Original Article

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Angiographic Severity of CAD in Diabetic Versus Non-Diabetic Patients Presenting with STEMI

Muhammad Niaz Khan[1], Samiullah Khan[2], Shahab Saidullah[3], Sadullah Shah[4], Muhammad Nadeem Khan[5], Nasir Ali[6], Sunehra Iqbal[7]

[1]Fellow Interventional Cardiology, Hayatabad Medical Complex, Peshawar
[2]Associate Professor Cardiology, Bannu Medical College/DHQ-TH Bannu,
[3]Assistant Professor Pakistan institute of medical sciences, Islamabad,
[4]Associate Professor Cardiology Bannu Medical College/KGN-TH Bannu, ,
[5]Assistant Professor cardiology, Bannu Medical College , Bannu, [6]Fellow Interventional Cardiology, Hayatabad Medical Complex, Peshawar, [7]Medical Officer. DHO, Bannu

Author`s Contribution

[1,2,3]Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work, Final approval of the version to be published, [4,5]Drafting the work or revising it critically for important intellectual content; [6-8]Literature review, Analysis

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Address of Correspondent
Dr. Samiullah khan
Associate Professor Cardiology,
Bannu Medical College/DHQ-TH Bannu
drsamee@yahoo.com

ABSTRACT

Objective: To determine the angiographic severity of CAD in diabetic versus non-diabetic patients undergoing primary PCI for STEMI.

Methodology: This cross-sectional observational study was carried out in the Cardiology unit of Hayatabad Medical Complex Peshawar from January, 2021 to August 2021. All patients undergoing primary PCI for STEMI at cardiology unit of HMC were included in the study after a thorough history, examination and informed consent. Patients were divided into two categories on the basis of diabetes status. Furthermore, patients were also classified on the basis of number of vessels with significant coronary stenosis. Continuous variables were described as means and standard deviations whereas categorical variables were described as frequencies and percentages. Chi-square test was applied to determine the significance of categorical variables.

Results: A total of 68 patients with a mean age of 52±4.5 years were included in the study. Of these, 49 were males and 27 patients had diabetes. In the diabetes group, 20 patients had a history of anterior wall MI whereas 19 patients had history of anterior wall MI in the non-diabetes group. Similarly, 15 patients in the diabetes group and 11 patients in the non-diabetes group had inferior wall MI (p: 0.095). Furthermore, the number of patients who had TVCAD, DVCAD and SVCAD in the diabetic group was 15, 5 and 7 compared to 7, 15 and 19 in the non-diabetic group respectively (X2=11.039, p:<0.01). Two patients in the diabetes group had stent thrombosis whereas only 1 patient had stent thrombosis in the non-diabetes group. One patient died in the cath lab in the diabetic group whereas there was no mortality in the non-diabetic group.

Conclusion: Diabetic patients presenting with STEMI is having more severe and extensive CAD during primary PCI as compared to non diabetic patients.

Keywords: Acute Myocardial Infarction, Coronary Artery Disease, diabetes

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Introduction

Diabetes is the leading cause of cardiovascular morbidity and mortality worldwide.[1] The reported prevalence of CAD in diabetic patients ranges from 9.5% to 55%.[2] The majority of type 2 diabetes patients die from cardiovascular causes, and type 2 diabetes is a significant independent risk factor for the development of CAD.[3] Globally, about a third of all coronary artery disease related deaths are attributed to diabetes.[4] Studies have shown that poor glycemic control is associated with worse outcomes in patients presenting with acute coronary syndromes.[5] The severity of coronary artery disease is positively correlated with the duration of diabetes

and the level of glycemic control in diabetic populations.[6] The prevalence of coronary artery disease is increased exponentially in diabetic patients (55%) compared with the general population (2-4%).[7] Men with diabetes have an overall twice the mortality from heart disease whereas in diabetic women, the situation is even worse.

The objective of this study was to evaluate and compare the severity of coronary artery disease in diabetic versus non-diabetic patients by coronary angiography.

Methodology

This was a cross-sectional descriptive study conducted in Cardiology unit of Hayatabad Medical Complex Peshawar from January, 2021 to August 2021. All patients undergoing primary PCI for STEMI at cardiology unit of HMC were included in the study after a thorough history, examination and informed consent. Patients with a previous history of congenital heart abnormalities and post CABG status were excluded from the study. Patients were divided into two categories on the basis of diabetes status.

Furthermore, patients were also classified on the basis of number of vessels with significant coronary stenosis. Significant coronary stenosis was defined as an angiographic stenosis of 70% or more in a major epicardial coronary artery. Continuous variables were described as means and standard deviations whereas categorical variables were described as frequencies and percentages. Chi-square test was applied to determine the significance of categorical variables. All data was recorded on a predesigned proforma. SPSS version 2.0 was used for statistical analysis and data was presented in frequencies and percentage. Chi Square test was used for any significance statistical differences among categorical variables.

Results

A total of 68 patients with a mean age of 52±4.5 years were included in the study. Of these, 49 were males and 27 patients had diabetes. All baseline characteristics are given in Table I. In the diabetes group, 20 patients had a history of anterior wall MI whereas 19 patients had history of anterior wall MI inthe non–diabetes group. Similarly, 15 patients in the diabetes group and 11 patients in the non–diabetes group had inferior wall MI (p: 0.095) as shown in Table II. Furthermore, the number of patients who had TVCAD, DVCAD and SVCAD in the diabetic group was 15, 5 and 7 compared to 7, 15 and 19 in the non- diabetic group respectively (X^2=11.039, p:<0.01). Two patients in the diabetes group had stent thrombosis whereas only 1 patient had stent thrombosis in the non-diabetes group. One patient died in the cath lab in the diabetic group whereas there was no mortality in the non-diabetic group. The vesselsinvolved in each group are given in Table III.

Table I: Baseline Characteristics

	Diabetics (n: 27)	Non-Diabetics (n: 41)
Males	18 (66.66%)	31 (75.60%)
Females	9 (33.33%)	10 (24.39%)
Hypertension	18 (66.66%)	16 (39.02%)
Smoking	8 (29.62%)	7 (17.07%)
Family History	7 (25.92%)	2 (4.87%)
Dyslipidemia	10 (37.03%)	3 (7.31%)
Previous IHD/MI	6 (22.22%)	5 (12.19%)
Previous PCI	3 (11.11%)	2 (4.87%)
Previous CABG	0 (0%)	0 (0%)

Table II: Angiographic Findings

	Diabetics	Non-Diabetics	Chi Square Value (p Value)
AWMI	20 (74.07%)	19 (46.34%)	X^2=4.7039 (p: 0.095)
IWMI	5 (18.5%)	11 (26.82%)	
PWMI	2 (7.40%)	9 (21.95%)	
SVCAD	7 (25.92%)	19 (46.34%)	X^2=11.039 (p: <0.01)
DVCAD	5 (18.51%)	15 (36.58%)	
TVCAD	15 (55.55%)	7 (17.07%)	
LMS Disease	1 (3.70%)	2 (4.87%)	
Stent Thrombosis	2 (7.40%)	1 (2.43%)	
Expired in Cath Lab	1 (3.70%)	0 (0%)	

Table III: Culprit Vessel

	Diabetics	Non-Diabetics	Chi-Square Value (p Value)
LAD	24	35	X^2=0.1309 (p: 0.936)
LCX	16	20	
RCA	18	25	

Discussion

Coronary artery disease puts a very significant burden on healthcare throughout the globe. Although the major risk factors for CAD are similar the world over, there are slight differences in the distribution of these risk factors among various races.[8] Diabetes continues to be a daunting healthcare issue globally and in Pakistan specifically.[9, 10] The association of diabetes is well documented with CAD but the pattern of CAD is very different in diabetic population compared to non-diabetic population. Furthermore, South Asians[11] are more likely to die of

CAD at a younger age compared to people of western ethnicity.[12] Due to the lack of early detection, diagnosis and eventual treatment of diabetes in our population, the pattern of CAD seen is relatively advanced and diffuse compared to non-diabetics.[13] Moreover, the number of diabetic patients seeking medical attention for cardiac related issues is also comparatively low due to the atypical presentation of CAD in many of these patients leaving a significant number of these diabetic CAD patients undetected until they have an acute coronary syndrome which is usually the first instance of CAD diagnosis in these patients.[14] Another important factor that contributes to aggressive atherosclerosis in diabetic populations is the suboptimal prophylaxis in diabetic patients with a statin.[15] Hence, the advanced and diffuse nature of CAD at presentation in diabetic patients in our population is multifactorial and screening for CAD should be dealt with a low threshold in diabetics.

In our study, diabetic patients who were undergoing primary PCI were found to have more extensive coronary artery disease compared to non-diabetic patients undergoing primary PCI. We had 15 (55.55%) patients in the diabetic group who had TVCAD compared to only 7 (17.07%) patients who had TVCAD in the non-diabetes group. Similarly, only 7 (25.92%) patients in the diabetes group had SVCAD compared to 19 (46.34%) patients who had SVCAD in the non-diabetes group. Diabetic patients were more likely to have significant stenosis in non-culprit vessels compared to patients with no diabetes (X^2=11.039, p:<0.01). Parvin et al found in a similar study that diabetic patients had more severe CAD compared to non-diabetics (Gensini Score: 50.9±29.9 versus 32.6±21.9, p 0.001).[16] Although there were more diabetic patients with TVCAD in their study (50% versus 31%) but statistically it was insignificant with a p value of 0.094. On the other hand, in our study, we found a statistically significant difference in the two groups with 55.55% of our diabetic patients having TVCAD compared to only 17.07% having TVCAD in the non-diabetic patients.

The major limitations of our study were that it was a single center study cross-sectional study and that we did not use a scoring system like the Gensini scoring system or syntax scoring system to determine the severity of CAD. Moreover, only the number of significantly diseased vessels were taken into account instead of taking into account other characteristics like the length and calcification of the diseased segments.

Conclusion

Patients with diabetes undergoing primary PCI have more advanced and severe CAD compared to patients with no diabetes.

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