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Outcome of Patients Having Acute Myocardial Infarction with and without Streptokinase

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Abstract

Introduction: *Acute myocardial infarction is the leading cause of death. Streptokinase is the most commonly used thrombolytic agent. This study was conducted to compare in-hospital outcome of patients with acute myocardial infarction receiving streptokinase with those not receiving it.* ***Materials & Methods:*** *This descriptive observational study was conducted at Coronary Care Unit, North East Medical College Hospital from 1st July August 2016 to 30th June 2018. 340 patients having acute MI were in- cluded in the study. Two groups were formed: sk group receiving streptokinase and non-sk group not receiving. In-hospital mortality was the primary end point while mechanical and electrical complications were the secondary end points.* ***Results:*** *Among 340 patients, 255(75%) were males and 85(25%) females. Out of those 218 received strep-tokinase, while 122 did not. Mean age of sk group was 53.15±10.30 years and non-sk group 60.5±16 ears. Mean time of arrival to the hospital after symptom onset was 10.41±9.97 hours. SK group patients reached in 5.9±4.76 hours while non-sk group in 19.4±10.5 hours. In-hospital mortality in sk and non-sk group was 19(8.7%) and 25(20.5%) respectively, p=0.002. Complication rate was significantly higher in the non-sk group, 54.09% vs 34.86%, p=0.04.* ***Conclusion:*** *Patients of acute myocardial infarction receiving streptokinase have significantly lesser in-hospital mortality and complications as compared to patients not receiving it.*

Keywords: *Acute Myocardial Infarction, Streptokinase, In-Hospital Mortality.*

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Introduction

Acute myocardial infarction (AMI) is the leading cause of death[1]. Myocardial infarction results from prolonged myocardial ischemia precipitated in most cases by rupture of the pre-existing plaque leading to occlusive thrombus formation in the coronary artery[2]. The introduction of coronary care units decreased Acute MI mortality from 30% to 15%, while the use of thrombolytics further de- creased it to 5-7% [3]. Prompt reperfusion of the occluded artery through Percutaneous coronary angioplasty or thrombolytic therapy decreases the duration of occlusion leading to improved mortality [4].

Streptokinase (SK) is the most tested and commonly used thrombolytic worldwide because of its widespread availability and ability to reduce morbidity and mortality[5-7].

Despite abundant evidence in support of use of thrombolytics, approaches in its use still vary with a large number of patients still failing to receive any form of reperfusion[8]. It is partly related to delay in presentation after the onset of symptoms. The effectiveness of fibrinolytic treatment is inversely correlated with the time from the onset of chest pain to the beginning of therapy[9], there is overwhelming evidence of benefit if it is given within first hour of symptom onset, with loss of benefit over time[7].

In Bangladesh in-hospital outcome of acute MI patients treated with streptokinase has been studied in various centers[10-13], but so far no such data is available for peripheral hospital.

We designed this study to compare the in- hospital outcome of acute MI patients receiving SK with those not receiving.

Materials and Methods

This study was conducted at Coronary Care Unit, North East Medical College Hospital from 1st July August 2016 to 30th June 2018. Three hundred & forty patients were included, diagnosed as having AMI on the basis of WHO criteria. Patients presenting with Non- ST elevation MI were excluded.

The study population was divided into two groups:

1. Patients receiving streptokinase after exclusion of any contraindication.

2. Patients not receiving streptokinase because of either late presentation or the presence of any contraindication.

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Observation regarding age, gender, occupation, address, history of smoking, diabetes mellitus, hypertension, family history of ischemic heart disease and time from the symptoms onset to the hospital arrival was noted on a preformed Proforma. Thorough physical examination was carried out in all the patients. Complete blood count, fasting blood sugar, CK-MB level, serum urea, creatinine, lipid profile, chest x-ray and serial ECG's were carried out in all patients. Echocardiography was performed to look for left ventricular ejection fraction and any mechanical complications. All patients were treated as per CCU protocol[14]. Patients were followed till the discharge or death. In- hospital mortality was the primary end point while the developments of complications during the hospital stay were the secondary end points of the study.

All data was analyzed using Statistical Package for Social Sciences version 11.0. Student t test was applied to analyze continuous variables while chi-square test for the categorical ones.

Results

In 340 patients with Acute MI, 218 (64.11%) were in SK group and 122 (35.88%) in the non-SK group. For baseline characteristics in Table-I. No difference of statistical significance was observed between the two groups.

Table-I: Demographic variables of the patients.

Characteristics	SK group (N= 218)	Non SK group (N= 122)	Total (N= 340)
Age (years) Mean	53.15 ± 10.3	60.50±16.00	55.79±13.11
<45 years	59 (27.1%)	29(23.8%)	88(25.9%)
45-55 years	71 (32.6%)	32(26.2%)	103(30.3%)
<55 years	88(40.4%)	61(50.0%)	149(43.8%)
Gender Male	168(77.1%)	87(77.3%)	255(75.0%)
Female	50(22.9%)	35(28.7%)	85(25.0%)
Diabetes Mellitus	79(36.2%)	59(48.4%)	138(40.6%)
Hypertension	80(36.7%)	46(37.7%)	126(37.1%)
Smoking	133(61%)	69(56.6%)	202(59.4%)
Family history of IHD	74(33.9%)	39(32.0%)	113(33.2%)

In table II- Mean time of arrival to the hospital after symptom onset was 10.41±9.97 hours. Patients in sk group presented earlier than non-sk group, 5.9±4.76 hours' vs 19.39±10.53 hours. In non-sk group 16 (13.1%) had contraindication to thrombolytic therapy Overall in-hospital mortality was 44 (12.9%), with more deaths among patients in non-sk group 25 (20.5%) as compared to 19 (8.7%) in sk group (p=0.002).

Table-II: Characteristics of patients at presentation.

Presentation characteristics	SK Group (n=218)	Non SK Group (n=122)	Total (n=340)
Duration of chest pain (hours) Mean	5.9 ± 4.76	19.39. ± 10.53	10.41 ± 9.97
< 3 hours	65 (29.8%)	2 (1.6%)	67 (19.7%)
3-6 hours	100 (45.9%)	5 (4.1%)	105 (30.9%)
6-12 hours	34 (15.6%)	9 (7.4%)	43 (12.6%)
>12 hours	19 (8.7%)	106 (86.9%)	125 (36.8%)
ECG			
Anterior wall MI	129 (59.2%)	73 (59.8%)	202 (59.4%)
Inferior wall MI	77 (35.3%)	39 (32.0%)	116 (34.1%)
Posterior wall MI	8 (3.7%)	4 (3.3%)	12 (3.5%)
Lateral wall MI	3 (1.4%)	5 (4.1%)	8 (2.4%)
LBBB	1 (0.5%)	1 (0.8%)	2 (0.6%)
CK – MB mean (U/I)	199.9 ± 126.7	168.6 ± 85.87	186.6 ±114.6
Serum urea mean (mg/dl)	32.6 ± 21.5	47 ± 64.6	41 ± 27.3
Serum Creatinine mean (mg/dl)	0.99 ± 0.35	1.26 ± 0.87	1.06 ± 0.60

In table-III Complication rate was higher in non-sk group as compared to sk group, p=0.046. LVF was the most common complication 70 (20.6%), it was also the leading cause of death in both the groups; 13 (6%) in sk group and 13 (10.7%) in non-sk group, p<0.0001. VT/VF was the second most common complication 26 (7.6%) and the cause of death in 3 (1.4%) patients in sk and 5 (4.1%) in non-sk group, p<0.0001. Post MI angina occurred in 11 (5%) of cases in sk group as compared to 11 (9%) in non-sk group but was not statistically significant, p>0.05.

Table-III: In-Hospital outcome of patients with and without streptokinase.

Outcome measure	SK Group (n=218)	Non SK Group (n=122)	Total (n=340)	P value
In-Hospital mortality	19. (8.7%)	25. (20.5%)	44. (12.9%)	00.2
Cause of death				
Left ventricular failure	13 (6.0%)	13 (10.7%)	26 (7.6%)	
Asystole	1(0.5%)	3 (2.5%)	4 (1.2%)	0.046
VT/VF	3 (1.4%)	5 (4.1%)	8 (2.4%)	
CHB	2 (0.9%)	3 (2.5%)	5 (1.5%)	
Complications	76 (34.86%)	66(54.09%)	142(41.76)	0.040
Left ventricular failure	39(17.9%)	31 (25.4%)	70 (20.6%)	
Mitral regurgitation	3 (1.4%)	2 (2.5%)	5 (1.5%)	
VT/VF	13 6.0%)	13 (10.7%)	26 (7.6%)	
Complete heart block	7 (3.2%)	4 (3.3%)	11(3.2%)	
Atrial fibrillation	0	1(0.8%)	1(0.3%)	
Post MI angina	11(5.0%)	11 (9.0%)	22 (6.5%)	
Re-infarction	0	2 (1.6%)	2 (0.6%)	
CVA	1 (0.5%)	0	1 (0.3)	
Ventricular septal defect	2 (0.9%)	2 (1.6%)	4 (1.2%)	

Discussion

Acute myocardial infarction still remains the leading cause of death despite recent advances in its management. SK is the most commonly used thrombolytic agent worldwide. In our study the in-hospital mortality of patients with Acute MI was 8.7% in thrombolysed group and 20.5% in non-thrombolysed group. Our results are consistent with the previous studies[5,9-11,15]. In ISIS-2 the in-hospital mortality was 8% in patients receiving re perfusion as compared to 13% in the non-reperfused group[5]. Data from WIRE registry[9] showed in-hospital mortality of 9.25% in sk group which is also similar to our results. Ahmed et al[10]

reported in-hospital mortality of 10% and 19.56% in the thrombolysed and non-thrombolysed groups. In-hospital mortality in ISIS-3 trial[15] was 10.5% and 10.4% in the anistreplase and streptokinase group respectively. In-hospital mortality reported in Khurram et al[11] and French Regitary[16] was 11.5% and 9.3%, while data from GRACE [17] trial showed in-hospital mortality of 7%, which is lower than observed in our study. The reason for low mortality in GRACE study could be that 43% patients received lytic therapy alone while 57% lytic and PCI, while in our study the only reperfusion agent available was sk, which can explain the better results achieved in that trial.

Complication rate in our study was higher in non-sk group (54.09%) as compared to sk group (34.86%). LVF was the most common complication which occurred in 17.9% sk vs 25.4% non-sk group. These findings are consistent with the previous study[18]. In our study VT/VF occurred in 7.6% patients while in Tebbe et al[19] it was 26.9%. It was the second leading cause of death in our study occurring in 1.4% thrombolysed patients as compared to 4.1% non-thrombolysed patients.

A total of 64.11% patients in our study got reperfusion therapy which was similar to reported by other studies such as 68.3%, 52.08%, 68%, 47% and 62% in WIRE registry[9], Ahmed et al[10], Habib et al[12], Chaudhery et al[13], and GRACE[17] respectively.

More patients in our study presented within six hours of symptom onset in the SK receiving group than in the non-sk group (75.7% vs 5.7%). Gurwitz et al[20] reported 40% of patients presenting to hospital six hours after symptoms onset as compared to 49.4% in our study. Patients in our study reported earlier to the hospital after symptom onset than reported by Habib et al[12], mean time of arrival 10.41±9.97 hours' vs 12.4 hours by Habib et al. All the 32% patients who failed to receive thrombolysis presented after 6 hours in study by Habib et al[12] while in our study 94.3% patients in the non-sk group presented after 6 hours of symptoms onset. In our study 13.1% patients had contraindications to thrombolysis which was comparable with 15% reported in WIRE registry[9]. Patients in our study had equal chance of receiving streptokinase; patients in non- thrombolysed group either presented late or had some contraindication to thrombolysis.

Conclusion

Patients with acute myocardial infarction receiving streptokinase have significantly lesser in- hospital mortality and post MI complications as compared to those not receiving it.

Conflict of Interests: None.

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