Frequency of Impaired Oral Glucose Tolerance Test in Acute Myocardial Infarction patients without previous Diabetes Mellitus

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ABSTRACT

Objective: To determine the frequency of impaired glucose tolerance in patients with acute myocardial infarction without previous history of diabetes mellitus.
Study Design: Descriptive case series study.
Place & duration of study: Acute myocardial infarction patients admitted in south medical ward of Mayo Hospital Lahore from 17-09-2008 to 16-03-2009.
Subjects & methods: 170 patients of acute myocardial infarction without previous history of diabetes mellitus were included. Fasting blood glucose levels were checked first, then 75 gm of glucose was given orally. Blood glucose levels were then checked at 30 minutes, 1 hour, 2 hours, and 3 hours.
Results: The mean age of patients was 52.2±6.5 years. The mean fasting blood glucose level was 104.3±11.4mg/dl. The mean blood postprandial glucose levels at 30 minutes, 1 hour, 2 hours & 3 hours after 75gm of glucose were 145.8±15.9mg/dl, 140.1±15.3mg/dl, 136±15.8mg/dl and 130.0±16.2mg/dl respectively. There were 103 (60.6%) patients of normal blood glucose tolerance and 67 (39.4%) patients of impaired blood glucose tolerance. **Conclusions;** Glucose tolerance test is an important predictor for determination of frequency of impaired glucose tolerance & new diabetes mellitus in patients presenting with acute myocardial infarction who are not previously known diabetic.
Keywords: Impaired oral glucose tolerance test, acute myocardial infarction, and diabetes mellitus.

INTRODUCTION

Myocardial infarction stands for the development of a defined area of myocardial necrosis caused by local ischemia. Mostly acute myocardial infarction is caused by coronary artery thrombosis previously narrowed by atherosclerosis. In majority of cases, infarction occurs when atherosclerotic plaque ruptures, fissures or ulcerates[1].

Diabetes and impaired glucose tolerance (without previously history of diabetes mellitus) are associated with increased mortality in patients with acute myocardial infarction. More than half of the patients with acute myocardial infarction had undiagnosed impaired glucose tolerance or diabetes[2].

Physical activity in patients with diabetes mellitus and impaired glucose tolerance has normalizing effects on several indices of coronary heart disease including weight, blood pressure, blood lipids and cardio-respiratory fitness[3]. Undetected glucose abnormalities are common in patients with acute myocardial infarction. Newly diagnosed diabetes mellitus and impaired glucose tolerance are common in patients with acute myocardial infarction[4]. Patients with cardiovascular disease have a poorer prognosis if they are diabetic[5].

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Diabetes mellitus is a major determinant of cardiovascular risk. Random blood glucose on admission with acute myocardial infarction or acute coronary syndrome in patients without previous history of diabetes mellitus determine prognosis both short term in the hospital but also long-term. So abnormal blood glucose must be excluded in all patients with acute myocardial infarction before discharge[6].

SUBJECTS & METHODS

This study was conducted in 170 patients in the Department of Medicine, Mayo Hospital, Lahore for six months from 17-09-2008 to 16-03-2009. Patients of either sex and all ages presented with acute myocardial infarction assessed on ECG & cardiac enzymes not previously known diabetic within 24 hours of presentation and patients in NYHA class I (no limitation of physical activity, ordinary physical activity, does not cause undue fatigue, palpitation or shortness of breath) & class II (slight limitation of physical activity, comfortable at rest, but ordinary physical activity results in fatigue, palpitation and shortness of breath) were *included* while patients who were having history of diabetes mellitus & in NYHA class III & IV(unstable) and suffering from other comorbid illnesses like renal failure were *excluded.*

Acute myocardial infarction was diagnosed on basis of history of chest pain, dyspnoea, palpitation, sweating. ECG was done in every patient & criteria was at least 1mm ST segment elevation in two consecutive limb leads and/ or at least 2mm ST segment elevation in two consecutive chest leads. Cardiac enzymes like Troponin T & CK-MB were done in each & every patient and diagnosis was made on history of chest pain & elevated cardiac enzymes. All patients were subjected to oral glucose after informed consent. 75 gm of glucose was given after testing fasting blood glucose level. Then blood glucose levels were checked at 30 minutes, 1 hour, 2hour and 3 hours. All blood glucose values were transferred to SPSS version 12 and analyzed accordingly. Chi Square test was applied on results of glucose tolerance test.

RESULTS

Mean age was 52.2±6.5 years. There were 3(1.76%) patients in the age range of 31-40 years, 59(34.71%) in age range of 41-50 years and 108(63.53%) in the age range of 51-60 years. The mean fasting blood glucose was 104.3±11.4 mg/dl. There were 103(60.6%) patients of fasting blood glucose range of up to 110mg/dl and 67(36.4%) were in range of 111-126mg/dl. The mean blood postprandial glucose tolerance test after 75gm of oral glucose at 30 minutes, 1 hour, 2 hours, and 3 hours were 145.8±15.9 mg/dl,140.1±15.3 mg/dl,136±15.8 mg/dl and 130±16.2 mg/dl respectively. There were 103(60.6%) patients of normal glucose tolerance and 67(39.4%) patients of impaired glucose tolerance out of total of 170 patients.

DISCUSSION

Milvidaite et al [7] evaluated that on glucose tolerance test, there were 57.9% patients diagnosed as normal glucose tolerance and 10.1% as diabetic. Wallander et al[8] conducted a similar study and found that on glucose tolerance test, 34%,31% and 34% patients were diagnosed as normal glucose tolerance, impaired glucose tolerance and diabetics respectively. Patients with impaired glucose tolerance & diabetes mellitus have a significantly shorter survival after myocardial infarction than those with a normal glucose tolerance. Newly diagnosed diabetes mellitus and impaired glucose tolerance were common among patients with acute myocardial infarction. Abnormal glucose tolerance in patients with acute myocardial infarction is a major risk factor for future cardiovascular events and may critically distinguish high risk individuals.

CONCLUSION

Postprandial glucose tolerance test is an important predictor for determination of frequency of impaired glucose tolerance test in patients presenting with acute myocardial infarction who are not previously known diabetic.

REFERENCES

1. Antaman EM, Braunwald E. ST-segment elevation myocardial infarction. In: Kasper DL, Fauci A. Harrison's principles of internal medicine. 16th ed. McGraw Hill, 2005:1448-59.
2. Andersen GO, Eritsland J, Aasheim A, Neuburger J, Knudsen EC, Mangschau A. Impaired glucose tolerance in patients with acute myocardial infarction. Tiddskar Nor Laegeforen 2006; 126:2264-7.
3. Batly GD, Shipley MJ, Marmot M, Smith GD. Physical activity and cause specific mortality in men with type 2 diabetes mellitus/impaired glucose tolerance: evidence from the white hall study. Diabet Med 2002; 19:580-8.
4. Tamita K, Katayama M, Takagi T, Akasaka T, Yamamuro A, Kaji S, et al. Impace of newly diagnosed abnormal glucose tolerance on long-term prognosis in patients with acute myocardial infarction. Circ J 2007; 71: 834-41.
5. Espinola-Klein C, Rupprecht HJ, Blankenberg S, Blankenberg S, Bickel C, Fossmeyer U, Kopp H, et al. Influence of impaired fasting glucose on the incidence and prognosis of atherosclerosis in various vascular regions. Z Kardiol 2004;93:IV 48-55.
6. Standl E. GAMI: glucose abnormalities in patients with myocardial infarction prevalence and prognostic implications. Br Med J 2003;26:89-99.
7. Milvidaite I, Slapikas R, Statkeviciene A, Babarskiene MR, Luksiene D, Slapikiene B. Admission hypoglycemia and abnormal glucose tolerance at discharge in patients with acute myocardial infarction and no previous history of diabetes mellitus. Medicina (Kaunas) 2007; 43: 935-41.
8. Wallander M, Malmberg K, Norhammar A, Ryden L. Tenerz A. Oral glucose tolerance test: a reliable tool for early detection of glucose abnormalities in patients with acute myocardial infarction in clinical practice: a report on repeated oral glucose tolerance tests from the GAMI study. Diabetes Care 2008; 31:36-8.