ORIGINAL ARTICLE

FREQUENCY OF NEWLY DIAGNOSED DIABETES MELLITUS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Background: Diabetes is a major cause of heart disease. Death rate for heart disease is about 2–4 times higher among adults with diabetes then among those without diabetes. In setting of acute Myocardial infarction hyperglycemia is associated with adverse out come even after numerous "cardiac" variable linked to the outcome are adjusted. Elevated plasma glucose at admission is predictor of long term and in hospital outcome in patients with acute Myocardial infarction. After acute myocardial infarction high admission blood glucose level are common with increased risk of death in subjects with or without diabetes. The objective of study was to determine the frequency of newly diagnosis diabetes presenting with acute myocardial infarction**. Methods:** This cross sectional study was conducted in department of Cardiology, Ayub Teaching Hospital from June to November 2014. All patients admitted to coronary care unit with acute myocardial infarction and who were not known diabetics were enrolled by consecutive non probability sampling. Patients of either gender were included Hospital. Descriptive statistics were used to determine the frequency of newly diagnosed diabetics. RESULT: Out of 91 enrolled patients in our study, 60 (65.9%) were male, 31 (34.1%) were female. 27 (29.6%) patients were newly diagnosed diabetics. **CONCLUSION:** The frequency of newly diagnosed diabetics is quite high in patients with acute myocardial infarction. Hence all patients were not known diabetics and present with acute myocardial infarction should be screened for new onset of diabetes.

Keywords: Newly diagnosed diabetes, Acute Myocardial infarction, diabetes mellitus

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INTRODUCTION

Diabetes will be 7th leading cause of death in 2030. Pakistan had 5.2 million patient with diabetes in year 2013 it is projected to be 13.9 million in 2030 and it will be 6th on the list of countries with high numbers of estimated cased of diabetes.[1] Low and middle income countries will have more than 80 % of diabetes deaths.[2]

The prevalence of diabetes and impaired glucose tolerance is reported as 11.2% and 9.4% respectively in both sexes in Khyber Pakhtunkhuwa.[3]

High blood glucose level of 200 mg/dl (11.1 m mol/l) or more after acute myocardial infarction have motility rates comparable to that subject with established diabetes. Blood glucose level may serve to identify subjects at high risk of long term motility particularly among those with unknown diabetes.[4] High levels of circulatory stress hormones may be the cause of high blood glucose.[5,6] Unmasking of B-cell failure under stress may be another cause. High glucose has detrimental effect on Ischemic Myocardium.[7,8]

Hyperglycemia may represent as a marker of metabolic abnormalities in insulin resistance syndrome, which is associated with high risk of cardio vascular disease.[9–11] The blood glucose, even in normoglycaemia and overall vary of values constitutes a risk factor for coronary artery disease.[12–14] As no study has been done in Pakistan to focus on the frequency of newly diagnosed diabetic in acute myocardial infarction and because of the significance of diabetes and high blood glucose on admission we conducted the study to know the frequency of newly diagnosed diabetic in patients with AMI.

MATERIAL AND METHODS

This cross sectional study was conducted in coronary care unit, department of cardiology Ayub teaching hospital Abbottabad for a period of six months from 1st June to 30th November, 2014. All patients of both gender admitted with acute myocardial infarction were enrolled. Patients with known diabetes mellitus or impaired glucose tolerance were not enrolled. Consecutive non probability sampling technique was used to enrol the patients. Inform consent was taken, and institutional ethical committee approved the study. Acute myocardial infarction was diagnosed using criteria described in ESC/ACCF/AHA/WHF Expert Consensus Document.[15] Diabetes was diagnosed using criteria for diagnosis by the American Diabetic Association standard of medical care in diabetes 2014. Blood glucose level were done on metro lab-2300; Ravelon access clinical analyser in Ayub teaching hospital laboratory.

RESULTS

Ninety-one patients with acute myocardial infarction (AMI) and who were not known diabetics were enrolled in the study. There were 60 (65.9%) males and 31 (34.1%) were female patients. Thirty-one patients (34.1%) were known hypertensive, 17 (18.7%) were

smokers and 31 (34.1%) were neither smoker nor hypertensive, 12 (13.2%) were hypertensive and smokers. Twenty-one (29.6%) patients had newly diagnosed diabetes. Of these 27 patients 20 (74.1%) were males and 7 (25.9%) were females. Using the criteria of ESC/ACCF/AHA/WHF Expert Consensus Document, ST elevation myocardial infarction (STEMI) was diagnosed in 15 (55.6%) patients and Non ST elevation myocardial infarction (NSTEMI) was diagnosed in 12 (44.4%) patients. In patients with newly diagnosed diabetes 10 (37%) were hypertensive, 7 (25.9%) were smokers, 1 (3.7%) were smoker and hypertensive and 9 (33.3%) were neither smoker nor hypertensive. The mean age of these newly diagnosed diabetics patients were 61.30±9.934. Mean glucose level of these 27 patients was 312.074±102.505. The mean fasting blood sugar was 201.925±89.830, and mean two hours past prandial glucose was 340.15±117.939.

Table-1: Demographic data (n-27)

Variables	Range	Mean±SD
Age (in year)	35–77	61.30±9.934
Sugar at time of admission (mg/dl)	172.00–544.00	312.0741±102.50513
Fasting blood sugar (mg/dl)	108.00–437.00	201.9259±89.83058
Two hours post prandial (newly Diagnosed Patients)	149–588	340.15±117.939

Table-2: Risk factors (n=27)

Risk factors	Male n (%)	Female n (%)	Total n (%)
Hypertensive	6 (22.2)	4 (14.8)	10 (37.0)
Smokers	7 (25.9)	–	7 (25.9)
Smokers+Hypertensive	1 (3.7)	–	1 (3.7)
No Risk	6 (22.2)	3 (11.1)	9 (33.3)
Total	20 (74.1)	7 (25.9)	27 (100)

Table-3: Diagnosis (n=27)

Gender	NSTEMI	STEMI	Total
Male	9 (33.3%)	11 (40.7%)	20 (74.1%)
Female	3 (11.1%)	4 (14.8%)	7 (25.9%)
Total	12 (44.4%)	15 (55.6%)	27 (100.0%)

DISCUSSION

In patients with acute myocardial infarction (AMI) response to stress may provide important information about the metabolic status of the patients and insulin resistance state. Hyperglycaemia is found to be increasingly prevalent in patients with acute AMI.[16–18] Various Possible mechanism and relationship between admission hyperglycemia and in hospital mortality are established.[6,19–22] Decreased myocardial utilization of glucose, increased level of circulatory fatty acid due to increased lipolysis and relative insulin deficiency due to stress are few of the possible mechanism having adverse effects on myocardial function and energy metabolism. The dehydration due to hyperglycemia may lead to volume depletion output failure of the compromised ventricle and decrease stroke volume. Oxidative stress may be induced by acute hyperglycaemia.[23] Ischemia can adversely affect coagulation and fibrinolysis,[24] platelet function[25–27].

This increases the risk of congestive heart failure, re infarction or death. Hyperglycemia is an indicator and correlate with extensive cardiac damage. Dysglycaemia in a patient with AMI unmasks insulin resistance and pancreatic B-Cells dysfunction and identifies subjects with of cardiac vascular risk factors. High admission blood glucose levels is associated with short term as well as long term death after the index AMI as these patients have more extensive coronary artery disease.[28,29] In a study by Norhamman *et al* for patients with AMI admission glucose <200 mg/dl and previously non diabetic had oral glucose tolerance test,[30] 40% of these patients have impaired glucose tolerance and 25% had undiagnosed diabetes. Other study have suggested prevalence of about 4–8% of undiagnosed diabetes with AMI.[6,31,32] Cardiac biomarkers provide important information for managing patients with AMI but at present glucose level are not used as to guide therapy.

The evidence that the plasma glucose level can predict risk. The therapy aimed at achieving normoglycaemia may affect patients with AMI it should at least encourage the cardiologist to be cognizant of the glucose level.

CONCLUSION

The frequency of newly diagnosed diabetics is quite high in patients with acute myocardial infarction. Hence all patients were not known diabetics and present with acute myocardial infarction should be screened for new onset of diabetes.

RECOMMENDATION

Subject with the unknown diabetes and admission glucose levels of 200 mg/dl (11.1 mm mol/L) or higher at a base line characteristics similar to those with known diabetes suggesting that not only glucose but also other conventional risk factors should be evaluated in a subjects admitted because of AMI. Total risk assessment may disclose potently modifiable risk factors that may offer therapeutic options and these patients should be followed up after discharge.

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