ACCURACY OF CHANGES IN ST SEGMENT ELEVATION 60 MINUTES AFTER THROMBOLYTIC TREATMENT IN PREDICTING THE CLINICAL OUTCOME COMPARED WITH THE LATE CHANGES

Thesis

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التنبؤ بمدى التحسن بعد الاحتشاء الحاد لعضله القلب وذلك باستخدام التغيرات الحادثة فى الرسم الكهربائى للقلب فى قطعة **ST** بعد ساعة من إعطاء العقار المذيب للجلطة مقارنة بالتغيرات المتأخره

رسالة
توطئة للحصول على درجة الماجستير
فى أمراض القلب

مقدمـة مــن
عمر محمد الملقب عبد الستار
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Analysis of ST-segment resolution on ECG, after fibrinolytic therapy, in cases of ST elevation Myocardial Infarction offers an attractive and cost effective solution to assess coronary reperfusion. Whereas coronary angiogram is a marker for epicardial reperfusion, ST segment resolution offers a better reflection of microvascular reperfusion. Although successful thrombolysis of the epicardial vessel is necessary for good prognosis, but the micro-vascular flow more strongly correlates with the outcome. ST segment is therefore a better indicator of prognosis, and provides information,

The aim of the work to evaluate the ST segment resolution after reperfusion by thrombolytic therapy as a prognostic predictor of clinical outcome in patients with ST segment elevation myocardial infarction.

Forty patients were included in the study. Their age ranged between 42 to 67 years with a mean of 56.2 ± 7.9 years. They were 29 males (86.3%) and 11 females (13.7%).

Patients received thrombolytic therapy for ST-elevation myocardial infarction were included in the study. Patients with contraindications to thrombolysis, prior history of myocardial infarction, late presentation

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Omar Al Molakab

List of Contents

List of Tables

List of Figures

List of Figures (cont...)

List of Figures (cont...)

List of Abbreviations

ACS	*Acute coronary syndrome*
CABG	*Coronary artery by pass graft*
CK	*Creatine kinase*
CK.MB	*Creatine kinase. MB isoform*
ECG	*Electrocardiogram*
HF	*Heart failure*
LAD	*Left anterior descending coronary artery*
LBBB	*Left bundle branch block*
LVH	*Left ventricular hypotrophy*
MI	*myocardial infarction*
NSTEMI	*Non ST elevation myocardial infarction*
PCI	*Percutaneous coronary intervention*
STEMI	*ST elevation myocardial infarction*

INTRODUCTION

One of the most valuable contributions of ECG is in the diagnosis of myocardial infarction .Pattern of ST segment displacement especially with associated Q waves and T waves changes is highly suggestive if not diagnostic of acute myocardial infarction. The presence of Q waves at presentation with a first acute ST Segment elevation myocardial (STEMI) reflects a more advanced stage of the infarction resolution of ST segment elevation indicating successful myocardial reperfusion may differ according to how far the infarction process has progressed ***(Uyarel et at., 2006)***.

A detailed analysis of ST segment elevation may influence decision regarding the use of reperfusion therapy ***(Zimethaum et al., 1998).***

The management of acute myocardial infarction is targeted towards the restoration of blood flow in infarct related artery ***(Zimethaum et al., 1998).***

The aim of thromblytic in acute myocardial infarction (AMI) is early and complete myocardial reperfusion. In complete or delayed reperfusion is associated with an increased risk of death and left ventricular dysfunction ***(Angeja et al., 2002).***

Resolution of ST segment elevation is believed to be an excellent marker of tissue perfusion and the degree of resolution has proved to be a powerful indicator of prognosis ***(Matezky et al., 1999).***

Assessment of ST segment resolution is also useful for guiding reperfusion therapy .the absence of ST segment resolution during the first 90 minute s after administration of fibrinolytic medication s should prompt consideration of rescue angioplasty ***(Poli et al., 2002).***

A reduction in ST segment elevation by more than 70% in the leads with maximal elevation are associated with the most favorable outcomes ***(Schroder et al., 2001)***.

Early angiographic studies of thrombolysis suggested the most successful reperfusions occur with 60 minutes of thrombolysis which in combination with data form continuous ST segment monitoring strongly suggested that the 12 –lead s ECG at 60 minutes could used to predict clinical outcome ***(Anegeja et al., 2002).***

AIM OF THE WORK

Evaluation of ST segment resolution after reperfusion by thrombolytic therapy as a prognostic predictor of clinical outcome in patients with myocardial infarction.

Chapter (1):

Electrocardiogram in The Diagnosis of Myocardial Ischemia and Infarction

The electrocardiogram (ECG) is an important and sometimes central tool used to establish the diagnosis of myocardial ischemia or infarction. New abnormalities in the ST segment and T waves represent myocardial ischemia and may be followed by the formation of Q waves. However, the electrocardiogram may be normal or nonspecific in a patient with either ischemia or infarction ***(Thygesen et al., 2007).***

The use of the ECG for the diagnosis of myocardial ischemia and myocardial infarction (MI) will be reviewed here. This topic includes important updates on the ECG criteria for myocardial infarction (MI). These changes result from the 2007 Joint European Society of Cardiology/American College of Cardiology Federation/American Heart Association/ World Health Federation (ESC/ACCF/AHA/WHF) Task Force, which redefined acute and prior MI and proposed new criteria necessary to secure the diagnosis (table 1) ***(Thygesen et al., 2007).***

Table (1): Definition of myocardial infarction *(Thygesen et al., 2007)*.

Criteria for acute myocardial infarction
The term myocardial infarction should be used when there is evidence of myocardial necrosis in a clinical setting consistent with myocardial ischaemia. Under these conditions any one of the following criteria meets the diagnosis for myocardial infarction:
Detection of rise and/or fall of cardiac biomarkers (preferably troponin) with at least one value above the 99th percentile of the upper reference limit (URL) together with evidence of myocardial ischaemia with at least one of the following:
Symptoms of ischaemia
ECG changes indicative of new ischaemia (new ST-T changes or new left bundle branch block [LBBB])
Development of pathological Q waves in the ECG
Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality
Sudden, unexpected cardiac death, involving cardiac arrest, often with symptoms suggestive of myocardial ischaemia, and accompanied by presumably new ST elevation, or new LBBB, and/or evidence of fresh thrombus by coronary angiography and/or at autopsy, but death occurring before blood samples could be obtained, or at a time before the appearance of cardiac biomarkers in the blood.
For percutaneous coronary interventions (PCI) in patients with normal baseline troponin values, elevations of cardiac biomarkers above the 99th percentile URL are indicative of peri-procedural myocardial necrosis. By convention, increases of biomarkers greater than 3 x 99th percentile URL have been designated as defining PCI-related myocardial infarction. A subtype related to a documented stent thrombosis is recognized.
For coronary artery bypass grafting (CABG) in patients with normal baseline troponin values, elevations of cardiac biomarkers above the 99th percentile URL are indicative of peri-procedural myocardial necrosis. By convention, increases of biomarkers greater than 5 x 99th percentile URL plus either new pathological Q waves or new LBBB, or angiographically documented new graft or native coronary artery occlusion, or imaging evidence of new loss of viable myocardium have been designated as defining CABG-related myocardial infarction.
Pathological findings of an acute myocardial infarction.
Criteria for prior myocardial infarction
Any one of the following criteria meets the diagnosis for prior myocardial infarction:
Development of new pathological Q waves with or without symptoms.
Imaging evidence of a region of loss of viable myocardium that is thinned and fails to contract, in the absence of a non-ischaemic cause.
Pathological findings of a healed or healing myocardial infarction.