RESEARCH STUDY

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Thrombolytic therapy in acute myocardial infarction st resolution effect in Al-kindy ccu patients

Article Information

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Abstract

Background: study the effect of various risk factors on reperfusion success after thrombolysis by measuring ST resolution.
Objectives: Early patency of the infarct-related artery is associated with reduced mortality. Thrombolytic therapy is frequently followed by rapid recanalization lead to reduction of infarct size, improve left ventricular function and increase survival by reopening of coronary artery . The reduction in ST-segment elevation on the standard 12 lead electrocardiogram 1-4 h after initiation of thrombolysis may be the simplest and most useful clinical tool to test the effectiveness of thrombolytic therapy.
Methods: Seventy patients with acute ST elevation myocardial infarction admitted to alkindy teaching hospital CCU were studied. Early reduction of ST-segment elevation (within 1-3 hours) by >50% on the standard 12 lead ECG with single lead was measured.
Results: 37(53%) of those who receive thrombolytic therapy had ST resolution within 3 hours of thrombolysis. No significant difference concerning gender with ST resolution. younger age patients respond better to thrombolysis than old significantly and with increasing number of risk factors. There is decreasing chance of early ST resolution in those with heart failure features where they had less ST resolution significantly. Serious dysrhythmia treated by DC conversion also show negative significant relation to ST resolution.
Conclusions: Younger age and abscences of cardiovascular risk factors associate more early ST resolution. While late resolution may associate heart failure, serious dysrhythmia and death.

Introduction

Prompt reestablishment of blood flow through an occluded coronary artery is the most important goal in the management of patients with acute myocardial infarction (AMI). Compared with persistent occlusion, early patency of the infarct-related artery is associated with reduced mortality. Thrombolytic therapy is frequently followed by rapid recanalization of totally occluded coronary arteries and saves about 30 lives per 1000 patients receiving treatment within 6 h of the onset of symptoms.(1)

Thrombolytic treatment has been shown to reduce infarct size and improve left ventricular function and survival rate by reopening the infarct-related coronary artery . However, the interdependence and prognostic significance of the chain of events that may follow the administration of a thrombolytic agent in patients with acute myocardial infarction remain unclear. In 20% to 40% of patients, recanalization of the infarct-related coronary artery does not occur, and in 15% to 20%, the open vessel reoccludes ; these events affect in-hospital and long-term prognosis (2).

Although a number of markers of successful coronary thrombolysis have been proposed, only a few of these have the two necessary features of a clinically useful marker: 1- widespread early availability and 2- good predictive value. The reduction in ST-segment elevation on the standard 12 lead electrocardiogram 1-4 h after initiation of thrombolysis may be the simplest and most useful clinical tool to gauge the effectiveness of thrombolytic therapy.(3) Clemmensen(4), Barbash(5) and Bossaert(6), studied the sensitivity and specificity of ST changes as a marker of coronary reperfusion which show a 70-90% sensitivity and 60-80% specificity(3). The post-thrombolytic electrocardiogram (ECG) has shown promise as a non-invasive marker of reperfusion. Previous studies have shown an association between early resolution of ST elevation after thrombolysis and improved coronary patency(7) and clinical outcome(8).

Methods

A prospective descriptive study involve seventy patients with acute ST elevation myocardial infarction admitted to alkindy teaching hospital CCU during july-november 2011,for each history, clinical examination , ECG, and biochemical tests were done to confirm infarction. The ST segment elevation was measured on admission and after 2-3 hours of initiation of thrombolytic therapy with actylase (Altplase-tPA perfused IV as recommended). The early reduction of ST-segment elevation by >50% on the standard 12 lead ECG with single lead data provied a simple and universally applicable marker that could predict outcome at least as accurately as more time consuming measurements of sum ST changes (Single-lead STR is measured by comparing one ECG lead with the most prominent ST-segment deviation at baseline and at a given time point after fibrinolysis, irrespective of the ECG lead measure at baseline. This comparison provides percentages of ST-segment deviation (>50%) recovery independent from any changes in the patient's position or the position of the lead electrodes).(9)

Hypertension, diabetes and smoking only are considerd as cardiovascular risks in this study and diagnosed depending on history, clinical examination or lab. examination.

Serious dysrhythmia considering those need DC for control, signs of left ventricular failure are looked for and registered.

Those who had no ST elevation, or had LBBB, or presented more than 6 hours after starting of pain(1), or had bleeding tendency or contraindication to thrombolytic therapy, or died during the first 12 hours of admission are excluded. Information was tabulated and analyzed using SPSS program, P value of less than 0.05 considered as significant results.

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Results

Seventy patients involved in this study presented with ST elevation myocardial infarction given thrombolysis. Table 1 reveal that 37(53%) of those who receive thrombolytic therapy had ECG ST resolution within 3 hours of thrombolysis while 33 had not. There was no significant difference concerning gender with ST resolution P=0.565.

Table1 gender difference with ST resolution

Gender	Male	female	TOTAL
ST resolution	27	10	37 (53%)
NO ST resolution	22	11	33 (47%)
TOTAL	49	21	70 (100%)

Table 2 show the difference between those older and younger than 50 years of age in relation to ECG resolution after thrombolysis and it was clear that younger age patients respond better to thrombolysis by ST resolution than old significantly P=0.001.

Table 2 relation of age to ST resolution

AGE	< 50 years	≥ 50 years	TOTAL
ST resolution	15	23	38
No ST resolution	1	31	32
Total	16	54	70

P=0.001

Table 3 explain the relation of presence and number of cardiovascular risks involved in the study (hypertension, diabetes and smoking) to ECG ST resolution and it show that with increasing number of risk factors there is decreasing chance of ECG ST resolution.

Table 3 relation of cardiovascular risks presence to ST resolution

No. of Risks	No	one	Tow or three
ST resolution	10	14	9
NO ST resolution	4	12	21
TOTAL	14	26	30

P=0.026 cardiovascular risks are hypertension, diabetes and smoking

Discussion

Table 4 show the relation of ST resolution to presence of heart failure where those with heart failure features apparently had less ST resolution significantly P=0.001. Serious dysrhythmia usually treated by DC conversion also show significant relation to ST resolution where those with no ST resolution need more DC conversion. In addition there was no deaths in those with ST resolution while more than one third of the patients die with no ST resolution with significant difference P=0.011.

Table 4 relation of occurrence of heart failure, serious dysrhythmia and death with ST resolution

		HF		DC		DEATH	
		NO		NO		NO	
ST resolution		2	34	11	25	0	37
No ST resolution		25	9	13	21	9	24
TOTAL	27	43	24	26		9	61

P=0.001 P=0.049 P=0.011

This study reveal that there is no significant difference between the genders in relation to ECG ST resolution (P=0.565). several other studies also confirm that specially colleen study (10) inspite of well known fact that male gender confer more cardiovascular risk . in this study early ST resolution occur in more than halve of patients (53%) and that result is also seen by others as Krucoff and Bahtia (7,11) .

This study show that younger patients significantly had more rapid ST resolution than older patients possibly because of less sever and limited atherosclerosis ,and this is consistent with the results of Maggioni which found that age was the most important independent predictor of in-hospital mortality (12) while others as Mehta show no significant changes (13).

Successful reperfusion was significantly higher in non-diabetic than diabetic (14), also in nonhypertensives reperfusion is higher than in hypertensives (15). And although smokers in some studies have lower mortality after AMI than non-smokers, due in large part to faster epicardial flow(16) but still reperfusion is less in smokers(17).this study show the negative relation of the presence of any of the cardiovascular risk factors combination mentioned to ST resolution and the results are consistent significantly with the above mentioned studies.

There is a lower incidence of death and CHF with increasing ST-segment resolution (18). Several large randomized trials have confirmed the efficiency of thrombolytic therapy in reducing short- and long-term mortality from AMI.(7,10,). Arrhythmias are less frequent in patients who show ST resolution after thrombolysis(19), and these findings also could be demonstrated in this study where there is significant association of non ST resolution with heart failure, DC conversion and death.

Conclusions

Although pain to needle (thrombolysis) time is the most important determinant of successful thrombolysis, there is other factors that may play a role, as younger age,and abscences of cardiovascular risk factors evident by early ST resolution. While late ST resolution may associate heart failure, serious dysrhythmia and death

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