



A COMPARATIVE STUDY OF CLINICAL PROFILE OF ACUTE CORONARY SYNDROME IN DIABETIC AND NON DIABETIC PATIENTS

General Medicine

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ABSTRACT

Background: Cardiovascular complications are more common among diabetic patients and are usually associated with a significantly greater risk of morbidity and mortality than in nondiabetic subjects. Presence of diabetes worsens prognosis in acute coronary syndrome (ACS). The risk of myocardial infarction (MI) is greater in diabetic persons compared to age-matched nondiabetics. It is very vital to study the spectrum of clinical presentation, risk aggregation, complications, mortality and its causes among diabetic CAD Vs non-diabetic CAD. Hence, the study was undertaken. **Aims and Objectives:** To compare the clinical profile of acute coronary syndrome in diabetic and non-diabetic patients. To study the difference in risk factors of Acute Coronary Syndrome between diabetic and nondiabetic patients. **Methodology:** 60 ACS patients with diabetes and 60 ACS patients without diabetes were included in the study based on inclusion and exclusion criteria and both the groups were compared for various clinical parameters. **Result and Conclusion:** Diabetics had a higher risk factor profile and were prone to poorer clinical outcome for ACS and considerably higher percent of typical & atypical presentation. Diabetics were more prone to silent STEMI and NSTEMI, multiple vessel disease and arrhythmias than non-diabetics.

KEYWORDS

INTRODUCTION

Diabetes mellitus is one of the commonest disease worldwide ranking next to cardiovascular disorder. The estimated prevalence of diabetes among adults is expected to rise about 100% in future. The correlation of a risk factor with development of diabetes is never 100%, but greater the risk factors present in an individual, the greater the chance of developing the diabetes mellitus. It is also called 'the disease of complications highlighting the higher mortality, morbidity & economic burden.

Type-2 diabetes mellitus has significant relationship with obesity and its relative risk is greatly increased in association with obesity. Research workers have blamed obesity and sedentary lifestyles are linked to each other and are responsible for the dramatic increase in type-2 diabetes.

Dyslipidemia is observed in practically all patients of type-2 diabetes mellitus and every high level of cholesterol in diabetics have 2-3 times higher CAD risk than non-diabetic individuals.

In patients with T2DM, even with good glycemic control, there are frequently lipid abnormalities (elevated triglycerides and non-HDL-C, decreased HDL-C, and an increase in small dense LDL).¹

The increased adipocyte mass leads to increased levels of circulating free fatty acids and other fat cell products. As a result of insulin resistance in adipose tissue, lipolysis and free fatty acid flux from adipocytes are increased and efficiently cleared by liver leading to increased very-low-density lipoprotein [VLDL]-triglyceride) synthesis in hepatocytes and secretion from liver. This is also responsible for the dyslipidemia found in type 2 DM (elevated triglycerides, reduced high-density lipoprotein [HDL] and increased small dense low-density lipoprotein [LDL] particles).¹¹

Diabetes is a disease that is strongly associated with both microvascular and macrovascular complications, including retinopathy, nephropathy, and neuropathy (microvascular) and ischemic heart disease, peripheral vascular disease, and cerebrovascular disease (macrovascular), resulting in organ and tissue damage in approximately one third to one half of people with diabetes.³

Cardiac involvement in diabetes commonly manifests as CAD and less commonly as dilated (diabetic) cardiomyopathy and autonomic cardiovascular neuropathy.

'Diabetes accelerates smooth muscle accumulation in lesions of Atherosclerosis'⁴
Nitric oxide-mediated vasodilation is impaired in non-insulin-

dependent diabetes mellitus.¹⁵

Coronary tissue from patients with diabetes exhibits a larger content of lipid-rich atheroma, macrophage infiltration, and subsequent thrombosis than tissue from patients without diabetes. These differences suggest an increased vulnerability for plaque disruption and thrombosis in patients with diabetes mellitus.⁶

The Framingham heart study assessed that patient with diabetes, particularly women exhibited an increased risk in coronary events including angina, stroke, claudication, heart failure, myocardial infarction, and sudden death.

It is very vital to study the spectrum of clinical presentation, risk aggregation, complications, mortality and its causes among diabetic CAD Vs non-diabetic CAD. Hence, the study was undertaken.

MATERIAL AND METHODS

This Observational Cross Sectional Study was carried out at Sir T General Hospital & Government Medical College, Bhavnagar.

Total 120 cases of ACS were included in the study of which 60 were also having Diabetes.

A detailed medical history of the participants including Symptomatology on presentation, Past History, Personal History, Family History, Clinical Vitals assessment, ECG patterns and Lab investigations was undertaken.

The participant was categorized into group 1 and group 2 as per the pre-decided criteria.

Group 1 included ACS patients with Diabetes (known case of diabetes or RBS >200 and HBA1C >6.5)

Group 2 included ACS patients without Diabetes. (not a known case of diabetes and RBS <200 and/or HBA1C <6.5)

Two Groups, thus generated,

- ACS patients with Diabetes (n=60)
- ACS patients without Diabetes (n=60)

were compared and statistically analyzed

Comparisons between groups were performed using student t test and chi-square test and strength of association was said to be significant if $p \leq 0.05$

Patients without ACS or not giving consent for participation in the study or with age less than 18 years or in poor general condition were not included in the study

No environmental harm was done during the implementation of the

study.

OBSERVATIONS AND RESULTS

The study consists of two groups i.e., Diabetic ACS (group-1) and Non-diabetic ACS (group-2). Group- 1 consists of 60 cases (43 males and 17 females) and group-2 consists of 60 cases (37 males and 23 females).

Table 1: Age and sex wise distribution of diabetic and non-diabetic cases of ACS

Age group (years)	Diabetic				Non-diabetic			
	Male	Female	Total	%	Male	Female	Total	%
0 - 36	0	0	0	0	0	0	0	0
36-45	5	3	8	13.3	3	1	4	6.67
46-55	12	5	17	28.33	14	11	25	41.67
56-65	14	6	20	33.33	10	5	15	25
66-75	8	2	10	16.67	6	5	11	18.33
>75	4	1	5	8.33	4	1	5	8.33
Total	43	17	60	100	37	23	60	100

In this study, highest number of patients belonged to Age Group 46 to 65 years. In Diabetics more number of patients belonged to age group 56 to 65 years while the same in non diabetics belonged to 46 to 55 years. Male to female ratio in group-1 was 2.53:1 and in group-2 it was 1.60:1.

Table 2: Chief complaints of diabetic and non-diabetic cases of ACS

Chief Complaints	Diabetic				Non-diabetic			
	Male	Female	Total	%	Male	Female	Total	%
Chest Pain	32	12	44	73.33	32	21	53	88.33
Chest Discomfort	36	13	49	81.67	27	16	43	71.67
Breathlessness	11	7	18	30	5	3	8	13.33
Perspiration	25	10	35	58.33	17	11	27	45
Palpitation	7	2	9	15	3	1	4	6.67
Nausea / Vomiting	16	8	24	40	18	10	28	46.67
Pedal Edema in addition to breathlessness	4	2	6	10	2	0	2	3.33

Chest discomfort was the chief complaint of the highest number of patients in diabetic group (81.67%) while the same in non diabetic group was chest pain (88.33%).

30% of diabetic patients had complaint of breathlessness which was significantly high as compared to non diabetics (13.33%).

Diabetics are more prone to silent MI, for experiencing significantly less complaint of chest pain (73.3% vs 88.3% of non diabetics) and experiencing altered way of presentations of clinical symptoms of myocardial ischemia/death as compared to non diabetics.

Time Of Onset Of Symptoms:

- 24 hours of a day were divided into 4 quarters: I : 00:00 – 6:00 AM
- II : 06:00 – 12:00 noon
- III : 12:00 – 06:00 PM
- IV : 06:00 – 12:00 midnight

The onset of symptoms was noted corresponding to the particular quarter to know the diurnal variation in the onset of symptoms

Diurnal variation of onset of symptoms in diabetic and non-diabetic cases of ACS

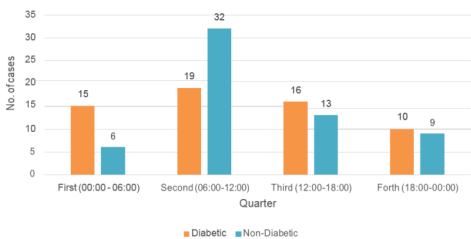


Chart 1 : Diurnal variation of onset of symptoms in diabetic and non-diabetic cases of ACS

There was a significant difference in time of onset of symptoms among diabetics and non-diabetic cases.

From this it is clear that, among diabetic group events occurred uniformly throughout the day without any diurnal variation, whereas the same in non-diabetics, there is peaking of events in late morning (6.00 AM to 12.00 Noon) following the circadian rhythm of cardiac events.

Table 3 : Smoking or tobacco chewing of diabetic and non-diabetic cases of ACS

Personal history	Diabetic				Non-diabetic			
	Male	Female	Total	%	Male	Female	Total	%
Only smoking	11	0	11	18.3333	16	0	16	26.6667
Only Tobacco Chewing	10	4	14	23.3333	7	3	10	16.6667
Both	10	0	10	16.6667	13	0	13	21.6667
Total	31	4	35	58.3333	36	3	39	65

Table 4 : Comparison of waist: hip ratio of diabetic and non-diabetic cases of ACS

Waist: Hip ratio	Diabetic				Non-diabetic			
	Male	Female	Total	%	Male	Female	Total	%
Normal (M<=1.0) (F<=0.85)	12	4	16	26.67	16	8	24	40
High (M>=1.0) (F>=0.85)	31	13	44	73.33	21	15	36	60
Total	43	17	60	100	37	23	60	100

Thus, Smoking and Tobacco chewing were commonly seen in both diabetic & non-diabetic groups. But statistically comparing, tobacco chewing was equally common to both but smoking showed significant difference among both the groups. This shown that smoking was one of the significant risk factors apart from diabetes.

Central obesity (increased W:H ratio) was commonly seen with diabetics than non diabetics.

Moreover, >75% of the patients in both the groups had high total cholesterol levels. Twice the number of patients in diabetic group as compared to the non diabetic group had low HDL levels. 58.33% of diabetic group and 71.67% of non diabetic group had high LDL levels.

Distribution of type of ACS in diabetic and non-diabetic cases of ACS

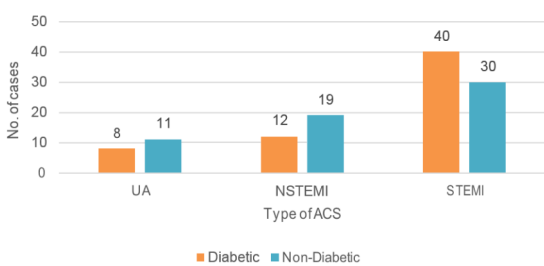


Chart 2 : Distribution of type of ACS in diabetic and non-diabetic cases of ACS :

Table 5 : Pattern of STEMI in diabetic and non-diabetic cases of ACS

STEMI	Diabetic (n = 40)		Non-diabetic (n = 30)	
	Total	%	Total	%
IWMI	7	17.50	7	23.33
IWMI +RV	12	30.00	4	13.33
AWMI	9	22.50	8	26.67
LWMI	4	10.00	5	16.67
A + LWMI	8	20.00	6	20.00

Table 6 : Arrhythmias in diabetic and non-diabetic cases of ACS

Arrhythmia	Diabetic (n = 22)		Non-diabetic (n = 14)	
	Total	%	Total	%
VPC	10	45.45	7	50.00
APC	4	18.18	3	21.43
RBBB	2	9.09	1	7.14
LBBB	1	4.55	0	0.00
ST	5	22.73	3	21.43

Higher number of diabetics showed Multiple Vessel Disease - STEMI/NSTEMI and Arrhythmias than non diabetics.

SUMMARY AND CONCLUSION

Diabetics had considerably higher percent of typical & atypical presentation. Hence, ACS should be considered as one of the differential diagnoses in diabetics who have presented with chest pain, however less severe it may be or even if it is absent with presence of other relevant atypical symptoms. Diabetics have a higher risk factor profile and are prone to poorer clinical outcome for ACS and hence they should be observed keenly for complications.

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