Title: Predictive and Prognostic Value of Newly Defined (CHA2DS2-VASc-HSF) Score in Patients with Non ST Elevation Acute Coronary Syndrome

Category: Acute Coronary Syndromes

Abstract

Background: Careful risk assessment of acute coronary syndrome (ACS) patients helps clinicians determine prognosis and guide management. We aim to evaluate the ability of the CAD CHA_2DS_2-VASc-HSF score: CHA2DS2-VASc score (congestive heart failure; hypertension; age ≥75 years [doubled]; type 2 diabetes; previous stroke, TIA, or thromboembolism [doubled]; vascular disease; age 65–74 years; and sex category) & Added HSf for hyperlipidemia, smoking and family history of coronary artery disease (CAD) for the prediction of coronary artery disease severity and its effectiveness as a risk stratification tool for major adverse cardiovascular events (MACE) in patients with Non ST Elevation-ACS (NSTE-ACS) without known atrial fibrillation (AF).

Method: It is a prospective, observational, non-randomized study which included 200 patients with NSTE-ACS without AF. Coronary angiography (CA) was done and the syntax score was calculated for all patients to detect severity of CAD and compare it with the summation of the total CHA2DS2-VASc-HSF score, then follow up for 6 months after discharge for development of MACE.

Results: The patients were classified into 3 groups according to their risk factors calculated by CHA_2DS_2-VASc-HSF score: Low (< 2), Moderate (2- 4), High (≥5). They were also classified according to the severity of CAD calculated by SYNTAX score (SS) into mild, moderate and severe CAD. Prevalence of family history of CAD was higher in the high SS group than in the other tertiles. Patients with high CHA_2DS_2-VASc-HSF score and high syntax class were smokers and had significantly higher age, higher frequency of CHF, HTN, DM, vascular disease, and hyperlipidemia. It was noticed that CHA_2DS_2-VASc-HSF score had significant positive correlation with syntax score (r= 0.63; $P< 0.001$) and at cutoff point ≥5, CHA_2DS_2-VASc-HSF Score had 64% sensitivity and 90% specificity for prediction of high syntax score with diagnostic accuracy 85% and area under curve was 0.78.

Multivariate regression analysis revealed that the only predictor for high syntax score was high CHA_2DS_2-VASc-HSF ($P< 0.001$). 143 patients responded to the follow up 6 months after discharge; 16/143 (11.11%) patients developed MACE; 15/143(10.5%) patients developed nonfatal MI, one reported case of death 1/143 (0.7%) and no reported cases of stroke (0%). Frequency of HTN, DM, vascular diseases and hyperlipidemia was significantly higher among those patients who developed MACE & they also showed significantly higher SYNTAX and CHA_2DS_2-VASc-HSF scores. At a cutoff point >3; CHA_2DS_2-VASc-HSF score had 100% sensitivity, 58% specificity for the prediction of development of nonfatal MI with diagnostic accuracy 62 % and area under curve 0.79.

Conclusion: As the CHA_2DS_2-VASc-HSF score increase, the severity of CAD increase and the incidence of MACE also increase. The CHA_2DS_2-VASc-HSF Score could be used as a novel predictor of CAD severity and as a risk stratification tool for development of MACE in NSTE-ACS patients.

Affiliations:

Table 1: Characteristics of studied patients

Table 2: Regression analysis for prediction of high syntax score

Table 1: Characteristics of studied patients

	N= 200
Age (years) Range Age ≥ 75 years Age between 65- 74 years	55.84 ± 10.13 30- 80 1 (0.5%) 42 (21%)
Sex Male Female	 145 (72.5%) 55 (27.5%)
Negative troponin (UA)	155 (77.5%)
Positive troponin (NSTEMI)	45 (22.5%)
Hypertension	118 (59%)
Diabetes mellitus	97 (48.5%)
Hyperlipidemia	147 (73.5%)
Smoking	117 (58.5%)
Family history	54 (27%)
Previous stroke or TIA	1 (0.5%)
Vascular disease	80 (40%)
Congestive heart failure	24 (12%)

Data was expressed in form of mean (SD), frequency (percentage)

(**NSTEMI**: Non-ST myocardial infarction; **UA**: unstable angina; **TIA**: transient ischemic attack)

Table 2: Regression analysis for prediction of high syntax score

Variables	Odd's ratio	95% Confeidence interval	*P* value
Age	8.79	1.78- 9.01	0.87
Congestive heart failure	0.89	0.11- 1.93	0.65
Diabetes mellitus	1.09	1.40- 2.80	0.85
Hyperlipidemia	1.62	0.39- 6.75	0.50
High CHA_2DS_2-VASc-HSF	**3.45**	**3.01- 6.90**	**< 0.001**
Smoking	0.87	0.44- 1.11	0.56
Vascular disease	1.52	0.58- 4.44	0.43

P value was significant if < 0.05