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Research Article

Prevalence of Diabetes Mellitus in Myocardial Infarction Patients -An Observational Study

Nikita Chauhan[1], Paras Chauhan[2]
[1]District Program Officer, Kullu
[2]Junior Resident, Department of Community Medicine, Dr RPGMC

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Address for Correspondence: Nikita Chauhan

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Abstract:

Background: According to studies, having diabetes is a risk factor in and of itself for developing cardiovascular disease. The World Health Organization (WHO) reports that the worldwide burden of death and morbidity attributable to cardiovascular disease is increasing.

Material & Methods: The present observational research was conducted at our tertiary care institution and lasted six months, from June to November 2022. We recruited 100 AMI patients upon receipt of written informed permission.

Results: 60% of research participants had normal blood sugar levels, 25% previously knew they had diabetes mellitus, 11% had the diagnosis identified while they were hospitalized, and 4% experienced stress-related blood sugar elevations.

Conclusion: In addition to being a predictor of prognosis and recurrences, elevated blood sugar was connected to acute cardiovascular problems, especially in those with acute myocardial infarction.

Keywords: Risk factors, prevalence of diabetes mellitus, and acute myocardial infarction.

Introduction

Acute myocardial infarction (AMI) is one of the leading causes of death and morbidity globally. According to the World Health Organization (WHO), cardiovascular disease is a non-communicable illness that is now on the increase. Ischemic heart disease (IHD) prevalence in the adult population of India was estimated to be 97 per 1000 in urban areas and 27 per 1000 in rural areas based on clinical and ECG criteria (1). Non-communicable disease diabetes is very prevalent globally and seems as an epidemic on a global scale. According to studies, having diabetes is a risk factor in and of itself for developing cardiovascular disease. Data from the World Health Organization (WHO) show that cardiovascular disease-related mortality and morbidity have increased globally (2).

The prevalence of cardiovascular diseases among persons with diabetes was found to be three times greater in women than in non-diabetics and two times higher in males than in non-diabetics, according to the well-known cohort study Framingham research. According to epidemiological traits, early impairment, and the proportion of morbidity and death, ischemic heart disease produces a number of significant health-related as well as social challenges across all affected age groups (3). Diabetes and cardiovascular disease have been associated over the last seven to eight decades.

According to research, diabetics had a 2-4 times greater risk than non-diabetics of acquiring coronary diseases, and the same was true for acute myocardial infarctions. The frequency of acute myocardial infractions did, however, show a proven drop as a result of early diagnosis and treatment (4). According to research, 20% of AMI patients in hospitals who had never had diabetes before had their blood sugar levels rise while they were there. As a consequence, individuals with AMI who were hospitalized had greater death rates (5). According to studies, medical disorders that generate stress are the root of this relationship. It's also possible that an undiscovered diabetes underlying problem is to blame. The present study was conducted to learn more about the prevalence of diabetes mellitus in individuals with acute myocardial infarctions.

Materials & Methods

The present observational research was conducted at our tertiary care institution and lasted six months, from June to November 2018. A sample size of 100 with a 95% confidence interval and a 10% permissible margin of error was estimated using Epi Info software version 7.2. The institutional ethics committee gave its permission before the project got started. Each research participant signed a written informed consent form. Each patient had a full medical history taken, which included data on their blood pressure, smoking and drinking habits, as well as previous clinical and medical experiences. The research excluded individuals with epilepsy, subarachnoid hemorrhage, subdural hematomas, or any other neurological condition or disability that would affect the patients' HbA1c readings. The patients' blood was collected to check their HbA1c and random blood glucose levels. Additionally, estimations of the second and fifth days' fasting blood glucose levels were produced. The data analysis was done using SPSS v22. The 5% alpha level of significance, which indicates the existence of a significant connection if the p-value is less than 0.05, was used for all analyses.

Results

The present research included 100 individuals with acute myocardial infarction in total. In contrast to the 64% male patients, only 36% of the patients were female. The patients ranged in age from 66.2 to 7.4 years on average. Patients with a BMI under 25 made up the remainder patients, whereas 35% of patients had a BMI above 25.34% of patients smoked, and 28% of patients were habitual drinkers. Sixty percent of research participants had normal blood sugar levels, twenty-five percent had diabetes mellitus that they were previously aware of, eleven percent had their diabetes found for the first time when they were hospitalized, and four percent experienced stress-related blood sugar elevations. (Table 1)

Table 1: Distribution of study participants according to demographic details.

Parameters		No. of patients (%)
Gender	Male	64
	Female	36
BMI	<25	65
	≥25	35
Smoking Habit	Smokers	34
	Non-Smokers	66
Alcohol Habit	Alcoholic	28
	Non-Alcoholic	72
Glycemic Status	Euglycemic	60
	New Diabetics	11
	Known Diabetics	25
	Stress hyperglycemia	4

High cholesterol and triglyceride levels were seen in the majority of the participants in the current research who were hospitalized for an AMI and diabetes mellitus. The TGL levels were found to be 199.78.6 mg/dl, while the total cholesterol was 221.410.2 mg/dl. The present study's findings indicate that diabetic individuals who have previously had an AMI attack are much more likely to have another one in the future. (Table 2)

Table 2: Distribution of study participants according to biochemical parameters.

Parameters	Patients with diabetes	Patients without diabetes
Hb (g%)	13.4±1.2	12.2±0.6
Fasting plasma glucose(mg/dL)	130.1±8.4	95.8±3.5
Glycated hemoglobin	8.7±0.9	5.3±0.4
Total cholesterol (mg/dL)	221.4±10.2	154.9±8.7

Discussion

The present research included 100 individuals with acute myocardial infarction in total. In contrast to the 64% male patients, only 36% of the patients were female. The patients ranged in age from 66.2 to 7.4 years on average. Patients with a BMI under 25 made up the remainder patients, whereas 35% of patients had a BMI above 25.34% of patients smoked, and 28% of patients were habitual drinkers. Sixty percent of research participants had normal blood sugar levels, twenty-five percent had diabetes mellitus that they were previously aware of, eleven percent had their diabetes found for the first time when they were hospitalized, and four percent experienced stress-related blood sugar elevations. Patients with acute myocardial infarction who were diabetes were more likely to have complications than those with normal blood glucose levels. The most frequent consequences were myocardial rupture, recurrent infarction, atrioventricular and intraventricular conduction abnormalities, cardiogenic shock, and prolonged congestive heart failure (6).

Participants in the present research with acute myocardial infarction had a 40% overall prevalence of diabetes. 25% of patients with acute myocardial infarction had diabetes mellitus, according a research by Tenerz et al. In this research, 305 people took part. Since high random blood glucose levels upon admission were not a reliable predictor of diabetes, follow-up was necessary. A non-significant predictor for the diagnosis of diabetes was found to be HbAlc (7). According to a research by Kosiborod M. et al., higher blood glucose levels are prevalent in older patients with acute myocardial infarction and have been linked to a significant mortality risk, particularly in those patients who had previously been unaware of their diabetes status (8).

High cholesterol and triglyceride levels were seen in the majority of the participants in the current research who were hospitalized for an AMI and diabetes mellitus. The TGL levels were found to be 199.78.6 mg/dl, while the total cholesterol was 221.410.2 mg/dl. The present study's findings indicate that diabetic individuals who have previously had an AMI attack are much more likely to have another one in the future.

Cardiovascular diseases are the leading cause of mortality in wealthy countries like the USA, particularly if they involve concomitant illnesses like diabetes, according to a research by Thom T. et al. on patients with acute myocardial infarction. Patients' life expectancies therefore reduced (9). In patients with acute myocardial infarction, Capes S. et al. found that stress-induced hyperglycemia is associated with a high risk of in-hospital mortality in both patients with and without diabetes, as well as an elevated risk of cardiovascular morbidity and cardiogenic shock (10).

Another research by Bartnik M et al. indicated that some patients with acute myocardial

infarction had normal glucose metabolism, which led to higher blood glucose levels in such patients. An oral glucose tolerance test was used to determine blood glucose levels after two hours of glucose consumption, and the results amply demonstrated the glucometabolic state. This assessment of the glucometabolic state levels in patients with acute myocardial infarction had an impact on the treatment of the condition and the prognosis (11).

Conclusion

The present research found that increased blood sugar levels were associated with acute cardiovascular diseases, especially in those who had just had an acute myocardial infarction, and also acted as a predictor of prognosis and recurrence. Patients with a history of acute myocardial infarction will benefit from better outcomes and a greater quality of life if their blood sugar levels are effectively managed.

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