



CARDIAC PROFILE IN DIABETIC PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

Cardiology

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KEYWORDS

INTRODUCTION

Diabetes mellitus is the second most common disease in the world, after cardiovascular disease. [1]. Cardiac disease is by far the most common cause of death among diabetics [2]. Coronary artery disease is the most common symptom of cardiac involvement in diabetics. Less common entities are Diabetic cardiomyopathy and cardiac autonomic neuropathy. Coronary artery disease is responsible for 40% of diabetic deaths in their fourth decade, and it accounts for 50- 70% of deaths among diabetics over the age of 65 years [2]. Patients with diabetes are more likely to develop a diffuse and fast-progressing form of atherosclerosis, which increases the need for revascularization [3]. Diabetic patients had a much higher rate of multivessel disease, left main coronary artery involvement, and intracoronary thrombus than non-diabetic patients [4]. Potent antiplatelet therapy, heparin or Low Molecular Weight Heparin (LMWH) early invasive evaluation, and, if suitable, stent-based Percutaneous Coronary Intervention (PCI) are the mainstays of treatment [5]. Coronary Artery Bypass Graft (CABG) may be a viable option in patients with complicated coronary architecture. [6]. The present study aimed to assess the correlation of severity, and duration of diabetes with angiography profile and LV dysfunction.

MATERIALS AND METHODS

Prospective observational study conducted in tertiary care hospital after getting approval from hospital IEC committee. The patients were enrolled in the study after obtaining written consent from them or their attendants.

Sample Size Estimation:

$n = (z)^2 pq / d^2$ n = sample size, $CI = 95\%$, $d = 0.2$, $z = 1.96$, $p = 0.125$, $q(100 - p) = 0.875$ $n = (1.96)^2 \times 0.125 \times 0.875 / (0.2)^2 \times 10 = 150$.

Inclusion Criteria: known Diabetic patients with age 18 years and above with acute Myocardial infarction who had ST-segment elevation and T wave changes with reciprocal changes, as well as new pathological Q waves on their Electrocardiogram (ECG).

Exclusion Criteria: Patients with acute ST-segment elevation myocardial infarction (STEMI) who were non-diabetic or newly detected diabetes. Detailed history, clinical examination, and investigations like Electrocardiogram, 2D echocardiography, and glycated hemoglobin (HbA1C) with coronary angiography were carried out.

Statistical Analysis

The data was analyzed using the International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) statistics software version 23.0. Descriptive statistics for all qualitative variables were represented using frequency and percentage. Association between the groups was assessed using the chi-square test in Python. For all the comparisons, the p-value of less than 0.05 was considered statistically significant.

RESULTS –

We assessed 150 diabetic patients, with a mean age of 57.45 ± 9.44 years. Among these patients, 103 were males and 47 were females. The majority of the subjects (34.78%) were in the age group of 51 to 65 years. Coronary angiography findings revealed that 75 patients had

single vessel disease (SVD), 44 had double vessel disease (DVD), and 31 had triple vessel disease (TVD). In the SVD category, 21 patients (28%) had a duration of diabetes mellitus (DM) of less than 5 years, compared to 14 patients (31.81%) in the DVD category, and 8 patients (25.80%) in the TVD category. Additionally, 42 patients (56%) with SVD, 18 patients (40.90%) with DVD, and 6 patients (19.35%) with TVD had HbA1c values of less than 8.5.

For patients with a duration of diabetes of more than 5 years, 54 patients (72%) had SVD, 30 patients (68.18%) had DVD, and 23 patients (74.19%) had TVD. In the category of HbA1c values of 8.5 and above, 33 patients (44%) had SVD, 26 patients (59.09%) had DVD, and 25 patients (80.64%) had TVD. A total of 98 patients had left ventricular failure, of which 38 patients (38.77%) had a diabetes duration of less than 5 years, and 60 patients (61.22%) had a diabetes duration of more than 5 years. Among the patients with left ventricular failure, 42 patients (42.85%) had HbA1c values of less than 8.5, while 56 patients (57.14%) had HbA1c values of 8.5 and above. It was observed that a longer duration of diabetes mellitus and higher HbA1c levels were associated with more coronary vessel or multivessel involvement and a higher incidence of left ventricular failure (statistically significant, p-value <0.05).

Variables	Coronary Angiography				left-ventricular failure
	SVD n=75	DVD n=44	TVD n=31	Total n=150	Total n=98
Duration of diabetes					
• <5 YEARS	21 (28.00 %)	14(31.81 %)	8 (25.80 %)	43 (28.66%)	38 (38.77%)
• >5 YEARS	54 (72.00 %)	30 (68.18%)	23(74.19 %)	107 (71.33%)	60 (61.22%)
HbA1C values					
• <8.5 %	42 (56.00 %)	18 (40.90%)	6(25.80 %)	68 (45.33%)	42 (42.85 %)
• 8.5 % and above	33(44.00 %)	26 (59.09%)	25 (74.19 %)	82 (54.66%)	56 (57.14%)

Chi-square test was performed and p value less than 0.05 was considered statistically significant

DISCUSSION-

A total of 150 participants were enrolled in the study. We assessed coronary artery involvement and left ventricular dysfunction, correlating them with the duration of diabetes mellitus and HbA1C levels. It was observed that patients with a duration of diabetes mellitus of more than 5 years had a higher number of multivessel involvements. This finding was consistent with Srinivasan MP et al. [7]. Diabetic patients with poor glycemic control (HbA1c > 8.5%) made up 54.6% of the participants in this study. This shows that inadequate glucose management causes multiple coronary artery involvement and stenosis severity, consistent with Malthesh MK et al. [1]. It was also found that a longer duration of diabetes was significantly associated

with LV systolic dysfunction, consistent with the study by Mishra et al. [8]. Additionally, a higher level of HbA1C was associated with LV dysfunction, consistent with the study by Iribarren C et al. [9].

CONCLUSION-

In conclusion, our study highlights a significant association between the duration of diabetes mellitus, HbA1c levels, and cardiac complications in diabetic patients experiencing acute myocardial infarction (MI). We observed that a longer duration of diabetes and elevated HbA1c levels are strongly correlated with increased coronary artery involvement, including multivessel disease, and a higher incidence of left ventricular failure. These findings underscore the critical need for stringent glycemic control and early cardiovascular risk assessment in diabetic patients to mitigate the adverse cardiac outcomes associated with acute MI. Future research should focus on targeted interventions and management strategies to improve cardiovascular prognosis in this high-risk population.

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Conflict Of Interest- not declared

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