OUTCOME OF THROMBOLYTIC AND NON-THROMBOLYTIC THERAPY IN ACUTE MYOCARDIAL INFARCTION

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OBJECTIVE:

To compare morbidity, in hospital mortality and benefits of Streptokinase (SK) therapy and Non-Streptokinase (non-SK) therapy in acute myocardial infarction patients.

METHODS:

Retrospective review of the medical record of 300 patients with all types of acute MI admitted in our CCU between Nov. 2000-April 2001.

RESUTLS:

Out of 300 patients, 210 (70%) were male and 90 (30%) were female. 150 (50%) were given SK therapy and 150 (50%) did not receive SK therapy because they did not qualify. Mean age was 55 years. The success of SK therapy was judged indirectly through non-invasive measures.

LIMITATIONS:

This data is from a hospital which does not have invasive or PCI facilities, hence it was totally dependant on non-invasive measures. However, this might help in patient management in our society where most hospitals/CCUs do not have invasive facilities.

CONCLUSION:

The overall survey shows that not only mortality was improved in SK group but also patients had less complications, early pain relief and shorter hospital stay. However, due to higher earlier event rate in SK group, these patients should preferably be referred to a facility having interventional support.

KEY WORDS:

SK verses non-SK therapy, Acute Myocardial Infarction (MI) and related complications, Percutaneous Coronary Intervention (PCI)

INTRODUCTION

Patients with acute MI have better outcome with SK therapy compared to non-SK therapy, especially when given within 3 hours. However, benefits within 12 hours of chest pain have been reported (1). Aspirin when given with SK therapy reduces re-

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infarction and improves survival (2).

In GUSTO trial, deaths and non-fatal strokes were 6.9% for accelerated TPA, 7.7% for SK with subcutaneous heparin and 7.9% for SK with IV heparin. Other international trials have reported complication rates from 3.7% to 10.7% (1,2,3,5,6). In our own practice we do observe immediate benefits with SK therapy. However, more frequent re-hospitalizations for post-MI Angina, re-infarction and

arrhythmia are noticed. This is considered to be due to persistence of culprit lesions with viable myocardium after SK therapy. There are some concerns regarding complications associated with SK therapy especially in a setting without interventional support. As such a comparative study was warranted in the usual CCU setting having no invasive and interventional facilities.

This study was done by reviewing the record of hospitalized patients with acute MI with reliable serial ECGs pattern and laboratory investigations.

In-hospital complications and mortality were compared including recommendations for further aggressive interventional management at suitable facility.

METHODS:

Retrospective medical record of 300 patients was reviewed with all types of acute MI admitted in our CCU between Nov. 2000 to April 2001; among them 150 patients received SK therapy and 150 patients did not receive SK therapy. 210 (70%) were males and 90 (30%) were females.

Patients who met the following criteria were included in the study:

1. History of typical pain for myocardial infarction.
2. ST-segment elevation of more than 1mm in two or more consecutive ECG leads & or Q-waves.
3. Biochemical markers.

In follow-up clinic, available data was reviewed for reported events.

RESULTS:

Out of 300 patients, 210 (70%) were male and 90 (30%) were female. 50% were given SK therapy and 50% did not receive SK therapy.

The results of success of SK therapy were judged indirectly such as relief of pain, early normalization of ECG changes, status of "R waves", early rise and fall of specific cardiac enzymes and APTT. We do not have facility for invasive diagnostic methods like

angiography, however we did offer pre-discharge ETT services but unfortunately majority of patients refused due to apprehension of complications. Most patients still believe in old fashioned strict rest for 6 weeks.

Average age was 55 years (33-77 Yr). On further break-up, 40(13%) were under 40 years, 230 (76.6%) in between 40-65 years while remaining 30 (10%) were above 65 years of age. 90 (30%) patients arrived within 3 hours after symptoms, 42 (14%) between 4-6 hours, 18 (6%) between 7-12 hours and 150 (50%) came after 12 hours (Table-I).

On risk factors analysis, cigarette smokers dominated, being 99 (33%), hypertensive 60 (20%), diabetic 42 (14%), high cholesterol/dyslipidemia in 24 (8%) and family history of ischemic heart disease in 17 (5.6%). 60 (20%) had no risk factors and 150 (50%) had 2 or more risk factors (Table-II).

Out of 300 patients, 105 (35%) suffered extensive anterior wall MI, 90 (30%) had anterior-septal MI. Cardiac enzymes were done in all patients for 3 consecutive days, 144 (48%) patients had an initial rise with early normalization of enzymes while 111 (37%) had marked rise and in 45 (15%) patients, minimal rise in cardiac enzymes was noted (Table-III).

At discharge 102 (32%) patients had normal ECG with no Q wave, 48 (16%) had preserved R wave in presence of tiny Q waves while 150 (50%) showed definite Q waves. 42 (14%) patients had reappearance of R waves (Table-IV).

During SK therapy in 150 (50%) patients, 9 (6%) patients experienced bleeding. In this group, 5 patients (3%) died due to uncontrolled bleeding. 16 (10.6%) patients had episodes of arrhythmia (Including ventricular tachycardia, ventricular fibrillation, premature ventricular contractions, atrial premature contractions, complete heart block, reperfusion arrhythmia). 12 (8%) of these died. 7 (4.7%) patients developed stroke, 3 (2%) had transit ischemia attacks, 3 (2%) suffered anaphylactic reactions and 12 (8%) developed miscellaneous complications.

Table – I

Age Groups			Duration of Chest Pain Before Hospitalization			
Under 40 Years	40-60 Years	Above 65 Yrs	Within 3 Hrs	B/W 4-6 Hrs	B/W 7-12 Hrs	After 12 Hrs
40 (13.3%)	230 (76.6%)	30 (10%)	90 (30%)	42 (14%)	18 (6%)	150 (50%)

Table – II (Risk Factors)

Risk Factors					Number of Risk Factors		
Smokers	Hypertension	Diabetes	Dyslipidemia	Family History	No Risk	One	Two or More
99 (33%)	60 (20%)	42 (14%)	24 (8%)	17 (5.6%)	60 (20%)	90 (30%)	150 (50%)

Table – III

Location of MI				Cardiac Enzymes		
Extensive Ant. Wall	Ant. Septal MI	Inferior MI	Inf. Lateral MI	Minimal Rise	Early Rise & Early Normalizations	Marked Raise
105 (35%)	90 (30%)	99 (33%)	06 (02%)	45 (15%)	144 (48%)	111 (37%)

Table – IV (ECG Changes)

SK Group			Non-SK Group	
No Q Wave	Tiny Q Wave with Preserved R-Waves	Re-appearance of R-Waves	Definite Q Wave	Poor progression of R Wave with Q Wave
102 (34%)	48 (16%)	42 (14%)	120 (40%)	30 (10%)

Following SK therapy, 3 (2%) patients developed heart block, 6(4%) developed arrhythmia, 3 (2%) developed heart failure, 7 (4%) developed Cardiogenic shock, 2 (1.33%) developed Pericarditis, 1 (0.66%) developed thromboembolic phenomenon and 12 (8.00%) patients died (Table-V).

Among patients who were not given SK therapy, 3 (2%) developed Pericarditis, 4 (2.66%) developed mechanical complications. (Table - V).

In patients without SK therapy, there were 24 (16%) deaths. In all 36 patients who died, 22 were in age group of 41-65 years. 19 patients suffered extensive anterior wall MI, 9 had inferior wall MI (Table - VI).

DISCUSSION:

Various studies have reported variable mortality and morbidity rates on SK therapy in comparison with placebo. In trails per GISSI 10.7% vs 13%; ISAM 5.9% vs 7%; ISIS 9.2% vs 12%; White 3.7% vs 12.5% and West Washington 6.3% vs 9.7%

Table – V (Complications)

Due to SK Therapy		With SK Therapy		Without SK Therapy	
Bleeding	9 (6%)	Heart Block	3 (2%)	Heart Block	5 (3.3%)
Arrhythmia	16 (10.6%)	Arrhythmia	6 (4%)	Arrhythmia	10 (6.66%)
Stroke	7 (4.6%)	Heart Failure	3 (2%)	Heart Failure	5 (3.3%)
Anaphylactic Reaction	3 (2%)	Cardiogenic Shock	7 (4.6%)	Cardiogenic Shock	12 (8%)
Miscellaneous	12 (8%)	Pericarditis	2 (1.33%)	Pericarditis	3 (2%)
Thromboem holism	-	Thromboem holism	1 (0.66%)	Thromboem holism	2 (1.3%)
Death	-	Death	12 (8.0%)	Death	24 (16%)
				Mechanical	4 (2.7%)

Table – VI (Mortality)

SK Group (150 Patients)			Non-SK Group (150 Patients)			Death and Type of MI			
Total Death (8.00%)	Male	Females	Total Death (16.00%)	Males	Females	Ext. Ants. MI	Ant. & Inf. MI	Inf. MI	Rt. Vent. MI
12	8 (5.33%)	4 (2.66%)	24	18 (12%)	6 (4%)	19 (52.8%)	5 (13.9%)	9 (25%)	3 (8.3%)

mortalities were reported on SK therapy and placebo respectively (1,2,3,5,6).

In our setup, mortality in streptokinase group was 8.00%, while in non-streptokinase population, it was 16%. This significant difference is similar to other studies (1,2,3,). Following successful Thrombolytic therapy in acute myocardial infarction, an early rise and fall in creatinine kinase level has been reported (7). This fact was observed in our patients where 48% patients showed early rise and fall.

Most of our patients experienced instant pain relief and early settling of ST-segments than in non-streptokinase group. Our unit covers the need of cardiac patients in the radius of about 400km; hence the time-scale of patients' arrival has always been a problem. Early intervention within 6 hours reduces infarct size (8). This fact is no appreciated by our population. Also they are unable to meet the time demand due to transportation and communication problems.

Rate of re-infarction and number of ischemic events are higher in streptokinase population. 25-50% of infarct related arteries remain occluded despite therapy. Higher success rate of 92% and lower occlusion rate of 4% have been observed in patients with angioplasty after thrombolysis. TAMI, 1 trial results show slightly less success rate of 73%. Identification of (10%) high risk patients can benefit from invasive interventional procedure following thrombolysis.

CONCLUSION:

As reported in other studies; with streptokinase therapy, there was a clear trend towards improvement in mortality and morbidity in this study. During hospitalization these patients had earlier relief in chest pain and less complications. They were discharged earlier without significant apprehension. By resuming their duty earlier, this group suffered less work-loss. For best results, early referral to a coronary care unit is encouraged following suspected symptoms of acute MI.

Smoking was the most prevalent major risk factor. Anti-smoking campaign should be taken up at higher level and revitalized by definite no-smoking

zones in public areas.

Among those who attended the follow-up clinic, it was noted that SK therapy patients had more events during 3 to 6 months post MI period. These unstable patients are strong candidates for further invasive/interventional procedures at suitable facility.

Unfortunately, due to lack of resources, unknown fear and logistic reasons, most patients avoid interventional procedures and continue suffering from preventable complications despite immediate benefits after SK therapy.

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