

Frequency and Short Term Survival of Acute Myocardial Infarction Patients with Diabetes Mellitus

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ABSTRACT

Objective: To assess frequency and survival of AMI patients with diabetes mellitus.

Study Type: Prospective observational study.

Study Place and Duration: DG Khan Medical College & DHQ Teaching Hospital, DG Khan, from 1st June 2020 to 30th May 2021.

Material and methods: The study comprised instances of Type II diabetes mellitus that required admission in the hospital due to ST elevation myocardial infarction and met the other criteria. Electrocardiogram (ECG) 6 hourly, cardiac enzymes on arrival, repeated at two, four, eight, twelve, and twenty four hours, and Troponin T fast assay are among the tests performed. On the basis of the above-mentioned work-up, the definitive diagnosis was made within 48 hours for acute myocardial infarction after admission. The HbA1c level and blood glucose level were also checked to determine the diabetic state.

Results: Overall 366 diabetes patients with AMI were studied. Out of these, 269 (73.5%) were males and 97 (26.5%) were females. The mean age of the patients was 44.86±12.26 years. Inferior wall MI was found in (33.3%) patients and left ventricle dysfunction was found in (21.6%) patients. CK-MB and troponin T enzyme was found in raised diabetes patients, (51.9%) and (90.7%), respectively. n=44 (12.0%) deaths were reported in 1-10 days, n=43 (11.7%) deaths were reported in 11-20 days and n=51 (13.9%) deaths were reported in 21-30 days.

Conclusion: In current study it was concluded that in patients with diabetes mellitus, the short term mortality increases.

Keywords: Frequency, Short term, Acute Myocardial Infarction (MI), Diabetes Mellitus(DM), Mortality, Shortness of Breath, Chest Pain

INTRODUCTION

Diabetes mellitus is a collection of metabolic illnesses defined by hyperglycemia caused by defective insulin secretion, action, or both (1). By 2025, global prevalence of diabetes mellitus is anticipated to climb to 300 million (2). The prevalence of DM was found to be 19% of 5433 people done in Pakistan (4) and is related to an increased risk of MI and sudden death (5).

In diabetics with MI rate of mortality, death, and re-infarction are higher as compared to non-diabetic with MI, with one-year mortality as 50% in this group (6). Also, in the past, the acute and long-term effectiveness of reperfusion techniques has been lower in diabetic individuals (7, 8). Around 10 to 30% patients having Type II diabetes also have MI which is a serious public health issue (9). The risk profile of a diabetic patient is worse than non-diabetic (10, 11).

The mortality rate of diabetic patients (2.9%) during hospitalization is higher than non-diabetics (2.0%) (12). Studies assessed how short term prognosis is affected by diabetes after acute MI (13, 14). Most of the data demonstrate that the mortality rate of patients with diabetes having acute MI is higher than non-diabetic patients with acute MI (15, 16). Post-myocardial infarction diabetic patients have mortality rates that range from 10.5 to 40%, and are 40 to 100% greater than post MI non-diabetic patients (17). The goal of this current study was to assess the frequency of acute MI in people with Type II DM, as well as the short-term survival rate of acute MI in people with Type II DM.

MATERIAL AND METHOD

This is a prospective observational study done in DG Khan Medical College & DHQ Teaching Hospital, DG Khan, from June 2020 to May 2021. Sample Size was 366 cases of Type II diabetes mellitus calculated using the reference study by Soomro et al. (17). The nonprobability purposive sampling approach was applied. Already or newly diagnosed diabetic patients with acute AMI, of any age and gender that required admission in the hospital due to ST elevation myocardial infarction were included. Cases with a prior history of acute MI, congenital Heart Diseases, Congestive Chronic HF, valvular Heart Diseases, Coronary Angioplasty, cases with Type 1 and gestational diabetes, and cases that did not agree to written consent for participation were all excluded from the study.

After describing the study's aim to each patient or their attendant, they gave their informed permission. The history was obtained, a clinical examination was performed and baseline investigations were completed. ECG six hourly, cardiac enzymes on arrival, repeated at two, four, eight, twelve, and twenty four hours, and Troponin T fast assay are among the tests performed. The definitive diagnosis of AMI was made within forty eight hours after admission. The HbA1c level and blood glucose level were also checked to determine diabetic state. Software version 10.00 i.e. SPSS was used to enter and examine all of the data.

RESULTS

Over the study period, 366 diabetes patients with AMI were studied. Out of these, 269 (73.5%) were males and 97 (26.5%) were females. The mean age of the patients was 44.86±12.26 years. The most common symptom were chest pain and shortness of breath (28.7%) and (39.6%), respectively. Inferior wall MI was found in (33.3%) patients and left ventricle dysfunction was found in (21.6%) patients (Table. I). CK-MB and troponin T enzyme was found in raised diabetes patients, (51.9%) and (90.7%), respectively (Table. II). n=44 (12.0%) deaths were reported in 1-10 days, n=43 (11.7%) deaths were reported in 11-20 days and n=51 (13.9%) deaths were reported in 21-30 days. Gender wise stratification against the short term death was shown in Table III.

Table 1: Symptoms, LV Dysfunction and MI Distribution on the basis of ECG/Echo results

Variable	Frequency	Percentage
Symptoms		
Chest pain	105	28.7
Shortness of breath	145	39.6
Syncope	58	15.8
Sweating	24	6.6
Nausea and vomiting	34	9.3
LV Dysfunction and MI Distribution on the basis of ECG/Echo results		
Anterior wall MI	69	18.9
Inferior wall MI	122	33.3
Posterior wall MI	52	14.2
Combined wall MI	44	12.0
Left ventricle dysfunction	79	21.6

Table 2: Distribution of cardiac enzyme and diabetes with Glycated Hemoglobin

Variable	Raised N (%)	Normal N (%)
Enzyme		
CK-MB	190 (51.9)	176 (48.7)
Troponin T	332 (90.7)	34 (9.3)
Diabetes		
FBS	238 (65.0)	128 (35.0)
RBS	288 (78.7)	78 (21.3)
HbA1c	147 (40.2)	219 (59.8)

Table 3: Short term survival

Days	Male=269		Female=97	
	Survival n (%)	Death n (%)	Survival n (%)	Death n (%)
1-10	239 (88.8)	30 (11.2)	83 (85.6)	11 (14.4)
11-20	234 (87.0)	35 (13.0)	89 (91.8)	8 (8.2)
21-30	237 (88.1)	32 (11.9)	78 (80.4)	19 (19.6)

DISCUSSION

The morbidity and mortality associated with the risk of CVD can be improved by early control of DM and morbidity and mortality due to CVD increases with increase in rate of DM (18). Average age was 44.86±12.26 years. Findings are similar to a study by Koek et al in which age of males was 68.7 ±11.0 years while age of females was 73.2 + 10.3 years (19). The age of cases of diabetes with MI was 57.11±0.58 in a study by Jancaityte et al (20).

Current study revealed shortness of breath as major symptom followed by chest pain. Chest pain was major symptom in study of P. Yadav et al i.e. 94%, while percentage of breathlessness was 67% (21). PS Singh et al presented chest pain as chief symptom (90%) while 75% sweating, and 60% breathlessness next (22). According to our study the breathlessness was major symptoms (39.6%) and that of chest pain was 28.7% (23).

The reported cases with anterior wall, inferior wall, posterior wall and combined wall myocardial infarction were 18.9%, 33.3%, 14.2%, and 12%. The cases with LVD were 21.6%. PS Singh et al reported 100% cases of positive troponin T test in diabetic patients with MI (22). Abbase et al, reported 35.7% patients with increased and 64.3% with normal level of CK-MB (24). In current study 90.7% cases of elevated Troponin T and 51.9% cases with elevated CK-MB were noticed.

Cases of normal and elevated RBS were 21.3% and 78.7%, respectively while cases of normal and elevated FBS were 65% and 35%, respectively which were similar to the findings of Jaccaityte et al. According to Mani et al, the range of HbA1c levels in the patients with diabetes was in between 4.1% to 13% while mean HbA1c was 8.4 + 1.9% (25). However, in the present study the patients with elevated HbA1c levels were 40.2% and patients with normal HbA1c levels were 59.8%. In females, higher mortality rate after short stay in hospital or 28 days after myocardial infarction were reported in the studies (26, 27). It was revealed that diabetic patients had a 1.5 to 2 time's greater 28 day and 1 year mortality following an acute myocardial infarction in the hospital (26, 27). From total mortality cases (27.68%), 6.15%, 9.23%, and 12.30% mortality occurred in 1 - 10 days, 11 - 20 days, and 21 - 30 days, respectively. however, in females mortality cases were 19.6% and From the total mortality cases, 14.4%, 8.2% and 19.6% occurred in 1 - 10 days, 11 - 20 days, and 21 - 30 days, respectively. Mortality was 2.8% in old cases of age ≤60 years while 21% in the old cases of age ≥70 years and survival rate was also low. One of the major factors of increase in mortality in patients with acute MI is DM (29). Norhammar et al, demonstrated enhanced but still short and extended term mortality rates in diabetic patients after AMI (29).

CONCLUSION

In current study it was concluded that in patients with diabetes mellitus (DM), the short term mortality increase, the cases are

equal in both females and males, and further research is needed to discover techniques to improve short-term mortality.

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