

St Segment Resolution in Patients given Streptokinase Injection along with Guideline directed Medical Therapy

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ABSTRACT

Objective: To determine the ST resolution in patients given streptokinase along with guideline medical therapy

Methodology: This descriptive cross sectional study was carried out in department of Cardiology DHQTH KDA Kohat on 109 patients after obtaining informed consent from the patients. Patients were given guideline directed medical therapy & streptokinase for ST elevation MI. The ST-segment elevation resolution was calculated after 90 minutes of treatment with streptokinase, and stratified as complete ST segment resolution (> 70% ST-resolution), partial resolution (30-70% ST-resolution), or failed resolution (< 30% ST-resolution).

Results: Out of 109 patients, 33 were females & 76 were male patients. Mean age of the population was 57±11.64 (95% CI). Time from onset of chest pain to administration of thrombolytic & guideline directed medical therapy was within 6 hours for 95 patients (87.5%). Out of 109, 9(8%) patients had minor gum bleeding.

Conclusion: Administration of streptokinase is cost effective therapy for STEMI patients & give good resolution of ST segment on ECG.

Key Words: Myocardial infarction, ST resolution

INTRODUCTION

Cardiovascular problems are the main cause of death all around the world; however the data from Pakistan is least reported globally¹. Majority of cardiac events occur due to partial or complete occlusion of coronary artery. Such an occlusion of coronaries leads to the elevation of ST segment on ECG. Any resolution of ST segment after administration of the appropriate therapy like thrombolytic, aspirin, clopidogrel & statin will be helpful to assess guide to the effectiveness of therapy. Measuring ST resolution is not only cost effective, but also easy & rapid bedside tool, which if resolved may reliably indicate that microvascular circulation has improved².

Although the best therapy for ST elevation MI is percutaneous intervention & stenting but in some cases treatment with thrombolytic is the only option available to the patient. Effective thrombolysis leading to resolution of the ST segment has good impact on long-term prognosis of the patient³. Door to needle time <30 minutes for treatment with thrombolysis is the time limit to achieve maximum benefit from use of thrombolytics^{4,5}.

Our current study is aimed at finding out the effectiveness of thrombolysis in the current era of guideline directed medical therapy. We analyze whether using streptokinase help the patient in ST segment resolution on ECG. Here we want to see whether streptokinase remains a viable option for a patient with ST elevation MI in a place like Kohat or the government should provide either a cath lab facility or a better thrombolytic medication for patients. Our door to needle time was 30±5minutes.

MATERIALS & METHODS

The study spanned over 6 months period from 1st July to 31st December 2020. Sampling technique used was consecutive sampling. A total of 109 Patients aged 20years

or above from both genders, with chest pain diagnosed as STEMI based on the definition used in the universal definition of myocardial infarction were included in the study. All those included were already on guideline directed medical therapy & had no contraindications to the use of thrombolytic.

Our study was a descriptive cross sectional study. A detailed history of patient was taken. ECG was recorded & interpreted within 10 minutes of arrival to emergency services. Therapy including aspirin, Clopidogrel, low molecular weight heparin i.e. Enoxaparin & statin was administered under the supervision of qualified cardiologist. Streptokinase was administered within 30±5minutes of arrival. After 90 minutes of the administration of thrombolytic, the ST segment resolution was recorded. Complete resolution was defined as a reduction of >70%, partial resolution as a reduction of 30% to 70%, and no resolution as reduction of <30% in ST elevation 90 minutes post thrombolysis. Data was analyzed by IBM SPSS (statistical package for Social Sciences) version 22 for windows.

RESULTS

The mean age of our study population was 57.7±11.64, age range 30 to 85 years. Out of 109 patients 33 were females & 76 were males.

95 patients came to emergency room in less than 6 hours of chest pain and received Streptokinase, while only 14 patients were received & thrombolysed within time window of 6 to 12 hours of chest pain. The administration of thrombolytic was accompanied by Aspirin, clopidogrel, statin & low molecular weight heparin i.e. Enoxaparin in the appropriate dosing as per guidelines from American heart association.

Our study population had 47 hypertensives, 18 smokers, 31 diabetics & 08 patients with Hyperlipidemia. Obesity was present in 03 patients. (Table 1). Majority of the patients had Inferior wall MI i.e. 42, followed by 35 Anterolateral, 28 Anterior, 03 lateral & 01 inferolateral STEMI. (Table 2)

Complete ST resolution i.e. >70% was found in 57, incomplete or partial resolution of ST segment in 32, while no resolution of ST segment was found in 20 patients (Table 3). Only 9 patients had minor bleeding in the form of gum bleeding. There were no cases of major bleeding.

Table 1: Characteristics of study population

Variable	Frequency	Percentage
Gender		
Females	33	30.2%
Males	76	69.7%
Hypertension		
Yes	47	43.11%
No	62	56.8%
Smoking		
Yes	18	16.5%
No	91	83.5%
Diabetes mellitus		
Yes	31	28.4%
No	78	71.5%
Family history		
Yes	03	0.027%
No	106	97.24%
Hyperlipidemia		
Yes	08	0.073%
No	101	92.66%

Table 2: Types of myocardial infarction (n=109)

Variable	Frequency (n=109)	Percentage
Inferior wall mi	42	38.5
Anterolateral MI	35	32.1
Anterior wall M	28	25.7
Lateral wall MI	3	2.8
Inferolateral MI	1	0.9
Total	109	100

Table 3: ST Resolution (n=109)

Variable	Frequency	Percentage
Complete (>70%)	57	52.3%
Partial (30-70%)	32	29.4%
Failed thrombolysis (<30%)	20	18.3%
Total	109	109

DISCUSSION

Pakistan is a poor country & its 24.3% population lives below the poverty line⁶. Data regarding ST elevation MI in our population is lacking. The only available cost effective streptokinase is the thrombolytic available for our poor patients. As the cost of Alteplase is more & it keeps on increasing, streptokinase becomes an option for poor patients of ST elevation MI^{7,8}. However effectiveness of streptokinase in resolving ST segment elevation in the era of modern oral medicines, has not been studied in our province of Khyber Pakhtunkhwa. Two recent studies from Peshawar did not have a proper door to needle time achieved. As compared to the local data in these two

studies by Saleem S et al & Ali J et al^{9,10}, our study had much of the population being thrombolysed earlier and we are the first to claim that our patients received proper oral therapy in addition, as well.

In our study guideline directed medical therapy¹¹ was given along with thrombolytic administration and so the complete resolution of ST segment was achieved in 57 out of 109 patients, as compared with 43 out of 83 patients in the study by Saleem et al. These both results are comparable. However when we compare partial resolution of ST segment, then 11% of our population was above that of the study population of Saleem et al. (Table 4).

Our study indicates that streptokinase; despite administered within time & with other standard medications, could not help the complete ST segment resolution in 52(47.7%) patients. This figure is quite alarming and put a big question mark on continuing streptokinase as treatment strategy in the modern era of percutaneous intervention. Streptokinase increase Thromboxan A2 & prothrombotic state, that may affect the efficacy of stenting in the same patient treated with stenting, later on. As Percutaneous intervention in STEMI improves survival, its use in STEMI is strongly advocated in treatment of MI¹³⁻¹⁵, as we find that despite being a cheap medication, timely administration, streptokinase does not deliver a great help with basic parameter of ST resolution in nearly half of the patients with appropriate indication & concomitant guideline directed medical therapy. We admit that our sample size is small, and this may have affected the results.

Table 4: Comparison of our study with another study at Peshawar

Study	Complete ST resolution	Partial ST resolution	Failed thrombolysis
Our (n=109)	57(52.3%)	32(29.4%)	20(18.3%)
Saleem et al(n=83)	43(51.8%)	21(25.3%)	19(22.8%)

CONCLUSION

In our population streptokinase is not much helpful in nearly half of the population despite being administered early & with other guideline directed medical therapies. We need to improve the thrombolytic quality to newer thrombolytic in our health system or provide the percutaneous intervention as first line of therapy, unless it is contraindicated.

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