, physical examination, electrocardiography and cardiac chemical biomarker allow accurate diagnosis and early risk stratification, which is essential for guiding treatment.³ The TIMI Risk Score for Unstable Angina/NSTEMI is the best known chest pain risk score tool.⁴ The GRACE risk score is the most commonly used in clinical practice. However, ACS risk scores need to be re-assessed in clinical practice.² Despite the availability of several acute coronary syndrome (ACS) prognostic risk scores, there is no ideal score for early-risk stratification at the emergency department with patients with ACS. I. The Canada Acute Coronary Syndrome Risk Score is a simple new prognostic risk score that permits rapid stratifications of patients with acute coronary

syndrome. Because this score is easy to be calculated by health care professionals. The Canada Acute Coronary Syndrome Risk Score (Canadian-ACS) is ranged from 0 to 4, with 1 point for each variable: age ≥ 75 years, Killip class >1 , systolic blood pressure <100 mm Hg, and heart rate >100 beats/min.⁵ The aim of our study is to evaluate the accuracy and validity of (Canadian-ACS) risk score as a new in hospital prognostic score for patients with ACS, as compared to TIMI and GRACE risk scores in the Egyptian patients (Table 1).

2. Methods

This study included 79 patients (63 male & 16 female) having acute coronary syndrome admitted to the CCU from June 2015 till Jan 2016. The evaluation of the patients' complaint focused on chest pain, associated symptoms, and risk factors (sex, age, hypertension, diabetes mellitus, dyslipidaemia, smoking and positive family history of CAD). The history of prior episodes of myocardial ischemia such as stable or unstable angina, MI, CABG, or PCI. A physical examination was performed for all patients: Heart rate whether regular or irregular. Arterial blood pressure: The auscultatory method of BP measurement was used according

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Table 1
The association between GRACE and TIMI.

TIMI score * GRACE score			GRACE score		Total	χ^2	P	Kappa agreement
			Not high risk	High risk				
TIMI score	Not high risk	N	47	18	65	24.99	0.00**	0.48
		%	100.0%	56.2%				
	High risk	N	0	14	14			
		%	0.0%	43.8%				
Total		N	47	32	79			
		%	100.0%	100.0%				

Significant association and agreement between TIMI and GRACE.

Table 2
Association between C-ACS and TIMI risk scores.

C-ACS score			TIMI score		Total	χ^2	P	Kappa agreement
			Not high risk	High risk				
Not high risk <2	N	65	2	67	84.8%	65.6	0.00**	0.9
	%	100.0%	14.3%					
High risk ≥ 2	N	0	12	12	15.2%			
	%	0.0%	85.7%					
Total	N	65	14	79	100.0%			
	%	100.0%	100.0%					

There is a strong association between C-ACS and TIMI risk score with sensitivity 85.7% and specificity 100.0%.

Table 3
Association between C-ACS score and GRACE risk scores.

C-ACS score			GRACE score		Total	χ^2	P	Kappa agreement
			Not high risk	High risk				
Not high risk <1	N	40	7	47	59.5%	31.58	0.00**	0.63
	%	85.1%	21.9%					
High risk ≥ 1	N	7	25	32	78.1%			
	%	14.9%	78.1%					
Total	N	47	32	79	100.0%			
	%	100.0%	100.0%					

There is a less strong association between C-ACS and Grace risk score with sensitivity 78.1% and specificity 85.1%.

to (JNC 8 guidelines).⁶ Killip class: Class I: Absence of rales over the lung fields and absence of S3. Class II: Rales over 50% or less of the lung fields or the presence of an S3. Class III: Rales over more than 50% of the lung fields (pulmonary edema). Class IV: Cardiogenic shock.⁷ The calculation of The Canada Acute Coronary Syndrome Risk Score (C-ACS) and ranged from 0 to 4, with 1 point for each variables: age ≥ 75 years, Killip class >1 , systolic blood pressure <100 mm Hg and heart rate >100 beats/min.⁵ 12 leads electrocardiogram was done on admission: according to their initial ECG, the patients were classified into: ACS with ST segment elevation, ACS without ST segment elevation and ACS with undetermined ECG changes. Transthoracic Echocardiography was done using (vivid E9 echocardiography machine) for every patient. We stressed on the examination of the function of left ventricle (EF %), the presence of Mitral regurgitation in addition to the presence or absence of segmental wall motion abnormalities (according to the American Society of Echocardiography guidelines).⁸ The Management of the patients was according to the

recommendations of ACC/AHA guidelines for management of ACS (2015).⁹ In hospital MACE including: death, major bleeding, re-infarction, target vessel revascularization, arrhythmias and heart failure were recorded.

2.1. Statistical analysis

Data were collected and submitted to statistical analysis using (SPSS version 20.0) (Statistical Package for the Social Sciences) (IBM, New York, NY, USA) software. According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean \pm SD, the following tests were used to test differences for significance. The chi square test: This test was used to compare two groups regarding the distribution of different variables. ROC curve: A receiver operating characteristic or simply ROC curve analysis for detection of cut off value, sensitivity and specificity. Correlation was done using Pearson correlation. P value is significant if <0.05 (Tables 2 and 3; Figs. 1 and 2).

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