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Prognostic Value of QRS Complex Fragmentation in Patients with Acute Anterior STEMI undergoing Primary PCI During in-Hospital Stay

Thesis

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Mahmoud Gamal Elgaly Alessawy

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List of Abbreviations

Abb.	Full term
ACS	Acute coronary syndrome
ADP	Adenosine Di Phosphate
CABG	Coronary artery Bypass Grafting
CAD	Coronary artery disease
CVD	Cardiovascular disease
CYP450	Cytochrome P450
DAPT	Dual antiplatelet therapy
DES	Drug-eluting stents
DM	Diabetes mellitus
ECGs	Electrocardiograms
fQRS	Fragmented QRS
GP	Glycoprotein
IQR	Inter-quartile range
IRA	Infarct-related artery
LDL-C	Low-density lipoprotein cholesterol
LVEF	Left ventricular ejection fraction
LVH	Left ventricular hypertrophy
MACE	Major adverse cardiac events
MI	Myocardial infarction
MI	Myocardial infarction
NSTEMI	Non-ST-segment elevation MI
NYHA	New York Heart Association
PCI	Percutaneous coronary intervention
PLATO	PLATelet inhibition and patient Outcomes
R'	R wave
RCTs	Randomised controlled trials
RWMA	Regional wall motion abnormality
SAECG	Signal averaged electrocardiogram
SCAD	Spontaneous coronary artery dissection
SPECT	Single photon emission tomography
SPSS	Statistical Package for Social Science
STEMI	ST elevation myocardial infarction
STEMI	ST-segment elevation MI
UFH	Unfractionated heparin

INTRODUCTION

Primary percutaneous coronary intervention (PCI) as a type of coronary reperfusion therapy may lead to recanalization and improved myocardial reperfusion in patients with ST elevation myocardial infarction (STEMI) ***(Wei et al., 2015).***

The presence of a fragmented QRS (fQRS) complex including narrow or wide QRS complex, which corresponds to the depolarization of the right and left ventricles of the human heart is frequently recorded following surface electrocardiograms (ECGs). Previous studies have identified that fQRS complex on surface ECG is a predictor of adverse cardiovascular events, including cardiac mortality and heart failure ***(Ozcan et al., 2014; Kocaman et al., 2012).***

In clinical terms, the presence of fQRS is common among patients with biventricular enlargement and myocardial infarction (MI) ***(Flowers et al., 1969).*** Furthermore, the presence of fQRS has been associated with decreased myocardial reperfusion and functional deterioration in patients with ischemic heart disease ***(Michael et al., 2007; Mahenthiran et al., 2007).***

Diabetes mellitus, hypertension and hyperlipidemia are known risk factors for ischemic heart disease and may cause greater myocardial remodeling and dysfunction ***(Hajar, 2017)***.

To the best of our knowledge, the association between fQRS and reperfusion and changes in left ventricular function

have not yet been investigated in patients with STEMI that have under gone primary PCI.

Therefore, the objective of the current study was to investigate the association between fQRS and reperfusion and changes in LV function, and to assess the prevelance and the clinical prognostic significance of fQRS in patients with anterior STEMI following primary PCI.

AIM OF THE STUDY

The study sought to investigate the prevelance of fQRS complex in ECG of patients admitted with acute anterior STEMI undergoing primary PCI and its short-term prognostic value during hospital stay.

Chapter 1

S-T SEGMENT ELEVATION MYOCARDIAL INFARCTION (STEMI)

Acute myocardial infarction (MI) is defined as presence of evidence of myocardial injury (defined as rise or fall of cardiac troponins with at least one value more than 99th percentile upper reference limit), with clinical manifestations of myocardial ischemia ***(Thygesen et al., 2018)***.

Ischemic heart disease is the most common cause of mortality worldwide ***(Townsend et al., 2016).*** For the sake of reperfusion therapy, patients with ST-segment elevation, at least in 2 contiguous leads, are diagnosed as ST-segment elevation MI (STEMI). Meanwhile, patients without ST-segment elevation are considered to have non-ST-segment elevation MI (NSTEMI) ***(Roffi et al., 2016).***

Mortality in STEMI patients is affected by including advanced age, history of MI, Killip class, diabetes mellitus, renal failure, left ventricular ejection fraction (LVEF), number of diseased coronaries, time to treatment and treatment strategy ***(McManus et al., 2011).***

Reperfusion therapy after STEMI with the expanding use of primary percutaneous coronary intervention (PCI), new antithrombotic therapy, and secondary prevention has caused the incidence of both acute and long-term mortality to decrease with