

Outcome of Thrombolytic Therapy in Acute Coronary Syndrome in Diabetic versus Non-Diabetic Patients

Seema Seth¹, Kamlesh Taori², Mahendra Sharma³

¹Associate Professor, MD Medicine, Rohilkhand Medical College, Bareilly

²Junior Resident, MD Medicine, Rohilkhand Medical College, Bareilly

³Statistician, Dept of Community Medicine, Rohilkhand Medical College, Bareilly

Corresponding Author: Kamlesh Taori

ABSTRACT

Introduction: Diabetes mellitus (DM) has emerged as a modern epidemic and is at raising trend globally and will continue to be in future. Also, Acute Coronary Syndrome (ACS) is one amongst the major causes of mortality and morbidity globally. The mortality in diabetics is nearly twice as that of non-diabetic. Thus, this study was carried to compare the outcome of thrombolytic therapy in acute coronary syndrome in diabetic versus non-diabetic patients.

Objective: To compare the outcome of thrombolytic therapy in acute coronary syndrome in diabetic versus non-diabetic patients.

Material and Method: Prospective observational study was undertaken in Rohilkhand Medical College and Hospital, Bareilly including 50 patients presented with ACS admitted in the medical wards from 1st Jan 2018 to 31st Dec 2018. Detailed clinical examination and routine investigations were done. These patients were treated with streptokinase as a thrombolytic agent. ECG was taken on admission and the one after 60 minutes of thrombolysis. The study groups were divided in two i.e. diabetic and non-diabetics. Data was collected, computed and analyzed statistically.

Results: 50 cases were enrolled in the study, out of which 31 were male and 19 were female. Two study groups were made one of diabetic and other of non-diabetic for comparison each of 25 cases. Resolution of ST-segment in non-diabetic patients was found in 17 patients out of 25 and in diabetics it was found in patients 11 out of 25. Post fibrinolytic therapy complications were more prevalent in diabetics as compared to those in non-diabetics. Mortality

was 12% with diabetics as compared to 4% mortality in non-diabetics.

Conclusion: A considerable number of diabetics failed achieve complete reperfusion after thrombolytic therapy, despite the established fact that fibrinolytic therapy benefits in acute myocardial infarction. The mortality and morbidity was more in diabetic when compared with non diabetic after thrombolytic therapy in ACS in our study. Complications after fibrinolytic therapy were more prevalent in diabetics. Thus, one must be aware about this fact and special attention must be given for the better management and care of diabetic myocardial infarction patients.

Keywords: thrombolytic therapy, acute coronary syndrome, diabetic versus non-diabetic patients.

INTRODUCTION

Globally approximately 194 million adult cases of type 2 diabetes are prevalent and the expected number may increase to 333 million by 2025. In India, there are approximately 33 million diabetics in India and the number expected to reach 79.4 million by 2030. ^[1]

Acute coronary syndrome (ACS) is any group of clinical symptoms compatible with myocardial ischemia and covers the spectrum of clinical conditions ranging from unstable angina, non ST segment elevation myocardial infarction (NSTEMI) and ST segment elevation MI (STEMI). ^[2] Compared to non-diabetics, persons having diabetes are two to four fold increased risk of development of and death from Coronary Artery Disease (CAD). ^[3]

Diabetes Mellitus is a metabolic disorder in which there is acceleration in atherosclerotic rate of vascular occlusion. [4] A timely and prompt thrombolysis does ensure a favorable outcome of patients with diabetes as compare to non diabetes implies that the cardiac function is impaired after thrombolysis thus leading to a poor prognosis. ECG being simple, cheap and widely available, way for judging myocardial recovery and salvage; it is important to establish the importance and effectiveness of ECG for assessment of reperfusion.

Due to advancement in field medical sciences both in pharmacological (thrombolysis) and revascularization therapy, the all over survival in ST-elevation myocardial infarction (STEMI) patients has considerably improved in last two decades. [9] Presently physician's focus is shifting on subsets whose outcome after MI is still disappointing and mortality rate remains high. Poor prognosis is associated in patients those who are diabetics. However, management guideline of STEMI currently does not focus much attention on diabetes. Therefore, in this study was planned in view to provide a framework of reference to raise awareness among physician in patients with diabetics having STMI, so as to improve the outcomes of patients of STEMI in diabetics.

This study was carried out to compare the outcome of thrombolytic therapy in acute coronary syndrome in diabetic versus non-diabetic patients.

MATERIAL AND METHOD

Prospective observational study was undertaken in Rohilkhand Medical College and Hospital, Bareilly including 50 patients presented with ACS admitted in the medical wards from 1st Jan 2018 to 31st Dec 2018.

Detailed history and clinical examination was performed and laboratory investigations were done after explaining the nature of study and informed written consent taken from the patients. The following investigations were done:

- Blood glucose: FBS, PPBS
- Renal function tests
- Electrolytes
- Glycosylated hemoglobin (HbA1c)
- Fasting Lipid profile
- Urine routine and microscopy
- Electrocardiography(ECG)
- Fundoscopy
- Chest x-ray
- Echocardiography
- Cardiac enzymes like CPK-MB

The patients having anterior-lateral wall MI were only included in study. These patients were treated with streptokinase as a thrombolytic agent. Streptokinase was administered as 1.5 million units (MU) intravenously over 45min-1 hour. ECG was taken on admission and the one after 60 minutes of thrombolysis and latter if required. The study groups were divided in two i.e. diabetic and non-diabetics. Data was collected, computed and analyzed statistically.

RESULTS

50 cases were enrolled in the study, out of which 31 were male and 19 were female. Two study groups were made one of diabetic and other of non-diabetic for comparison each of 25 cases. Resolution of ST-segment in non-diabetic patients was found in 17 patients out of 25 and in diabetics it was found in patients 11 out of 25.

Table 1 : Complication and Mortality in Diabetic v/s Non-Diabetics

Complications	Diabetic	Non-Diabetic	p- Value
Arrhythmia	4	1	<0.001*
Heart Failure	4	1	<0.001*
Chest Pain	5	8	0.053
Hypotension	6	2	0.002*
Hemorrhagic manifestation	3	1	0.037*
Death	3	1	0.037*

*is statistically significant using Chi Square test

Post fibrinolytic therapy complications were more prevalent in diabetics as compared to those in non-diabetics. Post fibrinolytic complications were arrhythmia, heart failure, chest pain

and few others. Arrhythmia, heart failure, hypotension and hemorrhagic manifestation were more in diabetic after fibrinolytic therapy and were found statically significant. However complication like chest pain had no statically significance,

reason for this might be because many diabetic patients undergo silent MI [10] and complication of chest pain also is less after fibrinolytic therapy in diabetic as compare to non diabetic.

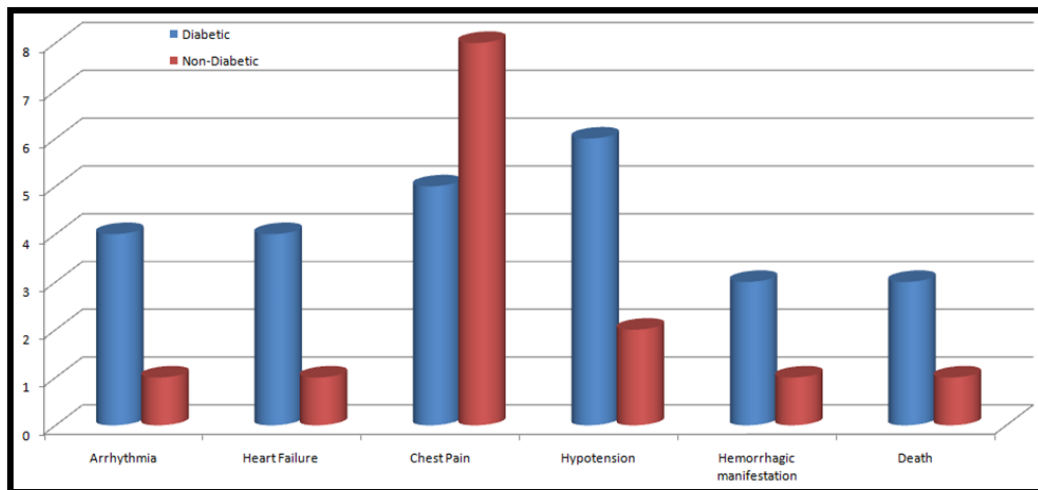


Fig. 1 : Complication and mortality in Diabetic vs Non- Diabetics

Mortality was 12% with diabetics as compared to 4% mortality in non-diabetics which was statically significant.

DISCUSSION

The success of fibrinolysis depends on the time taken to reperfusion patient after presentation and completion of reperfusion. Ideally in a case without any contraindications for fibrinolysis (see below), fibrinolytic therapy must be initiated within 30 min of presentation (i.e., door to-needle time ≤ 30 min). The principal goal of fibrinolysis is prompt restoration of full coronary arterial patency. The fibrinolytic agents like tissue plasminogen activator, streptokinase, tenecteplase, reteplase and streptokinase have been approved by the U.S. Food and Drug Administration for intravenous use in patients with STEMI.

Role of intravenous streptokinase during acute myocardial infarction is a well recognized and is accepted as effective treatment measure. However, clear contraindications to the use of fibrinolytic agents include a history of cerebrovascular hemorrhage at any time, a non-hemorrhagic

stroke or other cerebrovascular event within the past year, marked hypertension in an time during the acute presentation, suspicion of aortic dissection, and active internal bleeding (excluding menses). [5] Streptokinase was administered as 1.5 million units (MU) intravenously over 45min to 1 hour. ECG was taken on admission and the one after 60 minutes of thrombolysis and later as required.

ST-segment resolution suggests successful reperfusion, in cases of STEMI. Resolution of ST-segment in non-diabetic patients was found in 17 patients out of 25 and in diabetics it was found in patients 11 out of 25. A considerable number of diabetics failed achieve complete reperfusion after thrombolytic therapy, despite the established fact that fibrinolytic therapy benefits in acute myocardial infarction. The mortality and morbidity was more in diabetic when compared with non diabetic after thrombolytic therapy in ACS in our study. Post fibrinolytic therapy complications were more prevalent in diabetics as compared to those in non-diabetics.

The study by Timmer JR et al, concluded that increased 30-day mortality was more in diabetics when compared with non diabetics after MI. [6] In study by Gray RP et al observed that residual lesion in the infarcted artery was more in diabetics post fibrinolytic therapy compared to non diabetics; thus resulting in higher rate of recurrent ischemia. [7]

In post myocardial infarction heart failure is one of the significant prognostic factors. In our study, heart failure was more prevalent with diabetic when compared to non-diabetic. In study by Hasdai D et al, observed that in-hospital heart failure in diabetics was more prevalent. [8] Other complications after fibrinolytic therapy were also more prevalent in diabetics when compared to non diabetics.

Limitation of the study was that the sample size was small and more studies are required with the large sample. Study was selection biased as it was conducted in a hospital, due to limited resources and time constrain a general population based study was not possible. The study can not be extrapolated on the general population.

CONCLUSION

A considerable number of diabetics failed achieve complete reperfusion after thrombolytic therapy, despite the established fact that fibrinolytic therapy benefits in acute myocardial infarction. The mortality and morbidity was more in diabetic when compared with non diabetic after thrombolytic therapy in ACS in our study. Complications after fibrinolytic therapy were more prevalent in diabetics. Thus, one must be aware about this fact and special attention must be given for the better management and care of diabetic myocardial infarction patients.

REFERENCES

1. World Health Organisation. Addressing health inequalities in Indonesia, 2017. Available at <http://www.who.int>.

2. Kumar A, Cannon CP. Acute coronary syndromes: diagnosis and management, part I. *Mayo Clin Proc* 2009; 84:917-38.
3. Preis SR, Hwang SJ, Coady S, et al. Trends in all cause and cardiovascular disease mortality among woman and men with and without diabetes mellitus in the Framingham heart Study, 1950 to 2005. *Circulation*. 2009; 119:119-123
4. Bajzer CT. Acute myocardial infarction. In: *Medicine index. Cleveland Clinic Foundation* 2002; 222-6.
5. Kasper DL, Fauci AS, Hauser SL, Longo DL, Jamesone JL, Loscalzo J. Harrison 's principles of internal medicine (20th edition) New York : McGraw Hill Education 2018;2: 1879
6. Timmer JR, Ottervanger JP, De boer M, Bocrsma E, Grines CL, Westerhout CM. Primary percutaneous coronary intervention compared with fibrinolysis for myocardial infarction in diabetes mellitus: result from the primary coronary angioplasty vs thrombolysis-2 trial. *Arch Intern Med* 2007; 167:1353-9.
7. Gray RP, Yudkin JS, Patterson DL. Enzymatic evidence of impaired reperfusion in diabetic patients after thrombolytic therapy for acute myocardial infarction. *BrHeart J* 1993; 70:530-6
8. Hasdai D, Granger CB, Srivatsa SS, Crigor DA, Ellis SG, Gliff RM, et al. Diabetes mellitus and outcome after primary coronary angioplasty for acute myocardial infarction: lessons from the GUSTO-IIb Angioplasty Substudy. [Global Use of Strategies to Open Occluded Arteries in Acute Coronary Syndromes]. *J Am CollCardiol* 2000; 35:1502-12. Vol. 61, No. 10, October 2011 1036
9. Meier P, Lansky AJ, Baumbach A. Almanac 2013: acute coronary syndromes. *Heart*. 2013; 99: 1488-1493.
10. Kasper DL, Fauci AS, Hauser SL, Longo DL, Jamesone JL, Loscalzo J. Harrison's principles of internal medicine (20th edition) New York : McGraw Hill Education 2018;2: 1863

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