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Original Article

Effect of Random Blood Sugar (RBS) on In-Hospital Outcome of Acute Myocardial Infarction in Diabetes Mellitus

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Abstract

Introduction: *Hyperglycaemia is one of the causes of coronary artery disease in Diabetic patient. Control of glucose level reduces the mortality and morbidity in coronary artery patient with diabetes.*

Methods: *This prospective observational study was carried on a total of 82 adult diabetic patients with acute myocardial infarction, in the Department of Medicine, Dhaka Medical College, Dhaka, over a period of six months.*

Results: *The mean age was 58.39 years with standard deviation of mean of ±15.58 years and their age ranged from 30 to 74 years. In this present study 62.19% were male and rest 37.81% were female. It was observed that most (78.04%) had random blood sugar (RBS) level between 16-20 mg/dl during the time of admission. Mean RBS among the survivors and non- survivors ware 14.85 mg/dl and 20.74 mg/dl respectively, and the difference was statistically significant. Overall mortality of diabetic patients in acute myocardial infarction was 5 in 82# (6.09%) in the present study.*

Conclusion: *Diabetes mellitus has relation with development of nephropathy with the course of duration of disease. So, physician should pay attention to the diabetes mellitus patients for long time during treatment.*

Key words: *Acute Myocardial infarction, Random blood sugar, Diabetes Mellitus.*

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Introduction

Acute Myocardial Infarction (AMI) can be considered as a potential epidemic for mankind.The hospital mortality rate of acute Myocardial Infarction in Bangladesh is 2.54 %.[1]

AMI is one of the most common diagnoses in hospitalized patients in industrialized countries. In the United States, approximately 650000 experience a new AMI and 450000 experiences a recurrent AMI each year.

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The early (30 days) mortality rate from AMI is 30%, with more than half of these deaths occurring before the affected individual reaches the hospital. Although the mortality rate after admission for AMI has declined by 30% over the past two decades.[2] Myocardial infarction (MI) is a common presentation of ischemic heart disease (coronary artery disease). The World Health Organization estimated in 2004, that 12.2% of worldwide deaths were from ischaemic heart disease; with it being the leading cause of death in high or middle income countries and second only to lower respiratory infections in lower income countries.[3] Worldwide more than 3 million people have ST segment elevation myocardial infarction (STEMIs) and 4 million have Non ST-segment elevation myocardial infarction (NSTEMIs) per year.[4,5] Rates of death from ischemic heart disease have declined in most high income countries, although cardiovascular disease still accounted for 1 in 3 of all deaths in the USA in 2008.[6] In contrast, ischaemic heart disease is becoming a more common cause of death in the developing world. For example in India, ischaemic heart disease had become the leading cause of death by 2004 accounting for 1.46 million deaths (14% of total deaths) and deaths due to ischaemic heart disease were expected to double during 1985–2015.[5] Globally it is predicted that disability adjusted life years (DALYs) loss due to ischaemic heart disease will account for 5.5% of total DALYs in 2030, making it the second most important cause of disability as well as the leading cause of death by this date.[7]

Patients with DM are at increased risk of developing cardiovascular diseases and have greater morbidity and mortality.[5] It has been shown that diabetic patients without previous MI and cardiovascular disease have as high a risk of MI as nondiabetic patients with previous MI and cardiovascular disease.[6, 7, 9] It has also been documented that in-hospital and long term morbidity and mortality are increased in patients with diabetes.[7-12]

Several studies regarding diabetes mellitus with AMI had been conducted in our country but a very few studies had conducted regarding effect of random blood sugar in Bangladesh.

Materials and methods

This observational study was carried out to evaluate 82 subjects aged 30-74 years suffering from AMI in the Department of Medicine, Dhaka Medical College, Dhaka with the general objective to evaluate the in-

hospital outcome of acute myocardial infarction among the patients with diabetic mellitus. The study subjects were enrolled in this study after fulfillment of the inclusion criteria and MI was diagnosed on basis of ECG findings. The objective of the study was discussed in details with the patients or their attendants before their decision to enroll themselves into the study. ECG report was collected from previous ECG investigation or during bedside ECG. Demographic information was prospectively recorded and substantiated by means of inspection of medical record. Information included was the subject's age, gender, medical history, including history of diabetes. Comparison between RBS in outcome of AMI was done by independent t-test.

Results

A total of 82 cases were included in the study. The mean age was 58.39 years with standard deviation of mean (SD) ±15.58 years and their age ranged from 30 to 74 years. Majority [40 (38.09%)] of the respondents was found in the age group of 51-60. About 34.28% subjects were found in 41-50 years age group. Fourteen (13.33%) subjects had age below 40 years. Fifteen (14.30%) subjects belonged to 61 years and above age groups. Out of total 82 subjects, 51 (62.19)% were male and 31 (37.81)% were female (Figure 2).

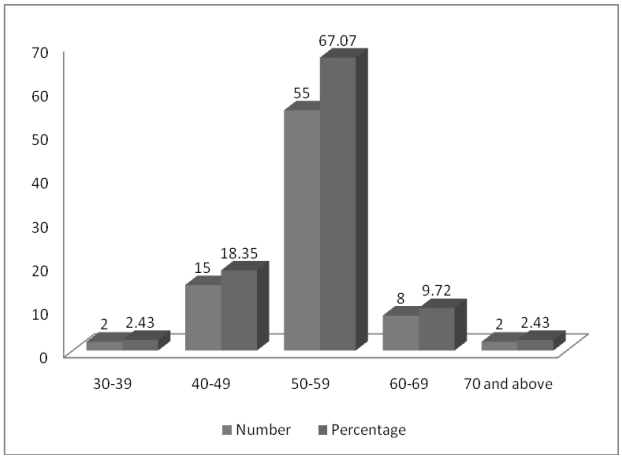

Figure 1: Bar diagram showing age distribution of the study subjects.

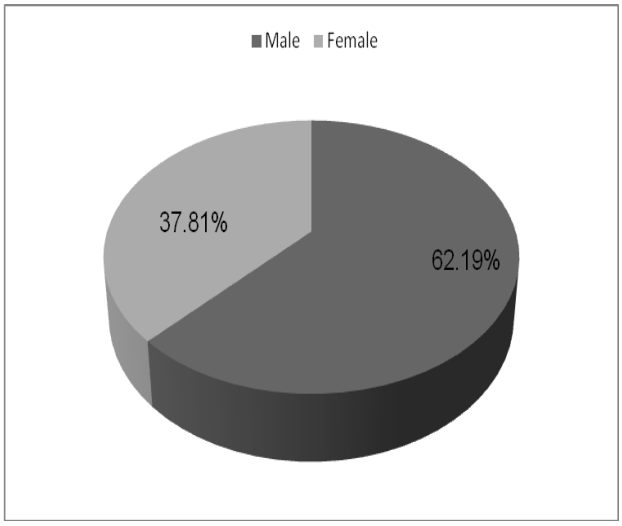

Figure 2: Pie chart showing gender distribution of the study subjects.

The mean duration of diabetes, was 6.73 (±3.22) years (Table I). The respondents suffered from diabetes for 3 to 10 years.

Majority (54.87%) of the subjects had diabetes for more than 5 years.

Table I: Duration of diabetes mellitus in the study subjects

Duration of Diabetes (years)	N	%
≤5	37	45.13
>5	45	54.87
Mean±SD	06.73±03.22	
Range (Minimum-maximum)	03-10	

It was revealed that most 64 (78.04%) had random blood sugar (RBS) level between 16-20 mg/dl during the time of admission. 12 (14.63%) subjects had random blood sugar (RBS) level between 10-15 mg/dl. Only 6 (7.33)% had a level of blood sugar at 21 mg/dl and above. In general mean RBS among the study subjects was 14.27±08.92 mg/dl. Mean RBS among the survivors and non- survivors ware 14.85 mg/dl and 20.74 mg/dl respectively and there was statistically significant difference between mean RBS between the survivors and non- survivors (Table II).

Table II: Glycaemic (RBS) status of the study subjects during admission (n=82)

RBS (mg/dl)	N	%
10-15	12	14.63
16-20	64	78.04
21 and above	06	07.33
Mean ± SD (mg/dl)	14.27±08.92	
Mean ± SD (mg/dl) in survivors	14.85±5.58	t/P value
Mean ± SD (mg/dl) in non-survivors	20.74±03.65	2.54/0.025

Note: S= significant, P value reached from t – test and value was considered significant when P<0.05

Discussion

Among the 82 cases of acute myocardial infarction with diabetes mellitus under study the mean age was 58.39 years and their age ranged from 30 to 74 years. Majority of the respondent was found in the age group of 51-60. This present study findings are very much comparable with the described epidemiology [8, 15] of diabetic acute MI patients.

The mean RBS among the study subjects was 14.27±08.92 mg/dl. Mean RBS among the survivors and non- survivors were 14.85 mg/dl and 20.74 mg/dl respectively and there was statistically significant difference between mean RBS between the survivors and non-survivors. So, it could be assumed that higher blood glucose level might have effect on mortality among the diabetic subjects with acute MI. In a recent study, Krishna et al. (2012) [13] found that 40% mortality occurred in those having plasma sugar levels (PSL) >126mg% at the time of admission. Although mortality rate in the present study was lower (6.09%) than the study conducted by Krishna et al.[13] it was clear from these both studies that hyperglycemia was one of the contributing factors for mortality in diabetic MI subjects.

Conclusion

From the study findings it could be concluded that diabetic subjects with AMI had poor Glycaemic control and this uncontrolled blood sugar level had significant effect on mortality rate. So physicians should pay extra attention in case of diabetic patients with acute MI to reduce mortality and other complications efficiently.

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