

ORIGINAL RESEARCH

Comparative evaluation of complications and mortality in ST-segment elevation acute myocardial infarction (STEMI) in diabetic and non-diabetic patients

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ABSTRACT

Background: *Diabetes is a universal problem and is becoming a major concern at old age especially in obese people and in people with sedentary life style. The present study was conducted to assess complications and mortality in ST-segment elevation acute myocardial infarction in diabetic and non-diabetic patients.*

Materials & Methods: *160 consecutive patients of diabetic (group I) and non-diabetic (group II) having acute ST-segment elevation myocardial infarction (STEMI) of both genders were included. Treatment was given to all patients.*

Results: *Age group <44 years had 15 diabetic and 10 non-diabetic, 45-54 years had 25 diabetic and 12 non-diabetic, 55-64 years had 10 diabetic and 20 non-diabetic and >65 years had 40 diabetic and 28 non-diabetics. The site was anterior in 26 and 20, inferior in 38 and 40, inferior+ right ventricular in 20 and 10 and lateral in 6. Mortality was seen in those in which streptokinase was given in 7 and 3 and streptokinase not given in 15 and 10 in group I and group II respectively (P< 0.05).*

Conclusion: *With streptokinase administration there was reduction in mortality in diabetic as well as in non-diabetic. However, diabetics not on streptokinase had higher mortality as compared to non-diabetics.*

Key words: *Diabetes, STEMI, streptokinase*

INTRODUCTION

Acute myocardial infarction (AMI) is one of the leading causes of all acute emergencies and is becoming an important public health problem in the developing countries. Diabetes is a universal problem and is becoming a major concern at old age especially in obese people and in people with sedentary life style.¹

Worldwide the number of people diagnosed with diabetes mellitus is increasing rapidly. Diabetes is associated with a two- to four-fold increase in the risk of developing CHD, and cardiovascular diseases are the major cause of death among diabetic persons.² It remains controversial whether diabetic persons have a similar risk of developing acute CHD events as non-diabetic patients who have suffered a prior myocardial infarction (MI).³ Diabetes mellitus is a major risk factor for cardiovascular disease in general and for coronary heart disease in particular. Furthermore, the recent National Cholesterol Education Programme III guidelines have elevated diabetes to a coronary disease risk equivalent. Among patients with diabetes who survived myocardial infarction (MI), less is known about subsequent morbidity and mortality.⁴

In patients with AMI, heart failure is characterized by diastolic dysfunction alone or systolic and diastolic dysfunctions together. About 3% of the adult patients develop systolic dysfunction which recognized by echocardiography and is asymptomatic in about of them. Re-infarction is diagnosed by persistent and typical severe chest pain along with re-elevation

of ST-segment and increased concentrations of cardiac markers in the blood.⁵ The present study was conducted to assess complications and mortality in ST-segment elevation acute myocardial infarction in diabetic and non-diabetic patients.

MATERIALS & METHODS

The present study comprised of 160 consecutive patients of diabetic (group I) and non-diabetic (group II) having acute ST-segment elevation myocardial infarction (STEMI) of both genders.

Demographic data was recorded. A 12-lead ECG of each patient was recorded. The patients were divided into four groups on the basis of ST-segment elevation in different leads. ST-segment elevation in leads V1-V6 (anterior AMI), in II, III, aVF (Inferior AMI), in II, III, aVF+ V4R (Inferior + Right ventricular AMI) and in I, aVL, V5, V6 (Lateral AMI). 5 ml blood sample was collected and analysed for serum CK and CK-MB and Trop-T level. Treatment was given to all patients. Results were compiled and assessed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Diabetic (90)	Non- diabetic (70)	P value
<44	15	10	0.01
45-54	25	12	
55-64	10	20	
>65	40	28	

Table I shows that age group <44 years had 15 diabetic and 10 non- diabetic, 45-54 years had 25 diabetic and 12 non- diabetic, 55-64 years had 10 diabetic and 20 non- diabetic and >65 years had 40 diabetic and 28 non- diabetics. The difference was non- significant ($P < 0.05$).

Table II Comparison of parameters

Parameters	Variables	Group I	Group II	P value
Site	Anterior	26	20	0.05
	Inferior	38	40	
	Inferior+ right ventricular	20	10	
	Lateral	6	0	
Mortality	Streptokinase given	7	3	0.01
	Streptokinase not given	15	10	

Table II, graph I shows that site was anterior in 26 and 20, inferior in 38 and 40, inferior+ right ventricular in 20 and 10 and lateral in 6. Mortality was seen in those in which streptokinase was given in 7 and 3 and streptokinase not given in 15 and 10 in group I and group II respectively ($P < 0.05$).

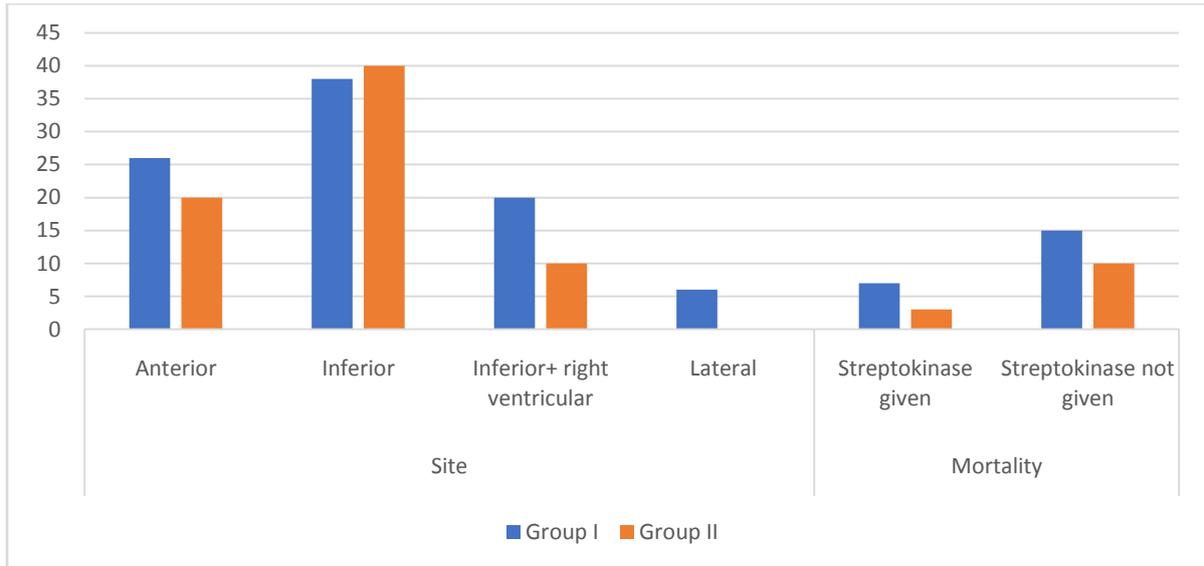
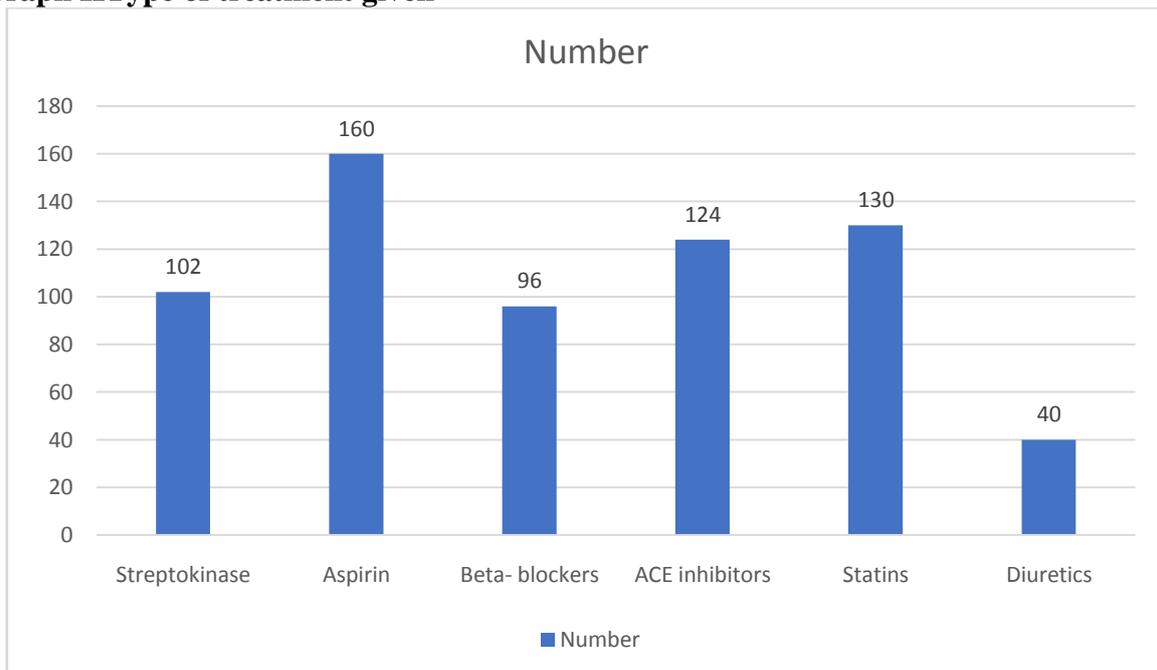


Table III Type of treatment given

Treatment given	Number	P value
Streptokinase	102	0.01
Aspirin	160	
Beta- blockers	96	
ACE inhibitors	124	
Statins	130	
Diuretics	40	

Table III, graph II shows that type of treatment given was streptokinase in 102, aspirin in 160, beta- blockers in 96, ACE inhibitors in 124, statins in 130 and diuretics in 40 patients. The difference was significant ($P < 0.05$).

Graph II Type of treatment given



DISCUSSION

Diabetes is associated with a marked increase (by a factor of two to four) in the risk of coronary heart disease. Clinically established coronary heart disease itself is associated with an increase in mortality from coronary heart disease by a factor of three to seven, depending on the mode of presentation.⁶ The plasma cholesterol level is a strong predictor of the risk of cardiovascular events both in patients with diabetes and in patients with coronary heart disease.⁷ The high-risk status of these groups of patients and their need for more aggressive lipid-lowering therapy have been recognized by both the National Cholesterol Education Programme and the American Diabetes Association.⁸ The reduction in plasma lipids recommended by the National Cholesterol Education Programme is greater for patients with coronary heart disease than for patients with diabetes.⁹ However, there were differing opinions among members of the National Cholesterol Education Programme panel, with some suggesting that diabetic patients should have the same intensity of cholesterol-lowering therapy as patients with coronary heart disease. Thus, there is controversy about how aggressively to treat cardiovascular risk factors in patients with diabetes. It has been suggested that such patients should be treated as if they had established coronary heart disease.¹⁰ The present study was conducted to assess complications and mortality in ST-segment elevation acute myocardial infarction in diabetic and non-diabetic patients.

In present study, age group <44 years had 15 diabetic and 10 non-diabetic, 45-54 years had 25 diabetic and 12 non-diabetic, 55-64 years had 10 diabetic and 20 non-diabetic and >65 years had 40 diabetic and 28 non-diabetics. Iqbal et al¹¹ in their study complications of acute myocardial infarction (AMI) and the outcome were compared between diabetics and non-diabetic patients. Different complications studied varied significantly within diabetics, non-diabetics and in overall after controlling for diabetes. Complications showed similar pattern (heterogeneity test $P > 0.5$) in diabetic and non-diabetic patients. The abnormalities including Cardiogenic shock, left ventricular failure (OR = 2.5), re-infarction (OR = 2.2), arrhythmia (OR = 2.04) and ventricular septal defect (OR = 2.17) were 4.2, 4.7, 21.3, 4.2 and 85.24 times higher in diabetics, respectively. However, occurrence of post myocardial angina was low in diabetics than non-diabetics. Odds of having diastolic dysfunction were 1.8 times higher in diabetic patients. The moderate and severe LV-dysfunction was 3.3 and 2.5 times higher in diabetics, while mild LV-dysfunction was 2.1 times higher in non-diabetics. Mortality due to STEMI in diabetics was 2.3 times higher than in non-diabetics. Mortality varied significantly between different age groups in non-diabetics and in overall after controlling for diabetes. In non-diabetic group, mortality was 8.4 times higher in patients those were not given streptokinase than those were given streptokinase, while in diabetic group it was 2.5 times higher in patients were not given streptokinase than those were given streptokinase. The results indicate that the diabetics have higher risk of mortality.

We found that site was anterior in 26 and 20, inferior in 38 and 40, inferior+ right ventricular in 20 and 10 and lateral in 6. Mortality was seen in those in which streptokinase was given in 7 and 3 and streptokinase not given in 15 and 10 in group I and group II respectively. We found that type of treatment given was streptokinase in 102, aspirin in 160, beta-blockers in 96, ACE inhibitors in 124, statins in 130 and diuretics in 40 patients. Haffner et al¹² compared the seven-year incidence of myocardial infarction (fatal and nonfatal) among 1373 nondiabetic subjects with the incidence among 1059 diabetic subjects. The seven-year incidence rates of myocardial infarction in nondiabetic subjects with and without prior myocardial infarction at base line were 18.8 percent and 3.5 percent, respectively ($P < 0.001$). The seven-year incidence rates of myocardial infarction in diabetic subjects with and without prior myocardial infarction at base line were 45.0 percent and 20.2 percent, respectively ($P < 0.001$). The hazard ratio for death from coronary heart disease for diabetic subjects without prior myocardial infarction as compared with nondiabetic subjects with prior

myocardial infarction was not significantly different from 1.0 (hazard ratio, 1.4; 95 percent confidence interval, 0.7 to 2.6) after adjustment for age and sex, suggesting similar risks of infarction in the two groups.

CONCLUSION

Authors found that with streptokinase administration there was reduction in mortality in diabetic as well as in non-diabetic. However, diabetics not on streptokinase had higher mortality as compared to non-diabetics.

REFERENCES

1. Savage MP, Krolewski AS, Kenien GG, Lebeis MP, Christlieb AR, Lewis SM. Acute myocardial infarction in diabetes mellitus and significance of congestive heart failure as a prognostic factor. *Am J Cardiol.* 1988;62:665-669.
2. Jaffe AS, Spadaro JJ, Schechtman K, Roberts R, Geltman EM, Sobel BE. Increased congestive heart failure after myocardial infarction of modest extent in diabetes mellitus patients. *Am Heart J.* 1984;108:31-37.
3. Stone PH, Muller JE, Hartwell T, et al; MILIS Study Group. The effect of diabetes mellitus on prognosis and serial left ventricular function after acute myocardial infarction: contribution of both coronary disease and diastolic left ventricular dysfunction to the adverse prognosis. *J Am Coll Cardiol.* 1989;14:49-57.
4. Granger CB, Califf RM, Young S, et al; Thrombolysis and Angioplasty in Myocardial Infarction (TAMI) Study Group. Outcome of patients with diabetes mellitus and acute myocardial infarction treated with thrombolytic agents. *J Am Coll Cardiol.* 1993;21:920-925.
5. Rytter L, Troelsen S, Beck-Nielsen H. Prevalence and mortality of acute myocardial infarction in patients with diabetes. *Diabetes Care.* 1985;8:230-234.
6. Czyzk A, Krolewski AS, Szablowska S, Alot A, Kopczynski J. Clinical course of myocardial infarction among diabetic patients. *Diabetes Care.* 1980;3:526-529.
7. Tansey MJ, Opie LH, Kennelly BM. High mortality in obese women diabetics with acute myocardial infarction. *BMJ.* 1977;1:1624-1626.
8. Kouvaras G, Cokkinos D, Spiropoulou M. Increased mortality of diabetics after acute myocardial infarction attributed to diffusely impaired left ventricular performance as assessed by echocardiography. *Jpn Heart J.* 1988;29:1-9.
9. Lomuscio A, Castagnone M, Vergani D, et al. Clinical correlation between diabetic and non-diabetic patients with myocardial infarction. *Acta Cardiol.* 1991; 46:543-554.
10. Yudkin JS, Oswald GA. Determinants of hospital admission and case fatality in diabetic patients with myocardial infarction. *Diabetes Care.* 1988;11:351-358.
11. Iqbal MJ, Javed MT, Tahira I. Complications and mortality in ST-segment elevation acute myocardial infarction in diabetic and non-diabetic patients. *Medical Journal of Islamic World Academy of Sciences.* 2011;19(2):87-94.
12. Haffner SM, Lehto S, Rönnemaa T, Pyörälä K, Laakso M. Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. *New England journal of medicine.* 1998 Jul 23;339(4):229-34.