DIABETES MELLITUS;
PREVALENCE OF UNDIAGNOSED DIABETES MELLITUS IN PATIENTS OF ACUTE MYOCARDIAL INFARCTION.

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Article received on:
18/04/2018
Accepted for publication:
15/10/2018
Received after proof reading:
31/01/2019

ABSTRACT… Objectives: To determine the frequency of undiagnosed diabetes mellitus (DM) in patients of acute myocardial infarction (AMI) presented in a tertiary care hospital. **Study Design:** Descriptive observational study. **Setting:** Cardiac Center at Hail Region, Saudi Arabia. **Period:** October-2016 to September-2017. **Methods:** One hundred (100) patients of acute ST-elevation myocardial infarction (STEMI and Non-STEMI) presented. Fasting blood sugar (FBS) levels more than 126 mg/dl on two consecutive samples was diagnosed as diabetes mellitus. Patients taking anti-diabetic medications were diagnosed as known cases of diabetes. All the patients records were entered in SPSS v17 for analysis. Prevalence of newly diagnosed and known diabetic patients were presented as frequency and percentage. **Results:** Mean age of acute MI patients was 51.65 ± 8.23 years. There were 82% male and only 18% female patients with male/female ratio of 4.5/1. There were 74% patients who presented with acute STEMI and remaining 26% patients presented with non-STEMI. Hypertension was present in 43% patients and smoking in 36% patients. There were 32% patients who were previously having diabetes mellitus and diabetes was diagnosed for the first time in 12% patients. Remaining 56% patients were free from diabetes. **Conclusion:** Prevalence of undiagnosed DM is very common in patients of AMI. Immediate diagnosis should be done in acute MI patients without previous history of DM.

Key words: Acute Myocardial Infarction, Diabetes Mellitus, Newly Diagnosed Diabetes Mellitus.

INTRODUCTION

Diabetes mellitus has a greater influence of everyday life and is most offently caused by improper dietary habits and sedentary life activities. At present, there are nearly about 360 million diabetic patients worldwide and this figure will reach upto 560 million by the year 2030.[1] There is also a higher prevalence of diabetes mellitus in Pakistani patients and there is an early onset of disease in our patients. The early onset in our population is probably due to rapid urbanization and sudden changes in life style of patients due to this rapid shift. Studies have also found a higher prevalence of CAD in Pakistani population.

Now it is proven that diabetes is associated with two fold increase in coronary artery disease (CAD) events in men and 3 folds in women.[2] It also worsens the prognosis in CAD patients. There is also a higher risk of Non-ST elevation myocardial infarction and ST elevation MI in diabetic patients.[3,4] The treatment of non-STEMI is same in diabetic and non-diabetics. Treatment is also same for STEMI and non-STEMI patients.[5,6] However, more aggressive management is needed in diabetics and after huge advancements in treatment modalities in management plans the prognosis is still poor in NSTEMI patients with diabetes.[7] Many of the patients admitted with acute coronary events have undiagnosed diabetes and are often diagnosed during the treatment follow-up of patients. This silent diabetes mellitus can considerably increase the risk of poor prognostics events in these patients. The aim of this present study is to determine the frequency of undiagnosed diabetes mellitus in patients of acute myocardial infarction presented

in a tertiary care hospital.

METHODS

This descriptive observational study included one hundred (100) patients of acute ST-elevation myocardial infarction (STEMI and Non-STEMI). The study was conducted in Cardiac Center at Hail Region, Saudi Arabia. Patients with previous diagnosis of MI were excluded. The study duration was 11 months from October-2016 to September-2017. Approval from ethics board of hospital was taken.

Diagnosis of diabetes mellitus was made by taking two fasting blood samples of patients in the morning at 24 hours interval. Fasting blood sugar (FBS) levels more than 126 mg/dl on two consecutive samples was diagnosed as diabetes mellitus. Patients taking anti-diabetic medications were diagnosed as known cases of diabetes.

All the patients' records were entered in SPSS v17 for analysis. Prevalence of newly diagnosed and known diabetic patients were presented as frequency and percentage.

RESULTS

Mean age of acute MI patients was 51.65+8.23 years and mean body mass index (BMI) was 26.5+4.9 Kg/m^2. There were 82% male and only 18% female patients with male/female ratio of 4.5/1. 74% patients were presented with acute STEMI and remaining 26% patients presented with non-STEMI. Hypertension was present in 43% patients and smoking in 36% patients (Table-I).

There were 32% patients who were previously having diabetes mellitus and diabetes was diagnosed for the first time in 12% patients. Remaining 56% patients were free from diabetes (Figure-1).

DISCUSSION

Prevalence of diabetes in Pakistan is not much different from the remaining part of the world. Diabetes mellitus significantly effects the other organs of the body and results in significant deterioration of all body functions.[8,9] Diabetes

now also proven to have impact on increasing the risk of acute myocardial infarction and studies have found significantly high short and long-term mortality and morbidity in DM patients as compared to non-diabetic patients.[10-12] Therefore aggressive management is done in these patients to prevent worsen outcomes. However a significantly higher number of patients with acute MI may present with silent diabetes mellitus and management of these patients in a routine way can increase the mortality in these patients. Therefore, we determined the prevalence of undiagnosed DM in patients of acute myocardial infarction.

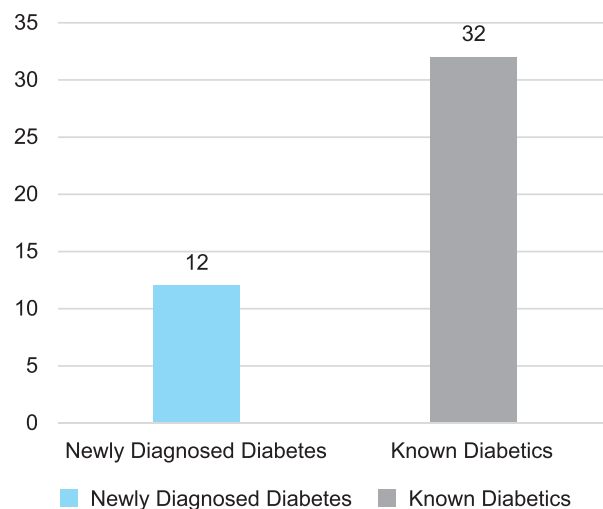| Age	51.65+8.23
BMI (kg/m^2)	26.5+4.9
Gender	
Male	82
Female	18
Type of MI	
STEMI	74
Non-STEMI	26
Co-morbidities	
Hypertension	43
Smoking	36

Table-I. Baseline study variables.

Figure-1. Prevalence of diabetes.

In our study, male to female ratio was 4.5/1. Mohammad et al.[13] reported male to female ratio of 5.6/1 in acute MI patients from Saudi Arabia. Another study from Pakistan by Babar et al.[14] reported 4.7/1 ratio of male/female in acute MI

patients.

Regarding co-morbidities, hypertension was presented in 43% patients and smoking in 19% patients. Babar et al.[14] found hypertension in 41.5% patients and smoking history in 42.5% patients of MI in Pakistani population. Alaithan et al.[15] reported hypertension in 85.3% patients and smoking history in 33.3% patients. The prevalence of hypertension in this study was higher in comparison with our study and the study of Babar et al. Ratanasumawong et al.[16] also reported huge prevalence of hypertension in 70% patients and smoking history in 25% patients of acute MI.

In our study, there were 74% patients who presented with acute STEMI and remaining 26% were having non-STEMI. Mohammad et al.[13] found 73.3% prevalence of acute STEMI and 21.6% non-STEMI and 3.1% unstable angina in study patients. We did not included patients of unstable angina in our study. AlHabib et al.[17] found 41.5% prevalence of non-STEMI in study patients in Saudi Arabia.

In our study, prevalence of new diagnosed diabetes mellitus was 12% while prevalence of known diabetics was 32%. Ashraf et al.[18] found 14.7% prevalence of newly diagnosed diabetes in Acute coronary syndrome patients. Mohammad et al.[13] found 14.3% prevalence of newly diagnosed and 48.1% prevalence of known diabetic patients. Overall prevalence of diabetes was higher in that study in ACS patients because of higher prevalence of diabetes in general population in Saudi Arabia. Karamat et al.[19] conducted a study in ACS patients without previous history of diabetes in UK and found 20% prevalence of newly diagnosed diabetes in these patients. Silent DM can have severe adverse effects on the outcomes of acute MI patients and early screening can help in early management of hyperglycemia and in aggressive management of these patients having previously undiagnosed DM.

CONCLUSION
Prevalence of undiagnosed diabetes mellitus is very common in patients of acute myocardial infarction in our population. Immediate diagnosis should be done in acute MI patients without previous history of diabetes mellitus. Early diagnosis of diabetes can help to decide management plan in these patients and may help to reduce the risk of morbidity and mortality in these undiagnosed diabetic patients.
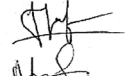**Copyright© 15 Oct, 2018.**

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Ajaz Ahmad	Conceived, Designed and wrote the manuscript.	
2	Aftab Hussain	Helped in designing the research methodology, Review the manuscript.	
3	Mirza Ahmad Raza Baig	Did statistical analysis, helped in data collection and compilation.	
4	Sadaf Akram Arain	Did data collection.	