بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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MONA MAGHRABY

The Added Value of ST-Elevation in Lead aVR to Clinical TIMI Score in Predicting the Angiographic Severity of Coronary Artery Disease in Patients with Non ST-Elevation Myocardial Infarction

Thesis

Submitted for Partial Fulfillment of
Master Degree in **Cardiology**

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List of Abbreviations

Abb.	Full term
ACS	*Acute coronary syndrome*
AMI	*Acute myocardial infarction*
AVNRT	*Atrioventricular nodal reentry tachycardia*
CAD	*Coronary artery disease*
CI	*Confidence interval*
ECG	*Electrocardiogram*
HR	*Hazard ratio*
hs-cTn	*High-sensitivity cardiac troponin*
LAD	*Left anterior descending coronary artery*
LDL	*Low-density lipoprotein*
LMCA	*Left main coronary artery*
LV	*Left ventricular*
MI	*Myocardial infarction*
NSTEMI	*Non ST-segment elevation myocardial infarction*
OR	*Odds ratio*
PAI-1	*Plasminogen activator inhibitor-1*
SCAD	*Spontaneous coronary artery dissection*
SPECT	*Single photon-emission computed tomography*
STEMI	*ST-segment elevation myocardial infarction*
TF	*Tissue Factor*
TIMI	*Thrombolysis in Myocardial Infarction*
UA	*Unstable angina*
UA/NSTEMI	*Unstable angina or non–ST elevation myocardial infarction*
UR	*Urgent revascularization*

INTRODUCTION

Atherosclerosis is the ongoing process of plaque formation involving primarily the intima of large and medium-sized arteries; the condition progresses relentlessly throughout a person's lifetime, before finally manifesting itself as an acute ischemic event. The term acute coronary syndrome (ACS) includes unstable angina (UA), non ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI) ***(Kumar and Cannon, 2012).***

Each year, a large number of patients in the United States are hospitalized for unstable angina or non–ST elevation myocardial infarction (UA/NSTEMI), a condition also referred to as non–ST-ACS ***(Cannon and Braunwald, 2012).***

Unstable angina/NSTEMI constitutes a clinical syndrome subset of ACS that is usually, but not always, caused by atherosclerotic CAD and is associated with an increased risk of cardiac death and subsequent MI. In the spectrum of ACS, UA/NSTEMI is defined by ECG ST-segment depression or prominent T-wave inversion and/or positive biomarkers of necrosis (e.g., troponin) in the absence of ST-segment elevation and in an appropriate clinical setting (chest discomfort or anginal equivalent). During non-STEMI, there will be elevation of the biomarkers, indicative of myocardial necrosis. During unstable angina, however, there is no or only very minimal

elevation. This is the main distinguishing feature between the two diagnoses ***(Anderson et al., 2007).***

The prevalence of NSTE-ACS is increasing relative to ST-segment elevation myocardial infarction (STEMI) due to changes in the distribution of risk factors in the population (e.g., older age, predominance of females, higher rate of diabetes), use of preventative medications, and increasingly sensitive troponin assays ***(Giugliano and Braunwald, 2015).***

Frailty is a condition defined as a loss of biological reserve, which leads to impaired response to stressor events. Frailty has become a substantial factor in assessment of several special medical situations and has been established as a crucial issue into clinical decision making. Furthermore, the pathophysiologic mechanism of this condition, like higher markers of thrombosis (D-dimer), endocrine unbalances, elevated inflammatory state (C-reactive protein and interleukin-6) and higher oxidative stress levels, contribute to the onset and outcome of ACS. It has been identified as a strong independent predictor of in-hospital and 30-day mortality in elderly patients presenting with NSTEMI. Among elderly patients admitted with ACS, 10% of > 65 years and 25%–50% of > 85 are considered frail. Frailty has been demonstrated to increase the all-cause mortality risk by 2.65-fold, any-type cardiovascular disease risk by 1.54-fold, major bleeding risk by 1.54-fold and hospital readmissions risk by 1.51-fold ***(Dai et al., 2016).***

The presentation of non-ST-elevation myocardial infarction can be associated with progressive effort angina, resting pain to post infarction angina. Clinical presentation depends on the severity of the arterial injury, the size and type of thrombus formed, the extent and duration of ischemia, and the amount of previous myocardial necrosis. The extent of ischemia depends on the myocardial distribution of the ischemia-producing artery, the severity of the ischemia-producing stenosis, the absence or presence of collateral circulation, and factors that affect the supply of oxygenated blood or that increase myocardial demands, such as the heart rate, blood pressure, and contractility ***(Hochman et al., 2011).***

The ECG is considered one of the most important initial clinical tests for diagnosing myocardial ischemia and infarction. Its correct interpretation, particularly in the emergency department, is usually the basis for immediate therapeutic interventions and/or subsequent diagnostic tests ***(Wagner et al., 2009).***

The electrocardiographic leads are more helpful in localizing regions of transmural than subendocardial ischemia. The ECG can also provide more specific information about the location of the occlusion within the coronary system (the culprit lesion) ***(Mirvis and Goldberger, 2012).***

The most common ECG change with Subendocardial ischemia is ST Segment Depression. It may be limited to