COMPARISON OF IN-HOSPITAL OUTCOME OF PATIENTS OF MYOCARDIAL INFARCTION WITH AND WITHOUT STREPTOKINASE REPERFUSION THERAPY.

Fida Muhammad¹, Amir Nazeer², Sheraz Saleem³, Nighat Fatima⁴, Shahzad Aslam⁵

ABSTRACT... Objectives: To compare the in-hospital outcome and complications with and without reperfusion therapy with streptokinase among patients with myocardial infarction was the objective of this study. Study Design: Prospective study. Setting: Cardiology Department, Divisional Headquarter Teaching, Hospital, Sargodha. Period: March 2018 to December 2018. Material & Methods: Three hundred (300) patients with acute STEMI of either gender and above 20 years of age, were divided into two groups (180 patients received SK and 120 patients didn’t receive SK. Demographic features, history and physical examination were noted. In hospital mortality and complications were recorded and compared between groups by chi-square test. Results: There were 76.0% male and 24.0% females with mean age of 55.61±11.35 years. Family history of IHD was present in 28.34% patients and 35.0% patients were smoker. Commonest co-morbidity was hypertension (73.34%), followed by diabetes mellitus (36.67%). In-hospital mortality was 6.6% in SK group and 31.6% in non-SK group (p= <0.001). Overall, in-hospital mortality was 16.67%. LVF was 8.33% and 23.33% (p= <0.001), Mitral regurgitation 1.11% and 2.5% (p=0.848), VT/VF 3.33% and 5.83% (p=0.297), Complete heart block 2.22% and 5.83% (p=0.103), Atrial fibrillation 0.55% and 1.67% (p=0.343), Post MI angina 3.33% and 13.33% (p=0.001), Re-infarction 1.11% and 3.33% (p=0.178), CVA 0.0.55% and 0.0% (p=0.812), Ventral septal defect 0.0% and 3.33% (p=0.029) and Hypotension was 25% and 8.33% (p=0.001)in SK and non SK groups, respectively. Conclusions: Reperfusion therapy with streptokinase among patients with myocardial infarction was found effective in terms of significant low in-hospital mortality rate and low complication rate.

Key words: In Hospital Mortality, Streptokinase, Myocardial Infarction.
Cardiology Department, Divisional headquarter teaching, Hospital, Sargodha from March 2018 to December 2018. The study included 300 patients with acute myocardial infarction of either gender and above 20 years of age. Patient with acute myocardial infarction were diagnosed by raised cardiac enzymes and ST elevation on ECG. Patient with non-ST elevation MI, cardiac, hepatic and renal failure and previous arrhythmias were excluded from the study. Patients were divided into two groups.

Group I (SK Group): patients received SK (1500000/U) who reported in less than six hours because of indication to SK (n=180).

Group II (Non-SK group): patient who didn’t receive SK because of either contraindication to SK or due to late presentation (n=120).

Demographic features, history and physical examination were noted. All patients were monitored according to CCU protocol. In hospital mortality and complications were recorded and compared between groups by chi square test taking p value ≤0.05 as significant. The data was entered into SPSS version 20, computer program and analyzed accordingly.

RESULTS
Characteristics of patients are shown in Table-I. The male to female ratio was 3.1:1. The most common co-morbidity was hypertension i.e. 73.34%. In-hospital outcome of patients with and without streptokinase is shown in Table-II.

DISCUSSION
This study was conducted to compare the in-hospital outcome and complications with and without reperfusion therapy with streptokinase among patients with myocardial infarction, which included 300 cases.

| Variables                        | No. of Patients (%) |
|----------------------------------|---------------------|
| Age (years)                      |                     |
| Mean ± SD                        | 55.61±11.35         |
| Range                            | 25-60               |
| Gender                           |                     |
| Male                             | 228 (76.0%)         |
| Female                           | 72 (24.0%)          |
| Co-morbidities                   |                     |
| Diabetes mellitus                | 110 (36.67%)        |
| Hypertension                     | 220 (73.34%)        |
| Smoking                          | 105 (35.0%)         |
| Family history of IHD            | 85 (28.34%)         |

Table-I. Characteristics of patients (n=300)

| Parameters          | SK Group (n=180) | Non SK Group (n=120) | Total | P-Value |
|---------------------|------------------|----------------------|-------|---------|
| In-hospital Mortality |                  |                      |       |         |
| Left ventricular failure | 12 (6.6%)        | 38(31.6%)            | 50(16.67%) | <0.001* |
| Mitral regurgitation   | 15(8.33%)        | 28(23.33%)           | 43(14.34%) | <0.001* |
| VT/VF                | 6(3.33%)         | 7(5.83%)             | 13(4.34%) | 0.297   |
| Complete heart block  | 4(2.22%)         | 7(5.83%)             | 11(3.67%) | 0.103   |
| Atrial fibrillation    | 1(0.55%)         | 2(1.67%)             | 3(1.0%) | 0.343   |
| Post MI angina        | 6(3.33%)         | 16(13.33%)           | 22(7.34%) | 0.001* |
| Re-infarction         | 2(1.11%)         | 4(3.33%)             | 6(2.0%) | 0.178   |
| CVA                  | 1(0.55%)         | 0(0.0%)              | 1(0.34%) | 0.812   |
| Ventral septal defect | 0(0.0%)          | 4(3.33%)             | 4(1.34%) | 0.029*  |
| Hypotension           | 45(25%)          | 10(8.33%)            | 55(18.34%) | <0.001* |

Table-II. In-hospital outcome of patients with and without streptokinase (n=300)

*Significant
In our study the mean age of the patients was 55.61±11.35 years (Range: 25-60). Similarly, in a study by Taheri L et al, mean age of patients was 56.63±11.04 years. In another study by Uddin F and Hoque FAK, the mean age of patient was 55.79±13.11 years. It shows that coronary heart disease is shifting to very early age in this part of world. This similarity was also observed by Roxana Sadeghi and Nadia Adnani. There was male dominance in our study, i.e. 76.0% male with male to female ratio of 3.1:1. Similar to our study, male dominance was also observed in a study by Taheri L et al, i.e. 61.67%. In another study by Uddin F and Hoque FAK, 75.0% patients were male.

Family history of ischemic heart disease was present in 28.34% patients, in our study. In a study by Uddin F and Hoque FAK, family history of ischemic heart disease was present in 33.2% patients with acute MI. In our study, the most common co-morbidity was hypertension i.e. 73.34%, followed by diabetes mellitus i.e. 36.67%. Similarly, in a study by Taheri L et al, commonest co-morbidity was hypertension (14.7%), followed by heart ischemia (11.3%), diabetes (8.7%) and hyperlipidemia (1.0%). However, in a study by Uddin F and Hoque FAK, the most common co-morbidity was diabetes mellitus (40.6%) followed by hypertension (37.1%). In our study, 35.0% patients were smoker. However, in a study by Uddin F and Hoque FAK, 59.4% patients were smoker.

In-hospital mortality was 6.6% in SK group and 31.6% in non-SK group (p=0.001) in our study. Overall, in-hospital mortality in our study was 16.67%. However, overall higher in-hospital mortality rate i.e. 12.9% (8.7% in SK and 20.5% in non SK group; p=0.002) was observed in a study by Uddin F and Hoque FAK.

In our study, Left ventricular failure rate was 8.33% and 23.33% in SK and non SK groups (p=0.001), respectively and overall left ventricular failure was 14.34%. However, a higher overall left ventricular failure rate i.e. 20.6% (17.9% and 25.4% in SK and non SK group, respectively) was recorded in a study by Uddin F and Hoque FAK. In our study, Mitral regurgitation was observed in 1.11% and 2.5% patients in SK and non SK groups(p=0.848), respectively and overall frequency of mitral regurgitation was 1.67%. Similarly, in a study by Uddin F and Hoque FAK, overall mitral regurgitations was 1.67% (1.11% and 2.5% in SK and non SK group, respectively). In our study, 3.33% and 5.83% patients were reported with VT/VF in SK and non SK groups (p=0.297), respectively and overall frequency of VT/VF was 4.34%. However, higher VF rate was reported in a study by Taheri L et al, i.e. 8.7% and 5.3% in SK and non SK groups, respectively. In contrary to our study, overall higher VT/VF rate i.e. 7.6% (6.0% and 10.7% in SK and non SK groups, respectively) was reported in a study by Uddin F and Hoque FAK. Complete heart block was 2.22% and 5.83% in SK and non SK groups (p=0.103), respectively and overall frequency of Complete heart block was 3.67% in our study. Similarly, in a study by Uddin F and Hoque FAK, overall complete heart block was 3.2% (3.2% and 3.3% in SK and non SK groups, respectively). Atrial fibrillation was 0.55% and 1.67% in SK and non SK groups (p=0.343) respectively and overall frequency of atrial fibrillation was 1.0% in our study. In a study by Taheri L et al, atrial fibrillation was 2.7% and 2.7% in SK and non SK groups, respectively. However, overall lower atrial fibrillation frequency i.e. 0.3% (0.0% and 0.8% in SK and non SK groups, respectively) was observed in a study by Uddin F and Hoque FAK. Post MI angina was 3.33% and 13.33% in SK and non SK groups (p=0.001), respectively and overall frequency of post MI angina was 7.34% in our study. In a study by Uddin F and Hoque FAK, overall frequency of post MI angina was 6.5% (5.0% and 9.0% in SK and non SK groups, respectively). Re-infarction was 1.11% and 3.33% in SK and non SK group (p=0.001), respectively and overall re-infarction was 2.0% in our study. In a study by Uddin F and Hoque FAK, overall re-infarction was 0.6% (0.0% and 1.6% in SK and non SK groups, respectively). CVA was 0.55% and 0.0% in SK and non SK group (p=0.812), respectively and overall frequency of CVA was 0.34% in our study. Similarly, in a study by Uddin F and Hoque FAK, overall CVA was
0.3% (0.5% and 0.0% in SK and non SK groups, respectively). Ventricular septal defect was 0.0% and 3.33% in SK and non SK group (p=0.029), respectively and overall frequency of ventral septal defect was 1.34% in our study. Similarly, in a study by Uddin F and Hoque FAK, overall ventricular septal defects was 1.2% (0.9% and 1.6% in SK and non SK groups, respectively).

Hypotension was 25% and 8.33% in SK and non SK group (p=0.001), respectively and overall frequency of hypotension was 18.34% in our study. Increase incidence of hypotension in SK group was mostly reversed by giving fluids. In a study by Taheri L et al, hypotension was 10.7% and 13.3% in SK and non SK group, respectively.

This study has certain limitations. It was a single center study. Moreover, this requires a larger sample size.

**CONCLUSION**

It is concluded that Reperfusion therapy with streptokinase among patients with myocardial infarction was found effective not only in terms of low in-hospital mortality rate but also low rate of post myocardial infarction complications.

*Copyright © 17 June, 2020.*

**REFERENCES**

1. Gersh BJ. *Myocardial Infarction*. Rev Cardiovasc Med 2019; 2(3):174-6.

2. Syed U. *Reduction of ST segment elevation in diabetic patients with myocardial infarction after thrombolytic therapy*. J Ayub Med Coll 2017; 29(2):308-10.

3. Tourani S, Bashzar S, Nikfar S, Ravaghi H, Sadeghi M. *Effectiveness of tenecteplase versus streptokinase in treatment of acute myocardial infarction: A meta-analysis*. TUMJ 2018; 76(6):380-7.

4. Rezapour A, Hadian M, Ghasemi M, Vahedi S, Jafari A. *Economic evaluation of the drugs used in treating patients with myocardial infarction: A Systematic review*. JHMI 2019; 6(1):7-14.

5. Sameni M, Gholipournmalekabadi M, Bandehpour M, Hashemi M, Sahebjam F, Tohidi V, Kazemi B. *Evaluation of in vivo bioactivity of a mutated streptokinase*. NBM 2017; 5(2):71-7.

6. Usman M. *Door to needle time in acute myocardial infarction patients*. JRMC 2017; 21(2):127-30.

7. Yazdi AH, Khallilipur E, Zahedmehr A, Pouya SA, Pakrou M, Ghaznavi MA, Mikaelvand A, Rouzitalab M. *Fibrinolytic therapy with streptokinase vs tenecteplase for patients with ST-Elevation MI not amenable to primary PCI*. Iran Heart J 2017; 18(2):43-9.

8. Mathur R, Yadav P, Sanghvi S, Sarda P, Baroopal A, Mahajan S. *Evaluation of clinical outcome of thrombolytic therapy in elderly patients in Western Rajasthan: A single centre experience*. Int.J Res Med Sci 2019; 7(10):3773-7.

9. Sangaré Z, Traoré AK, Doumbia M. *Evaluation of thrombolysis in the management of St-Elevation myocardial infarction (STEMI) in isolated cardiology unit*. CardiolVasc Res 2017; 1(1):1-4.

10. Ramya NS, Narendra JB, Raghavulu V, Babu MS, Taja ND, Malini KH, Prathap SS. *Assess the clinical efficacy of streptokinase in thrombolysed patients of acute ST segment elevation myocardial infarction*. JYP 2018; 10(3):330-3.

11. Iqbal S, Bari MS, Bari MA, Islam MM, Majumder MA, Islam Z, Aditya GP, Paul GK, Shakil SS, Saha B, Paul PK. *A comparative study of ST segment resolution between diabetic and non-diabetic ST segment elevation myocardial infarction patients following streptokinase thrombolysis*. Cardiovasc J. 2019; 11(2):118-22.

12. Kumbhani DJ, Alexander T, Nallamothu BK, Menon V, Ayers C, Mullasari AS, TN-STEMI Investigators. *Pharmacoinvasive approach with streptokinase in low to intermediate risk ST-Elevation myocardial infarction patients: Insights from the tamil Nadu-STEMI initiative*. Am J Cardiovasc Drug 2019; 19(5):517-9.

13. Taheri L, Zargham-Boroujeni A, Jahromi MK, Charkhandaz M, Hojat M. *Effect of streptokinase on reperfusion after acute myocardial infarction and its complications: An ex-post facto study*. Glob J Health Sci2015; 7(4):184-9.

14. Uddin F, Hoque AF. *Outcome of patients having acute myocardial infarction with and without streptokinase*. Med Today 2019; 31(2):68-71.

15. Roxana Sadeghi, Nadia Adnani *Premature coronary heart disease and traditional risk factors* Int Cardiovasc Res J. 2013 Jun; 7(2): 46–50.
| Sr. # | Author(s) Full Name   | Contribution to the paper | Author(s) Signature |
|-------|-----------------------|---------------------------|---------------------|
| 1     | Fida Muhammad         | 1st Author                |                     |
| 2     | Amir Nazeer           | 2nd Author                |                     |
| 3     | Sheraz Saleem         | 3rd Author                |                     |
| 4     | Nighat Fatima         | 4th Author                |                     |
| 5     | Shahzad Aslam         | 5th Author                |                     |