International Journal of Health Sciences and Research
Vol.13; Issue: 10; October 2023
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

A Study to Observe the Clinical and Angiographic Profile of Diabetic and Nondiabetic Acute Coronary Syndrome (ACS) Patients Admitted in the Department of Cardiology of a Tertiary Care Hospital in Kolkata

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DOI: https://doi.org/10.52403/ijhsr.20231002

ABSTRACT

Background: A large body of literature documents that diabetes is an independent risk factor for cardiovascular diseases (CVD) in both men and women. Diabetic female seem to lose their inherent protections against developing CVD. CVDs are listed as the cause of death in 65% of persons with diabetes. Not only coronary artery diseases (CAD), diabetes acts as an independent risk factor for several other forms of CVD. Moreover, patients with diabetes have worse prognosis compared to their nondiabetic counterpart.

Aims & Objectives:

The aim of this study was-

To observe clinical and angiographic profile of diabetic and nondiabetic acute coronary syndrome (ACS) patients

To observe the difference between baseline characteristics, clinical profile and angiographic profile of these patients

Methods:

Study Area: Department of Cardiology, Tertiary Care Hospital in Kolkata

Study Population: Patient diagnosed as a case of acute coronarysyndrome and admitted to cardiology ward of the Hospital.

SAMPLE SIZE: 637 consecutive patients, admitted to department of cardiology were selected for this study

Results: About one third patients in our study were diabetic. Compared to non-diabetic, these diabetic patients were older. Women patients were more in case of diabetic.STEMI and UA as presentation was more common amongst diabetic female. Prognosis of female ACS were also bad compared to their male counterpart. Hypertension, Dyslipidemia in the form hypertriglyceridemia, renal insufficiencywas significantly more common among diabetics whereas smoking and familyhistory of premature CAD were more common in nondiabetic patients. Atypical manifestation was more common among diabetic population which might be thereason of delayed presentation among diabetic patients. Less number of diabetic patients presented within the time period of thrombolysis. Compared to nondiabetic, diabetic patients had higher in hospital mortality, cardiogenic shockor heart failure. Higher in-hospital mortality could be predicted by higher admission hyperglycemia. Double and triple vessel disease were more common among diabetic patients. higher the HBA1c value, more was the chance of triplevessel involvement. Left main involvement was more common in diabetic population, however chronic total occlusion rates were same.

Keywords: ACS, CVD, Diabetes

INTRODUCTION

Cardiovascular diseases (CVDs) are leading cause of death globally. In 2012, there was an estimated 17.5 million death from CVDs which represented around one third of all global deaths. Amongst these 7.4 million are due to coronary artery diseases (CAD). Majority of these death takes place low- and middle- income countries. Death below age 70 due to non-communicable diseases (NCD) [around 82%] occur mainly in low- and middle-income countries and CVDs are the major culprit. (Cause 37% of death). Most of these CVD s can be prevented by Risk factor modification using population wide strategies. At the same time, early detection and management is needed for secondary prevention of these patients who are at high risk due to presence of multiple risk factors

A large body of literature documents that diabetes is an independent risk factor for CVD in both men and women. Diabetic female seems to lose their inherent protections against developing CVD. CVDs are listed as the cause of death in ≈65% of persons with diabetes**.** Not only CADs, diabetes acts as an independent risk factor for several other forms of CVD. Moreover, patients with diabetes have worse prognosis compared to their nondiabetic counterpart

Several previous studies have shown that diabetics have higher mortality and morbidity rates compared to nondiabetics after an acute myocardial infarction (AMI). These differences cannot be attributed to a larger infarct size, since studies carried out in the past, have demonstrated that diabetes do not cause increased myocardial damage. Moreover, studies conducted previously, revealed that diabetes remains a major risk factor for poor short and long-term outcome even after thrombolytic therapy. Regarding the prognosis of diabetics with unstable angina or non-Q-wave myocardial infarction (MI), only few studies have been conducted. Most of these studies demonstrated that diabetes predicts a worse outcome after an episode of unstable coronary artery disease and others reported no difference. Information relating the prognostic value of diabetes in patients with all clinical presentation of acute coronary syndrome (ACS) is limited, while studies investigating the impact of diabetes in severity of acute coronary syndrome are lacking. Furthermore, most previous studies have evaluated diabetic population as one group, although it has been shown that the short- and long-term prognosis of diabetics with AMI is related to the antidiabetic treatment.

Aims & Objectives

The aim of this study was to observe clinical and angiographic profile of diabetic and nondiabetic acute coronary syndrome (ACS) patients

Specific Objectives

- To observe the difference between baseline characters of these patients.
- To observe the difference between clinical profile (in hospital course) of these patients.
- To observe the difference between angiographic profile of these patients.

MATERIALS & METHODS

Study Area: Department of Cardiology, Tertiary Care Hospital in Kolkata

Study Population: Patient diagnosed as a case of acute coronary syndrome and admitted to cardiology ward of the Hospital.

Sample Size:

637 consecutive patients, admitted to department of cardiology were selected for this study. Amongst these 200 patients were diabetic & 437 were nondiabetic. Written consent was taken from each patient and

their relatives and studied according to proforma.

Sample design:
Inclusion Criteria:
All newly diagnosed ACS patients were selected for this study. ACS includes STEMI, NSTEMI, UA

Exclusion Criteria
1. Patient who did not give consent for angiography, angioplasty or thrombolysis
2. Patient presented with chest pain within 1 year of coronary angioplastyor CABG
3. Low risk unstable angina (TIMI score less than 2)

Study Design:
Institution based observational comparative study

1. **Parameters to be studied**
2. FBS, PPBS
3. Urea, creatinine
4. HBA1c
5. Fasting lipid profile
6. ECG/ Echocardiogram
7. CPK/ CPK MB
8. c Troponin
9. TMT
10. CAG

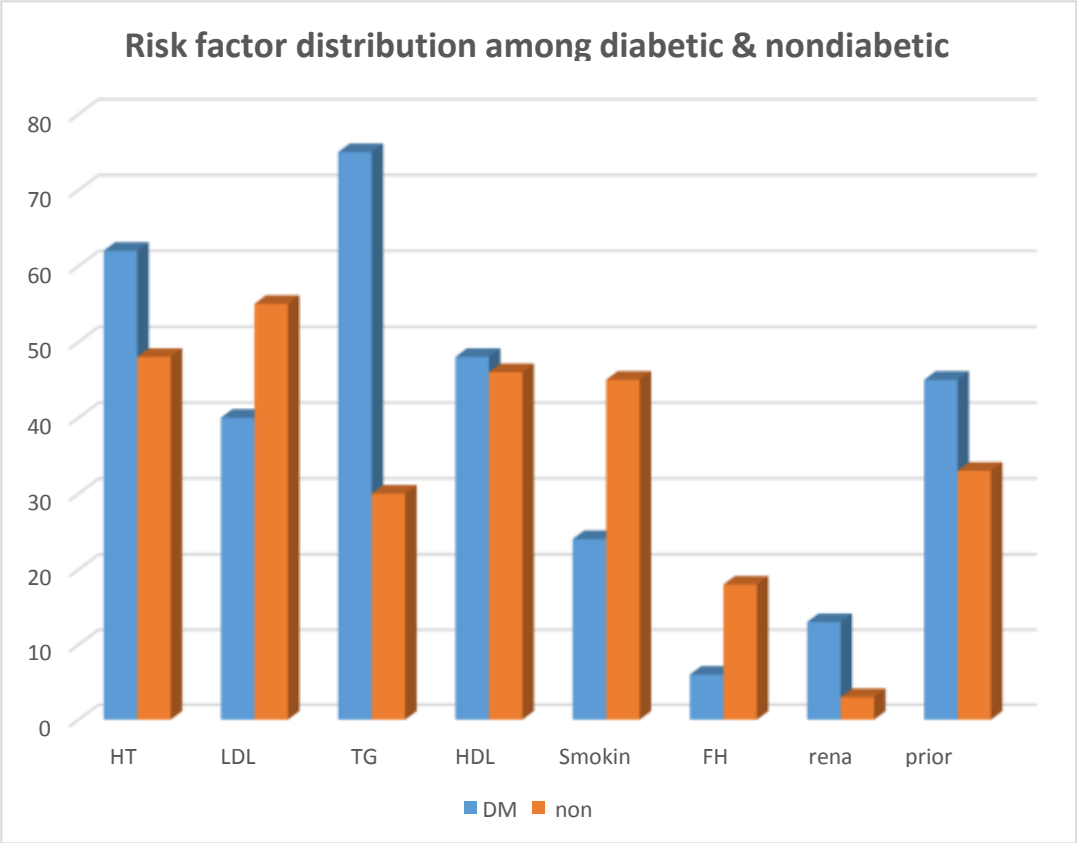
Study Tools:
A structured validated proforma was used to collect data from these patients Following details are collected from each patient
Baseline data including age and sex Detail clinical examination
Lab investigations
ECG & echocardiogram
TMT if neededCAG
Each enrolled candidates were meticulously examined and relevant clinical history were taken
Relevant clinical History & physical examination Clinical history was needed to establish the diagnosis to determine risk factors to know the complications occurred during in hospital stays

RESULT

637 consecutive ACS patients who were admitted to our hospital from cardiology OPD & emergency are selected for this study. Amongst which 200 patients were diabetic and 437 patients were nondiabetic. So, 31.39% of ACS patients were diabetic.

Age distribution
Mean age of distribution amongst diabetic patients were 64.8 ± 8.4 yrs. Mean age of distribution amongst non-diabetic patients were 55.8 ± 7.2 yrs Pvalue .0001
Youngest patient in diabetic group was 39 years and oldest patient was 81 yrs
Youngest patient in non-diabetic group was 34 years and oldest patient was 85yrs

RISK FACTOR distribution amongst diabetic & nondiabeticACS groups
Amongst 200 diabetic ACS Patients 124 (62%) had associated hypertension, 150 patients (75%) had increased triglyceride, 80 patients (40%) had increased LDL C, 96 patients (48%) had decreased HDL C , 26 patients (13%) had renal insufficiency, 48 patients(24%) had smoking history , 12 patients(6%) have family history of premature CAD, 90 patients(45%) have history of prior CAD or peripheral arterial disease. 4 patients (2%) had no additional risk factor otherthan diabetes and 9 patients (4.5%) had all the risk factors (diabetes, hypertension, dyslipidemia and smoking).
Amongst 437 nondiabetic patients 210 patients (48%) patients were hypertensive, 240 patients (55%) had increased LDLc, 131 patients (30%) had increased triglycerides, 201 (46%) had decreased HDL c, 13 patients (3%) had renal insufficiency, 197 patients (45%) had smoking history, 79 patients (18%) had family history of premature CAD, 144 patients (33%) had prior history of CAD or peripheral arterial disease. 35 patients (8%) have no riskfactors,



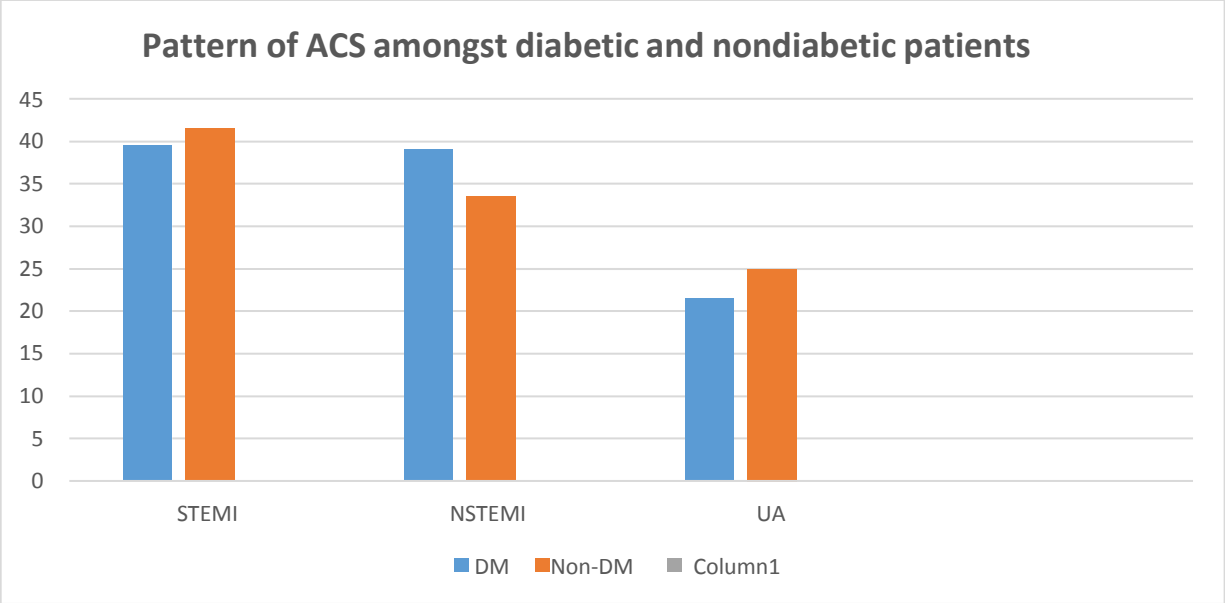
Pattern of ACS among diabetic and nondiabeticpopulation

Pattern of ACS among diabetic and nondiabetic population were shown below

	Diabetic(n=200)		Nondiabetic(n=437)	
	Male	Female	Male	female
STEMI	50 (25%)	29 (14.5%)	138 (31.5%)	44 (10%)
NSTEMI	54 (27%)	24 (12%)	109 25	36 8.5
UA	27 (13.5%)	16 (8%)	78 17.5%	32 7.5%

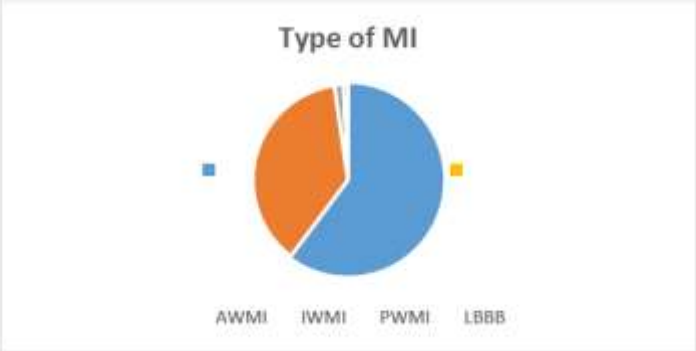
In diabetic subgroup 39.5% patients have STEMI, 39% have NSTEMI,21.5% patients have UA. Among STEMI population 36.7% patients were female. Among NSTEMI it is 30.76% and amongst UA it is 39.5%. Total 69% (34.5%) patients were female among 200 diabetic ACS

In nondiabetic subgroup, 41.5% patients have STEMI, 33.5% patients have NSTEMI, 25% patients UA, Amongst STEMI 24% patients were female, amongst NSTEMI it is 25.37%, amongst UA it is 30%. Total 437 patients were female amongst 437 nondiabetic ACS



Type of STEMI

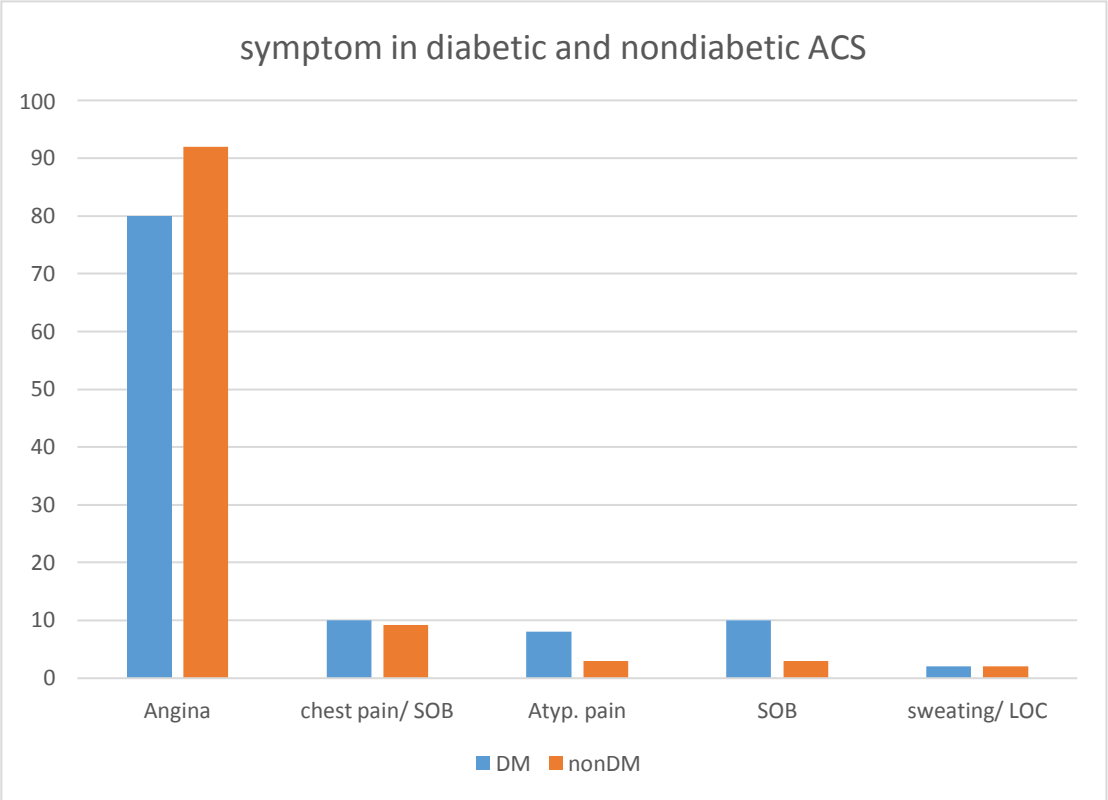
Amongst 261 STEMI patients 157 patients were of AWMI. 98 IWMI, 4 Patients true Posterior wall MI, 2 patients were of LBBB



Presenting symptom amongst diabetic and nondiabeticACS population

Amongst diabetic population 140 patients (70%) presented with angina chest pain, 20 patients (10%) presented with chest pain and dyspnoea, 16 patients (8%) presented with atypical chest pain, 20 patients (10%) presented with dyspnoea, 4 patients (2%) presented with sweating and loss of consciousness

Amongst non-diabetic population 362 patients (82.84%) presented with anginal pain, 40 patients presented with chest pain and dyspnoea (9.15%) 13 patients (3%) presented with atypical chest pain, 13 patients (3%) presented with dyspnoea, 9 patients (2%) presented with sweating and loss of consciousness



Time of presentation of STEMI

Amongst diabetic patients 79 patients were having STEMI. Amongst nondiabetic patients 182 patients were having STEMI. Mean time of presentation in diabetic group 16.76± 4.23 hrs Amongst nondiabetic group it is 12.58± 4.78 hrs

P value is 0.0001

So, time of presentation in diabetic STEMI were significantly delayed.

Time of Presentation		
	% of patients	
	DM	Non-DM
< 6 hrs	19	21.97
6-12 hrs	30.35	32.96
12-24 hrs	35.45	30.25
> 24 hrs	15.2	14.25

Among diabetic patients 15, 24, 28, 12 patients presented within < 6 hrs, 6-12 hrs, 12-24 hrs, > 24 hrs respectively. Among non-diabetic patients 40,60,56, 26, patients presented within < 6 hrs, 6-12 hrs, 12-24 hrs, > 24 hrs respectively.

Thrombolysis

Amongst these ACS patients, 39 diabetic (out of 79 patients) and 100 nondiabetic patients (out of 182 patients) were presented within 12 hrs, 1 patient from diabetic group and 2 patients from nondiabetic group were not thrombolysed due to previous hemorrhagic stroke. 4 patients from diabetic group and 9 patients from nondiabetic group were thrombolysed in spite of delayed presentation due to persistent chest pain and dynamic ST-T changes.

So, 149 patients out of 261 patents (57%) were thrombolysed Out of 149 patients, 30 patients received thrombolysis with Tenec teplase 119 patients received thrombolysis with streptokinase 3 patients from TNK group and 9 patients from STK group suffered majorbleed.

Most of these major bleeds are intracerebral haemorrhages except 1 patient who received STK developed groin hematoma and died.

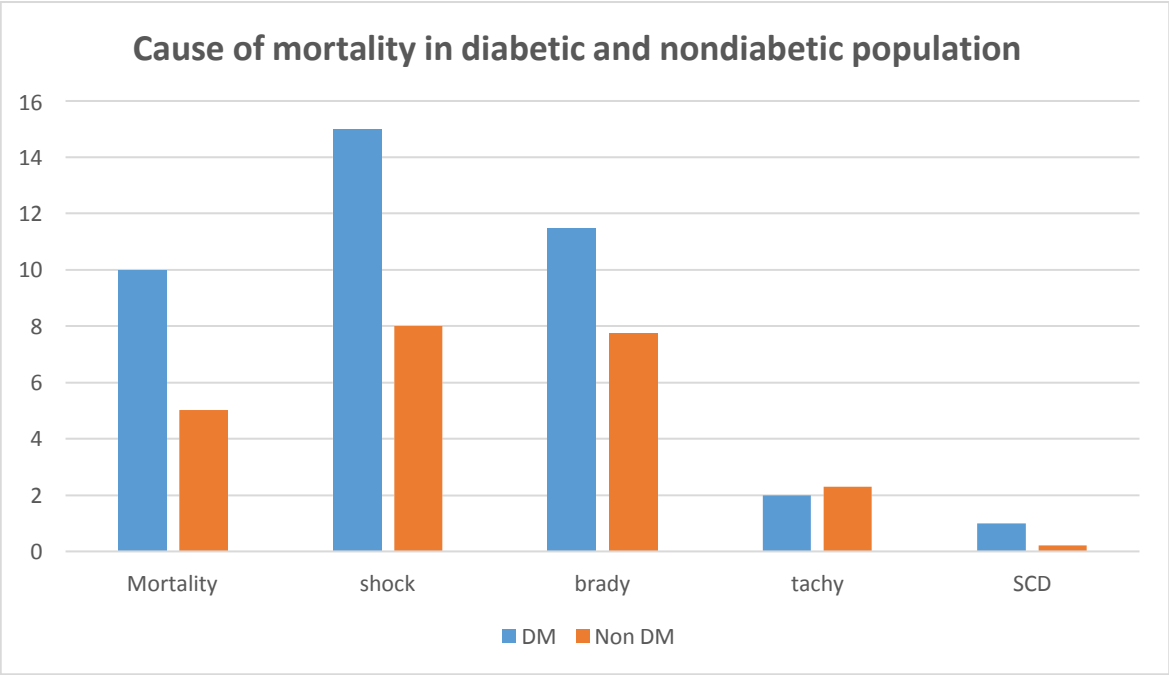
In hospital mortality

25 patients from STEMI died, 10 from bleeding, 4 due to bradyarrhythmia, 2 from SCD, 8 due to cardiogenic shock.

12 patients from NSTEMI died, 9 from cardiogenic shock, 2 tachyarrythmia, 1 from SCD

5 patients from unstable angina died, 4 from cardiogenic shock, 1 due to tachyarrythmia

Other presentation was at presentation heart failure, cardiogenic shock, bradyarrythmia, tachyarrythmia & SCD



Mortality due to Acute Coronary syndrome		
	DM	**Non-DM**
Bleeding	3	7
Cardiogenic shock	10	11
tachyarrythmia	3	1
Bradyarrythmia	2	2
Sudden cardiac arrest	2	1
Total	20	22

Total ACS patients were divided into two groups Group 1 : Admission blood sugar less than 140 mg/dl Group 2: admission blood sugar more than 140 mg/dl

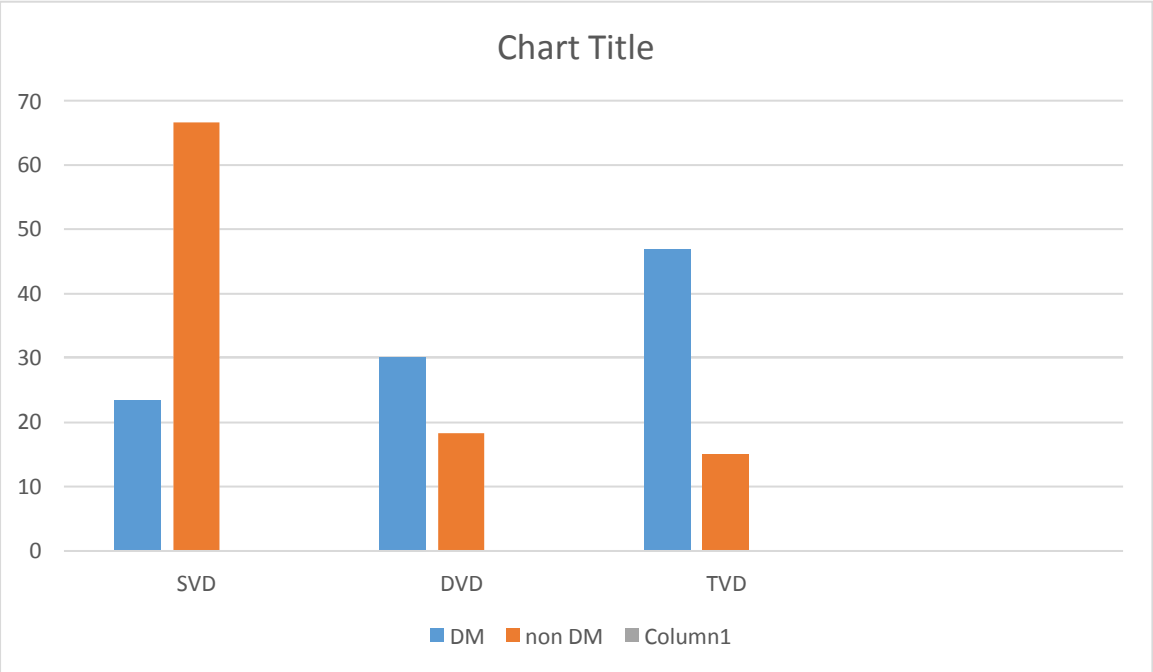
Other presentation

	DM	**Non-DM**	**ODDS ratio**	**ConfidenceInterval**
At presentationheart faliure	40(20%)	53(12.12%)	1.18	1.15- 2.88(p value 0.009)
Cardiogenicshock	30	35	2.02	1.2-3.4(p value 0.007)
Tachyarrythmia	4	10	0.87	0.27-2.81(p value 0.8179)
Bradyarrythmia			1.16	0.68-1.98(p value 0.58)
Inf. MI				
Sinusbradycardia	13	29		
High grade AVblock	8	14		
Ant. MI				

High grade AVblock	**2**	**1**		
SCD	2	1	4.4	0.39- 48.85(p value 0.22)

Coronary angiography was done in 179 DM patients and 414 non-DM patients Amongst diabetic patients 42 patients revealed SVD, 54 DVD, 84 TVD Amongst nondiabetic patients 276 patients revealed SVD, 76 DVD, 62 TVD

Diabetic patients were divided according to their HBA1c level, proportion of SVD, DVD, TVD were shown on chart



HBA1c	SVD	DVD	TVD	TOTAL
< 7%	16	6	2	24
7-8.5%	11	18	13	42
>8.5%	15	30	69	114

Comparing three groups (divided on basis of HBA1c level) with ANOVA showed that higher HBA1c is associated with more TVD(P=.0001 x^2= 42.02df=4)

CORONARY ANGIOGRAPHY

Pattern of vessel involvement

Angiography was done in 179 diabetic patients & 414 nondiabetic patients. Total 614 vessels were involved in nondiabetic patients

402 vessels were involved in diabetic patients

In 41% of cases LAD was involved (440 out of 1016) In 34% of cases RCA was involved (338 out of 1016)

In 25% of cases LCX was involved. 248 out of 1016) PTCA was done to 80 out of 179 diabetic patients (44.69%)

In nondiabetic 302 out of 414 patients underwent PTCA (72.94%)

LMCA involvement

Amongst diabetic patients 12 patients (6.7%) had LMCA involvement. Amongst nondiabetic patients 9 patients (2.17%) had LMCA involvement.

Chronic Total Occlusion

10 patients had CTO (5.5%) amongst diabetic patients. 20 patients had CTO amongst nondiabetic patients

DISCUSSION

In our study about one third (31%) patient was diabetic. In Kerala ACS REGISTRY[1] about 37.6% patient is diabetic. In CREATE registry 30.4% patients were diabetic.[2] In

interheart study diabetes was significantly associated with risk of myocardial infarction.[3]

Amongst diabetic patients' majority were of 60-70 years age group. Whereas amongst nondiabetic population majority were from 50-60 years age group. Mean age in diabetic population was 64.8±8.4 years which was significantly higher than mean age (55.8±7.2 years) in non-DM patients. Mean age in all ACS patient is 58.62 (SD 8.5) So compared to nondiabetic, diabetic ACS were older. Mean age in STEMI patients is less than UA/ NSTEMI patients irrespective of their diabetes status. In Kerala ACS REGISTRY there is no intergroup difference but in CREATE ACS registry there is significant intergroup difference between STEMI& UA/ NSTEMI.[1,2] Other clinical trials also showed the same clinical difference. Another important thing was around 2.5 % patient in this ACS group was below 40 years of age. Around 9% patient was below 45 years. Majority of these patients had smoking as risk factor not diabetes. Study by Lamm et al showed incidence of 4% young AMI, whereas CASS registry showed an incidence of 5%. Smoking was the prevalent risk factor amongst these patients and outcome was satisfactory when treated timely. Unlike diabetic population often these group of patients demonstrate single vessel disease or nonobstructive coronary artery disease. In our study also these ACS patients with smoking as their risk factor were younger, they mostly had single vessel disease and good outcome when thrombolysed timely or subjected to PTCA.

34.5% patients in diabetic group were female compared to 25.62% patients in nondiabetic group. Diabetic female was more likely to have unstable angina or STEMI, instead of NSTEMI. In hospital mortality was higher in diabetic female.

A meta-analysis of 11 pooled TIMI trial showed that diabetic patients with ACS had greater prevalence of hypertension, dyslipidemia and increased abdominal obesity.[4] However smoking and family history were less prevalent. These risk factors were more common in nondiabetic young AMI. In our study hypertension is more common as risk factor in diabetic (62% vs 48%). Hypertriglyceridemia is also common amongst diabetic (75% vs 40%). LDLc was less among diabetic group. (45% vs 24%) HDL level was comparable (48% vs 46%). This is due to presence of atherogenic small dense LDL. Family history was less common among diabetics (18% vs 6%) and smoking was more common amongst nondiabetic (45% vs 24%). Gender bias may be a predisposing factor for this type of risk distribution. Hypertriglyceridemia is due to problem in carbohydrate metabolism. Obesity and insulin resistance are causative factors for type 2 DM. prior history of coronary artery disease or coexistence of peripheral arterial disease was seen in our study as well as previous study, due to same atherosclerotic involvement of vasculature of different parts of body. Renal insufficiency as measured by creatinine clearance was more common in diabeticpatients (13% vs 3%) due to diabetic nephropathy.

STEMI was the commonest manifestation in both diabetic and nondiabetic subsets, accounting for 39% and 41 % cases respectively. This finding is at par with KERALA ACS registry where 37% patients were of STEMI but unlike CREATE registry where 60% patients were of STEMI. In DEMAT registry, 54% patients were of STEMI. Compared to nondiabetic, percentage of NSTEMI was more in diabetic. Aging of the US population with increasing no of diabetes and chronic kidney disease increased number of NSTEMI in this population. Diabetes increased the chance of triple vessel disease and hence NSTEMI. Out of 261 AMI patients 79 were diabetic and 182 were nondiabetic. 60% patients had anterior wall MI, 37.5% had IWMI, 4 patients had true posterior wall MI, posterior wallMI were suspected in the basis of prominent r wave in V1 and ST depression in V1. It was confirmed by

presence of ST elevation in V7, V8, V9. New onset LBBB was present in 2 patients and diagnosis of AMI was confirmed by Sgarbosa criteria. So anterior wall MI is the commonest presentation of STEMI like other studies done by Wander et al and Manjunath et al. according to their study anterior wall involvement was about 2/3 rd cases

Study done by Pitsavas et al showed that overall, in-hospital mortality rate was significantly higher in diabetics compared to nondiabetics with an un-adjusted OR = 2.9 (95% CI: 1.74–4.83, however this in-hospital mortality rate was mainly significant for diabetic patients with STEMI. Diabetes mellitus is associated with a bad prognosis in patients with ACS. However, after adjustment of all the confounding variables like age, sex, smoking habits, body mass index, history of coronary heart disease, CPK-MB as well as the blood pressure levels at the admission and the administration or not of thrombolytic therapy (only when the analysis was performed in patients suffering from STEMI). The overall likelihood of dying was almost 2.5 times higher in diabetics compared to nondiabetics while among patients with STEMI, the odds of dying was almost six times higher in diabetics compared to nondiabetics. Moreover, when subdivided according to the antidiabetic treatment, though all subgroups of diabetic patients had higher in-hospital mortality compared to nondiabetic, diabetics treated with insulin continued to have a higher risk of dying compared to nondiabetics (OR = 5.6, 95% CI: 1.6–19.2 The more prolonged prehospital delay, the increased age and the female sex of patients with diabetes may account for the lesser use of thrombolytic agents in these patients.

Data from 11 pooled TIMI trial showed that mortality was significantly higher among patients with diabetes than among patients without diabetes at 30 days following either UA/NSTEMI or STEMI. The unadjusted 30-day mortality risk for patients with diabetes was consistently higher than for patients without diabetes across key subgroups in the UA/NSTEMI and STEMI cohorts. Patients older than 75 years, with Killip classes 2-4, decreased creatinine clearance, and increased TIMI risk index had the highest absolute mortality at 30 days regardless of whether they had STEMI or UA/NSTEMI. There was no significant interaction between diabetes status and type of ACS at 30 days. There was also no significant difference in 30-day mortality between patients with diabetes taking insulin and those not taking insulin before ACS among both STEMI (7.8% vs 8.7%, *P* = .26)and UA/NSTEMI (2.4% vs 1.8%, *P* = .31) cohorts. After multivariable modelling, the independent risk conferred by diabetes at 30 days among patientswith UA/NSTEMI was higher (OR, 1.78; 95% confidence interval [CI], 1.24- 2.56) than among patients with STEMI (OR, 1.40; 95% CI, 1.24-1.57). Results were similar with the inclusion of body mass index, Killip class, known prior hyperlipidaemia, or a term for the individual trial interventions in the model. In Our study in hospital mortality was significantly was significantly higher in diabetic patients. And mortality amongst STEMI patients was much higher than NSTEMI or UA. 25 patients from STEMI died, 10 from bleeding, 4 due to bradyarrythmia, 2 from SCD, 8 due to cardiogenic shock. 12 patients from NSTEMI died, 9 from cardiogenic shock, 2 tachyarrhythmia, 1 from SCD 5 patients from unstable angina died, 4 from cardiogenic shock, 1 due to tachyarrhythmia. So, a good number of patients died from STEMI during thrombolysis due to bleeding complication. Hence inappropriate thrombolysis must be avoided and contraindications should be kept in mind. Same result was shown in Kerala ACS registry. In our study around 15 % of patients got thrombolysis with tenecteplase which is higher than CREATE registry. (3.8%) Intracranial haemorrhage with tenecteplase was higher than

streptokinase. However, bleeding rates were comparable amongst diabetic and nondiabetic. Cardiogenic shock and ventricular tachycardia as cause of death were significantly common amongst diabetic ACS patients.

LV dysfunction was more common in STEMI than NSTEMI/ UA, Though LV function did not differ much between diabetic and nondiabetic STEMI patients but this difference is significant in NSTEMI/ UA. Significantly a greater number of diabetic patients presented with heart failure, cardiogenic shock was significantly common amongst diabetic. However, bradyarrythmia and tachyarrythmia, SCD rates were same.

Reports from GRACE REGISTRY showed that regardless of the type of ACS, patients with diabetes were significantly more likely to develop heart failure during the acute hospitalization.[5] While the statistical significance of the associations observed differed according to the type of ACS, patients with diabetes were also more likely to experience cardiogenic shock and/or renal failure, and to die during the acute hospitalization. Irrespective of prehospital delay (<2 hours, 2-5.9 hours, or ≥6 hours), diabetic patients were at increased risk for each of the adverse outcomes examined compared with patients without diabetes. Diabetic cardiomyopathy or autonomic failure may be responsible for this increased incidence of heart failure.

According to different reported studies, around 20-50% of patients presented with admission hyperglycaemia. (3, 20, 21, 22) This wide range could be due to contribution of undiagnosed diabetes in hyperglycaemia in non-diabetic patients, Oswald et al shows that one fifth of patient with presumed stress hyperglycaemia have undiagnosed diabetes. (23) Admission hyperglycaemia was not related to age, gender or BMI in both diabetic & non-diabetic patient in majority of studies, however in many other studies individuals with higher admission glucose were older, heavier, and more often female. (24, 25). Nationwide French study showed that admission hyperglycaemia was also independent of other risk factors like hypertension and dyslipidaemia (25). Admission hyperglycaemia was significantly more common in patients with STEMI compared to those with NSTEMI/UA in non-diabetic but not in diabetic group, this could be due to more stimulation of sympathetic nervous system & raised production of the catecholamines in patient with more severe disease in non-diabetic patients, while in diabetics many patients with milder disease might have hyperglycaemia due to already poorly controlled diabetes. As per different studies severity of ACS and

size of infarct is related to degree of hyperglycaemia. (13,14) The outcome of diabetic patients sustaining an ACS is poor, compared with that of non-diabetic patients, mainly because chronic metabolic derangement and its microvascular disease in diabetic patients, and diabetic patients were significantly more liable for heart failure & recurrent ischemic attack, Mortality was significantly higher in case of diabetic ACS population. (3, 11, 27) several potential explanations exist for this finding, some hyperglycaemic patients without known diabetes likely have diabetes that was not treated before hospitalization; these patients may, therefore, represent a higher-risk patients. Furthermore, the patients without known diabetes are much less likely to be treated with insulin than those with diabetes, and finally, it is also possible that a higher degree of stress (or severity of illness) is required to produce a similar degree of hyperglycaemia in patients without known diabetes than in those with diabetes. (11) These findings highlight an important potential opportunity to improve care and outcomes for hyperglycaemic ACS patients without known diabetes. There are several studies which showed that hyperglycaemia on admission was associated with increased incidence of

arrhythmias (28,29), Admission hyperglycaemia was better prognostic marker than 2nd day FPG The admission blood glucose is better reflection of the degree of stress and thus the severity of ACS as the patient receives multiple drugs after admission including insulin that may alter the blood glucose, secondly, glucose levels generally decrease during the first 24 hours of hospitalization, which likely represents the amelioration of the acute stress response.(24) our study also showed higher in hospital mortality in patients with admission hyperglycaemia and this is consistent with other reports.

Delayed presentation is also responsible for adverse outcome in diabetic patients. Delayed presentation is mainly due to atypical symptoms among diabetics. In our study 80% compared to 92 % in nondiabetic presented with typical angina or angina with dyspnea, rest were with atypical presentation in the form of dyspnoea only or sweating or loss of consciousness. Diabetic autonomic neuropathy may be responsible for this. Survey from national registry of myocardial infarction 2 points toward four important causes of myocardial infarction without chest pain. These are elderly patients, prior heart failure, women, and diabetes mellitus. Presentation to the hospital was delayed by more than 2 hours for these MI patients without chest pain in comparison with delay times for patients with chest pain. Furthermore, after arriving at the hospital, patients without chest pain were less likely to be recognized as having an MI, and were less likely to receive therapy known to improve survival, such as thrombolysis or primary angioplasty (among eligible candidates), aspirin, β-blocker therapy, or heparin. Also, MI patients without chest pain were significantly less likely to receive a timely ECG or reperfusion strategies. Patients who experienced MI without chest pain had more than a 2-fold increased risk of in-hospital death than MI patients who presented with chest pain, even after adjusting for differences in clinical presentation characteristics. In our study also delayed presentation of diabetes was responsible for lower rate of thrombolysis

When coronary angiography was done, more patients with diabetes have double or triple vessel disease in our study compared to nondiabetic population. When divided according to level of HbA1c, patients with value more than 8.5% had higher chance of getting triple vessel disease as compared to patients with HBA1c less than 7%. Framingham heart study showed that multivessel disease was more common in diabetic patients with diabetes duration more than 10 years.[7] Study by Engoren et al showed that patients with higher value of HBA1c required CABG as their treatment options. Complex coronary lesions were also more common among diabetic population. Left main coronary artery involvement, chronic total occlusion and diffuse lesions are more common in diabetics. However, in our study we found that left main involvement was significantly common among diabetic but chronic total occlusion were almost same.

CONCLUSION

About one third patients in our study were diabetic. Compared to non-diabetic, these diabetic patients were older. Women patients were more in case of diabetic. STEMI and UA as presentation more common amongst diabetic female. Prognosis of female ACS were also bad compared to their male counterpart. Hypertension, Dyslipidemia in the form hypertriglyceridemia, renal insufficiency was significantly more common among diabetics whereas smoking and family history of premature CAD were more common in nondiabetic patients. Atypical manifestation was more common among diabetic population, this might be the reason of delayed presentation among diabetic patients. Less no of diabetic patients presented with in the time period of thrombolysis. Compared to nondiabetic, diabetic patients had higher in hospital mortality, cardiogenic shock or heart failure.

Higher in hospital mortality cold be predicted by higher admission hyperglycemia. Double and triple vessel disease were more common among diabetic patients. higher the HBA1c value, more was the chance of triplevessel involvement. Left main involvement was more common diabetic population. however chronic total occlusion rates were same

Declaration by Authors

Ethical Approval: Approved
Acknowledgement: None
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Mohanan PP, Mathew R, Harikrishnan S, Krishnan MN, Zachariah G, Joseph J, Eapen K, Abraham M, Menon J, Thomas M, Jacob S, Huffman MD, Prabhakaran D; Kerala ACS Registry Investigators. Presentation, management, and outcomes of 25 748 acute coronary syndrome admissions in Kerala, India: results from the Kerala ACS Registry. Eur Heart J. 2013 Jan;34(2):121-9. doi: 10.1093/eurheartj/ehs219. Epub 2012 Sep 7. PMID: 22961945; PMCID: PMC3538274
2. Xavier D, Pais P, Devereaux PJ, Xie C, Prabhakaran D, Reddy KS, Gupta R, Joshi P, Kerkar P, Thanikachalam S, Haridas KK, Jaison TM, Naik S, Maity AK, Yusuf S; CREATE registry investigators. Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data. Lancet. 2008 Apr 26;371(9622):1435-42. doi: 10.1016/S0140-6736(08)60623-6. PMID: 18440425.
3. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigos J, Lisheng L; INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet. 2004 Sep 11-17;364(9438):937-52. doi: 10.1016/S0140-6736(04)17018-9. PMID: 15364185
4. De Vita M, Burzotta F, Biondi-Zoccai GG, Lefevre T, Dudek D, Antoniucci D, Orrego PS, De Luca L, Kaltoft A, Sardella G, Zijlstra F, Isshiki T, Crea F. Individual patient-data meta-analysis comparing clinical outcome in patients with ST-elevation myocardial infarction treated with percutaneous coronary intervention with or without prior thrombectomy. ATTEMPT study: a pooled Analysis of Trials on ThrombEctomy in acute Myocardial infarction based on individual PatienT data. Vasc Health Risk Manag. 2009;5(1):243-7. doi: 10.2147/vhrm. s4525. Epub 2009 Apr 8. PMID: 19436647; PMCID: PMC2672436.
5. Tang EW, Wong CK, Herbison P. Global Registry of Acute Coronary Events (GRACE) hospital discharge risk score accurately predicts long-term mortality post-acute coronary syndrome. Am Heart J. 2007 Jan;153(1):29-35. doi: 10.1016/j.ahj.2006.10.004. Erratum in: Am Heart J. 2007 Nov;154(5):851. PMID: 17174633.

How to cite this article: Supratip Kundu, Bappaditya Kumar, Somnath Mukhopadhay. A study to observe the clinical and angiographic profile of diabetic and nondiabetic acute coronary syndrome (ACS) patients admitted in the department of cardiology of a Tertiary Care Hospital in Kolkata. *Int J Health Sci Res.* 2023; 13(10):8-20. DOI: *10.52403/ijhsr.20231002*

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