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ACUTE MYOCARDIAL INFARCTION;

EFFECTS OF THROMBOLYSIS ON TIMI FLOW RATE IN INFARCT RELATED ARTERY (IRA) IN PATIENTS OF ST ELEVATED ACUTE MYOCARDIAL INFARCTION.

mzmbabar@yahoo.co.uk

Dr. Muhammad Zafar Majeed Babar[1], Dr. Abdul Majid[2], Dr. Javed Iqbal[3]

1. FCPS Medicine
Associate Professor of Medicine,
Sheikh Zayed Medical College/
Hospital, Rahim Yar Khan
2. FCPS Cardiology
Assistant Professor Cardiology,
Sheikh Zayed Medical College/
Hospital, Rahim Yar Khan.
3. FCPS Medicine
Associate Professor of Medicine,
Sheikh Zayed Medical College/
Hospital, Rahim Yar Khan

Correspondence:
Dr. Muhammad Zafar Majeed Babar
(FSPS Medicine)
Associate Professor of Medicine
Sheikh Zayed Medical College/
Hospital, Rahim Yar Khan
mzmbabar@yahoo.co.uk

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ABSTRACT… Objectives: To determine Post streptokinase TIMI flow grade (rate) in infarct related artery (IRA) in ST elevated myocardial infarction patients. **Study Design:** A non-randomized prospective study. **Period:** Dec-2014 to Dec-2015. **Setting:** Sheikh Zayed Medical College and Hospital Rahim Yaar Khan. **Methods:** 113 patients were selected to see post streptokinase TIMI flow grade in infarct related artery (IRA). The data was analyzed using SPSS Version 20. Descriptive statistics was used to see and analyze the data. **Results:** Mean age of patients was 50.43±9.81 years. There was more males (87.61%) as compared to females (12.39%). After thrombolyzation with streptokinase 23.01% patients were with TIMI grade 0/1 (failed perfusion), 45.13% (51) patients with TIMI grade 2 (partial perfusion) and 31.86% patients with TIMI grade 3 (full perfusion) in infarct related artery. In our study TIMI flow improved to grade 2/3 (partial to complete perfusion) in 76.99% patients. There were 11.73% patients with TIMI 0/1 with 50% ST segment resolved, 8.85% patients with TIMI 0/1 with persisted 50% ST segment, 32.74% patients with TIMI 2 with 50% ST segment resolved, 11.5% (13) patients with TIMI 2 with 50% ST segment persisted, 32.74% patients with TIMI 3 with 50% ST segment resolved and 4.42% patients with TIMI 3/1 with 50% ST segment persisted. Post streptokinase there was no coronary artery thrombus in 91.07 % patients. While 6.25% patients had thrombus in left coronary artery and 2.84% patients had right coronary artery thrombus. **Conclusion:** Thrombolyzation with streptokinase improves perfusion in infarct related artery and increases TIMI flow grade in STEMI patients. It reduces the risk of recurrent myocardial infarction by restoration of blood flow in infarct related artery.

Key words: Thrombolysis, Streptokinase, TIMI flow

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INTRODUCTION

ST segment elevation myocardial infarction, non-ST segment elevation myocardial infarction and unstable angina are included in the category of acute coronary syndrome.[1] MI occurs in about seven million people every year out of which 1/3rd die within an hour after infarction.[2] The optimal management of MI is the restoration of blood flow through the occluded artery as early patency of occluded artery has a benefit of increased survival in these patients.[3]

12- Lead electrocardiogram along with clinical symptoms provides a quick diagnosis of MI and helps us to decide which patient should be treated with thrombolysis for restoration of blood flow. Thrombolysis is routinely used to reopen the occluded artery after MI and this treatment saves 0.30% lives if treatment is provided within 6 hours after MI.[3] It is a safe, easy and cost-effective method to restore coronary perfusion.[4] For success of thrombolysis, epical vessels flow is of prime importance because microcirculatory flow is of particular importance in patient outcomes. After thrombolysis, reperfusion of infarct related artery is usually achieved in 60-80% patients within 90 minutes of thrombolysis. And TIMI III flow is achieved only in 30-55% patients. In about 5-10% of these patients culprit artery is again occluded which may result in recurrent MI and hence increased risk of mortality and morbidity.[5] This study was conducted to determine Post streptokinase TIMI flow grade (rate) in infarct related artery (IRA) in ST elevated myocardial

infarction patients.

MATERIALS AND METHODS

This was quasi experimental prospective study. The data was collected from Sheikh Zayed Medical College and Hospital Rahim Yaar Khan. The duration of study was from December 2014 to December 2015. 113 patients were included in the study. Non probability purposive sampling was used for data collection.

All ST elevated myocardial infarction patients thrombolyzed with streptokinase were included in this study. While Non ST elevated myocardial infarction patients and patients not thrombolyzed with streptokinase were excluded from the study. Electrocardiogram (ECG) was done in every patients after 90 minutes of thrombolysis to see ST segment resolution. Angiography was done in every patient 1 week after thrombolyzation to see the effectiveness of thrombolysis in terms of TIMI flow rates. A questionnaire was made to see post SK TIMI flow grade in IRA. All expected ECG changes, risk factors, complications, diagnoses, echo findings were included in the questionnaire.

Statistical analysis of data was performed using SPSS version 20. Descriptive statistics were used to see and analyses the data.

RESULTS

Out of one hundred and thirteen (113) patients, 12.39% (14) were females and 87.61% (99) were male. Mean age of patients was 50.43+9.81 years. There were 29% diabetic, 37.17% smoker, and 29.2% hypertensive patients in this study. There were 11.50% patients with positive family history of acute coronary syndrome.

There were 20.35% anterior, 13.27% were anterolateral, 18.58 %were antroseptal, 2.65% were lateral, 35.40%were inferior, 0.88%were inferolateral, 5.31% were inferoposterior, 0.88%were anteroinferior, 0.88% were posterolateral, 1.77% were posteroseptal STEMI.

There was no stenosis of left main stem artery in 90.27% patients.

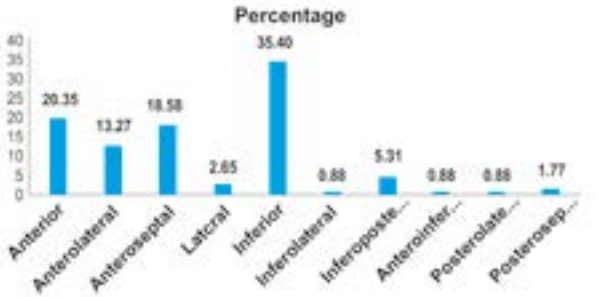

Figure-1. Types of ST Elevation Myocardial Infarction.

0.88% patients had 80-100 % stenosis, 2.65% patients had 70-80% stenosis, 1.77% patients had 50-70% and 4.42% patients had <50% stenosis in left main stem. Regarding left anterior descending (LAD) artery, 16.81% patients had no stenosis (normal vessel). 9.73% patients had 100% stenosis, 28.32% patients had 80-100% stenosis, 30.09% patients had 70-80% stenosis and 0.88% patients had 50-70% stenosis and 7.08% patients had <50% stenosis in LAD. While7.08% patients had ecstatic LAD. Regarding left circumflex artery, 51.33% Patients had no stenosis. 1.77% patients had 100% stenosis, 7.08% patients had 80–100% stenosis, 18.58% patients had 70-80% stenosis, 5.31% patients had 50-70% stenosis and 10.62% patients had <50% stenosis in LCX. 5.31% patients had ectatic LCX. 35.45% Patients had no stenosis in right coronary artery (RCA). 9.73 % patients had 100% stenosis, 15.04% patients had 80-100% stenosis, 16.81% patients had 70-80% stenosis, 6.91% patients had 50-70% stenosis and 10.62% patients had <50% stenosis in RCA.

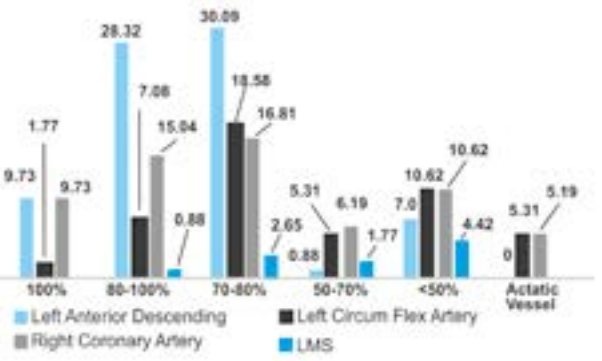

Figure-2. Percentage Stenosis of Individual Vessels.

In present study 23.01% (26) patients were with TIMI grade 0/1, 45.13% (51) patients with TIMI grade 2 and 31.86 % (36) patients with TIMI grade

3. In our study TIMI flow improved to grade 2/3 in 76.99% patients. There were 9.73% (11) patients with TIMI 0/1 with 50% ST segment resolved, 8.85% (10) patients with TIMI 0/1 with persisted 50% ST segment, 32.74% (37) patients with TIMI2 with 50% ST segment persisted, 32.74% (37) patients with TIMI III with 50% ST segment resolved and 4.42% (5) patients with TIMI II with 50% ST segment TIMI III with 50% ST segment persisted resolved, 11.4% (13) patients. In present study 43.36% patients had single vessel disease, 49.56% patients had double vessel and 7.08% patients had triple vessel disease. In 75.22% patients up to 50% decrease in ST segment elevations and 24.78% patients were without 50% decrease in ST elevation observed after 90 minutes of thrombolysation with streptokinase. Post streptokinase there was no coronary artery thrombus in 91.07 % patients. while 6.25% patients had thrombus in left coronary artery and 2.84% patients had right coronary artery thrombus.

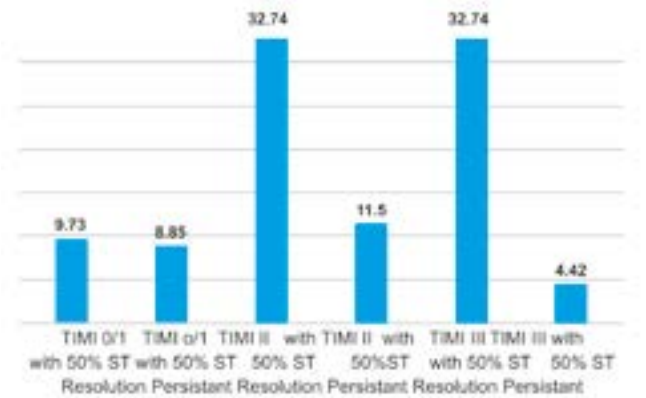

Figure-3. Relationship of TIMI Flow with 50% ST Resolution

DISCUSSION

This prospective study was designed to assess feasibility and potential benefits of treatment (thrombolyzation) with the streptokinase in patients of STEMI. Thrombolyzation with the streptokinase improves epicardial flow and coronary microcirculatory function. In our study 23.01% (26) patients were with TIMI grade 0/1, 45.13% (51) patients with TIMI grade 2 and 31.86 % (36) patients with TIMI grade 3. In our study TIMI flow improved to grade 2/3 in 76.99% patients. White Trails supports our study .White trails 73% patients were in TIMI 2/3 while 27% patients seen in TIMI 0/1.[6]

According to Simoons study, 90 minutes arterial patency rate after streptokinase was achieved in 50%–60%, and TIMI grade 3 flow was only achieved in 30% of the patients.[7] According to Bhalla study TIMI 3 flow was achieved in 45% to 47% of patients[8] and Andrews study documented that post streptokinase therapy, 28% had TIMI 0 to 1 flow, 30% TIMI 2 flow, and 42% TIMI 3 flow.[9] TIMI 3 flow was achieved in 38% of patients at streptokinase in Elliot study.[10]

As ST resolution is a useful and dependable marker for estimating micro-vascular perfusin. In present study, up to 50% ST-segment resolution was observed in 75.22% patients. According to de Lemon study there is complete ST segment resolution in 50% of patients treated wih streptokinase.[11] In our study when we compared TIMI flow with up to 50% ST segment resolution then ,there were 9.73% (11) patients with TIMI 0/1 with 50% ST segment resolved, 8.85% (10) patients with TIMI 0/1 with persisted 50% ST segment, 32.74% (37) patients with TIMI 2 with 50% ST segment resolved, 11.4% (13) patients with TIMI 2 with 50% ST segment persisted, 32.74% (37) patients with TIMI 3 with 50% ST segment resolved and 4.42% (5) patients with TIMI 3 with 50% ST segment persisted. Study of Sultana proved that 19% patients with TIMI 0/1 with ST segment resolved, 25% patients with TIMI 0/1 with persisted ST segment, 13.7%patients with TIMI 2 with ST segment resolved, 21.5% patients with TIMI 2 with ST segment persisted, 22% patients with TIMI 3 with ST segment resolved and 9.25% patients with TIMI 3 with ST segment persisted.[12] Above mentioned studies took complete ST resolution with TIMI flow grade while in present study up to 50% ST resolution (partial ST segment resolution) with TIMI flow grade was taken. It might be the reason for difference in results mentioned above The Reason of variation between our study and previous study results was due to the assessment of angiographic end point TIMI grading. Variability in the visual assessment of this end point hampers comparisons of flow data between thrombolytic agents and between trials because in addition to its subjective type the conventional flow-grading system is also categorical in nature.

CONCLUSION

Thrombolyzation with streptokinase improves perfusion in infarct related artery and increases TIMI flow grade in STEMI patients. It reduces the risk of recurrent myocardial infarction by restoration of blood flow in infarct related artery.

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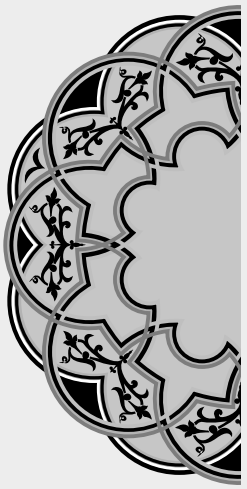

"Adversity causes some men to break, and others to break records."

Unknown

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. M. Zafar Majeed Babar	Conceived, Design and wrote the manuscript	
2	Dr. Abdul Majid	Did data collection, helped in writing the manuscript	
3	Dr. Javed Iqbal	Helped in statistical analysis and designing the research Methodology, Review the mnuscript	