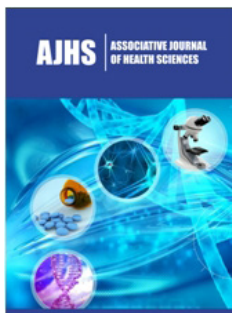



# Prevalence of Acute Coronary Syndrome among Diabetic Patients Admitted to Al-Wahdah Teaching Hospital, Yemen

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## Abstract

**Background:** According to American heart association, coronary artery diseases are the leading cause of mortality and morbidity among diabetic patients. Although is more often silent in patients with diabetes but it usually manifests later on as heart failure.

**Aim:** this study aimed to determine the prevalence of acute coronary syndrome and associated risk factors among diabetic patients admitted to AL-Washday teaching hospital, Dharma Governorate, Yemen.

**Methods:** All patients admitted to Al-Washday teaching hospital with acute coronary syndrome on top of diabetes mellitus in the last two years 2020-2021. All patients are subjected to clinical evaluation, baseline ECG, results of laboratory investigations and treatment strategies.

**Result:** In our study, the overall prevalence of coronary artery diseases among diabetic patients is 24.5% (53). Analysis of risk factors reveals most patients were hypertensive 66%, also many patients had other risk factors such as Khat chewing 47%, smoking 21%, and Shammah 7.5% which farther aggravates the risk. It also shows that the prevalence of STEMI 34%, NSTEMI 19%, and unstable angina 26%, other patients present with AF, LVH, and non-specific ST segment and T wave changes.

**Conclusion:** we could be concluded that the prevalence of coronary artery diseases among diabetic patients estimated to be 24.5%. Most patients with acute coronary syndrome were hypertensive 66% and increased rate if silent acute coronary syndrome. acute coronary syndrome in Yemeni individuals with DM was associated with increase in age and increase in duration of diabetes mellitus. Keeping chronic diseases under control and avoiding bad habits will affect positively to improve the outcome of DM. Females were affected more than males.

**Keywords:** Acute coronary syndrome; Diabetic patients

**Abbreviations:** DM: Diabetes mellitus; ACS: Acute Coronary Syndrome; ACS: Among DPs Acute Coronary Syndrome in Diabetic Patients; MI: Myocardial Infarction; STEMI: ST Segment Elevation Myocardial Infarction; NSTEMI: Non ST Segment Elevation Myocardial infarction; USA: UN Stable Angina; IHD: Ischemic Heart Disease; AHA: American Heart Association; ESC: European Society of Cardiology; HF: Heart Failure; LBBB: Left Bundle Branch Block; ECG: Electrocardiogram; CXR: Chest X Ray; CBC: Complete Blood Count; NYHA: New York Heart Association; LVF: Left Ventricular Failure; ICU: Intensive Care Unit; BP: Blood Pressure; JVP: Jugular Venous Pulse; MR: Mitral Regurgitation; PCI: Percutaneous Coronary Intervention; CABG: Coronary Artery Bypass Graft; UFH: Unfractionated Heparin; LMWHs: Low Molecular Weight Heparin; GRACE: Global Registry of Acute Coronary Events; RBS: Random Blood Sugar; FBS: Fasting Blood Sugar; HBA1C: Glycosylated Hemoglobin; RFT: Renal Function Test; LVH: Left Ventricular Hypertrophy; AF: Atrial Fibrillation

## Background

Coronary artery diseases (CAD) are the leading causes of mortality and morbidity among diabetic patients [1]. As diabetic patients are more likely to experience acute myocardial infarction, they are also at greater risk of dying after acute cardiac event or even at least develop woes prognosis than non-diabetic patients. [2,3].

Several mechanisms play role in making acute coronary syndrome (especially MI) the leading cause of death in diabetics the most important mechanisms are: macroangiopathy with accelerated atherosclerosis and hypertension, microangiopathy with related endothelial dysfunction and disturbed plate late function, autonomic neuropathy, and Metabolic alternation with generation, accumulation of free radicals and alternation of ions homeostasis [4].

Therefore, among all patients with acute coronary syndrome (ACS) those with Diabetes Mellitus (DM) are at particularly high risk of recurrent cardiovascular events and premature death [2,3].

CAD is the leading cause of death in diabetic patients and it's also the most common cause of hospitalization and intensive care unit admission in diabetics. Therefore, this study will provide information to researchers and readers about prevalence and risk factors associated with ACS among Diabetic patients.

### Aim

To determine the prevalence of acute coronary syndrome and associated risk factors among diabetic patients

### Material and Methods

#### Study design

A cross-sectional, hospital-based study was conducted among ACS patients from 2020 to 2021.

#### Study setting

This study was carried out in internal medicine department in Al-Wahdah teaching hospital, Thamar government, Yemen.

#### Study population

All patients who had admitted with diagnosis of ACS with DM to in internal medicine department in Al-Wahdah teaching hospital. The inclusion criteria of the study were all patients who present with ACS on top of diabetes mellitus and the exclusion criteria those patients who present with DM or its complications without ACS.

#### Sampling methods

All patients admitted to the internal medicine department in Al-Wahdah teaching hospital, Thamar government from 2020-2021 were enrolled in the study.

#### Data collection and Tool

Data were collected as from document and records and a face-to-face interview with patients using questionnaire for assessing the prevalence of acute coronary syndrome and associated risk factors among diabetic patients which covered the following: The first section, was related to demographic characteristics. The information included: Age, gender, educational level, and marital status. The second section was the clinical data. Patients' clinical data was documented on files- focusing on symptoms) chest pain: At rest, on exertion, not present. Dyspnea: at rest, on exertion, not present. Other symptoms as: lower limb edema, palpitation, dizziness) [5].

### Cardiopulmonary examination

(Heart sounds: weak, normal, add sounds. Crepitation: no basal, all over). Patients' investigation was documented on the sheets including laboratory investigations (RBS, HBA1C, Cardiac enzymes, CBC, RFT, LFT, Serum electrolytes and lipid profiles) and radiological tests (ECG and CXR). The data that suggest risk factors such as family history, long duration of DM, smoking, hypertension, and Khat chewing and Shammah [6].

### Data analysis

Analysis was performed using statistical package for social science (SPSS). Demographic characteristics and clinical history of the patients were presented in terms of frequency and percentage. Chi-square was used to find out the association between factors and the ACS outcome [7].

### Ethical consideration

Approval was obtained before carrying out this study from Al-Wahdah teaching hospital to conduct this study. Oral consent was obtained upon agreeing to participate in the study.

### Result

#### Demographic characteristics

The demographic characteristics of the patients is presented in Table 1. It was found that about 47% of the patients were male. The age group > 60 years was representing 57%, all of them married 100% and 57% were uneducated (Tables 1-8) (Figures 1-3).

**Table 1:** Demographic characteristics among patients.

Demographic characteristics	F	%
<b>Age category</b>		
• <40 year	3	6
• 40-60 year	21	40
• >60 year	30	57
<b>Gender</b>		
• Male	25	47
• Female	28	53
<b>Marital status</b>		
• Married	53	100
• Unmarried	0	0
<b>Educational level</b>		
• Educated	16	30
• Uneducated	30	57
• Not mentioned	7	13

**Table 2:** Prevalence of ACS among diabetic patients.

Characteristics	F	%
DM with ACS	53	24.5
DM without ACS	163	75.5
Total	216	100

**Table 3:** Clinical data of responders.

Characteristics	Number	%
Chest Pain	34	64%
Dyspnea	40	75%
Edema	18	34%
Palpitation	12	23%
Epigastric pain	8	15%
Vomiting	8	15%
Dizziness	6	11%

**Table 4:**

Other Risk Factors	Number	%
DM	53	100%
HTN	35	66%
QAT CHAWING	25	47%
SMOKING	11	21%
SHAMA	4	7.50%

**Table 5:** physical examination of patient of ACS with DM on admission.

Characteristics	N	%
Body built	Avarage	20 28.80%
	Under weight	4 7.50%
	Overweight	2 3.70%
	No data found	27 60%
Heart rate	Normal	33 62%
	Tachycardia	15 28%
	Bradycardia	5 9%
Blood pressure	Normal	27 51%
	Hypertension	20 38%
	Hypotension	6 11%
Heart sounds	Weak	8 15%
	Normal	35 66%
	Add sounds [S3]	9 17%
Crepitation	Present	37 70%
	Absent	16 30%

**Table 6:** Laboratory Investigations.

Characteristics	N	%
RBS	Normal	3 6%
	Abnormal	48 91%
	No data found	2 4%
CBC	Normal	28 53%
	Abnormal	20 38%
	No data found	5 9%

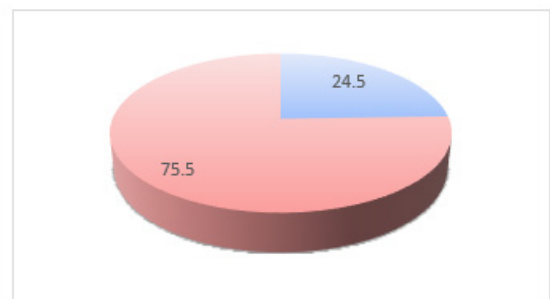
Car. Enzymes	Normal	6 11%
	Abnormal	19 36%
	No data found	28 53%
RFT	Normal	22 42%
	Abnormal	25 47%
	No data found	6 11%
HBA1C	Normal	6 11%
	Abnormal	8 15%
	No data found	40 75%
Serum Electrolytes	Normal	12 23%
	Abnormal	6 11%
	No data found	35 66%

**Table 7:** ECG abnormalities.

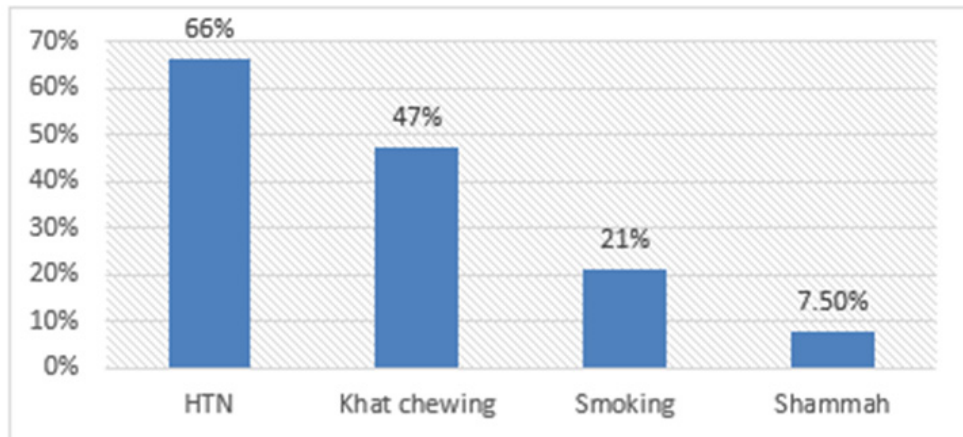
Characteristics	N	%
STEMI	18	34%
NSTEMI	10	19%
RBBB	11	21%
LBBB	14	26%
T wave inversion	14	26%
AF	3	6%
LVH	6	11%

**Table 8:** Pharmacological and non-pharmacological treatments.

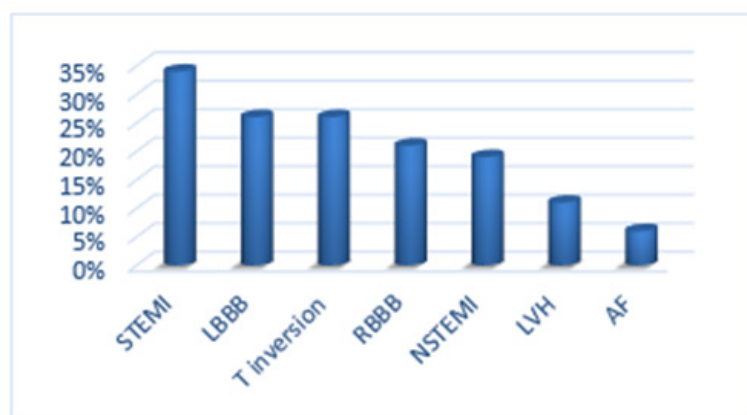
Characteristics	Frequency	%
Aspirin	53	100%
ACE inhibitors	48	91%
Beta blockers	46	87%
Calcium channel blockers	10	19%
LMWH	25	47%
Nitrate	21	40%
Statins	48	91%
UFH	25	47%
Iib/IIia inhibitors TIROFIBAN PROCEDURE IF DONE	4	8%
PCI	4	8%
CABG	0	0%



**Figure 1:** Prevalence of ACS among diabetic patients.



**Figure 2:** Risk factors of ACS among diabetic patients.



**Figure 3:** ECG abnormalities.

## Discussion

The current study done on 216 hospitalized patients who admitted as case of diabetes mellitus in Al-Wahda teaching hospital in Thamar governorate, Yemen. In our population study, the overall prevalence of ACS among diabetic patients is 24.5% (53). These results agree with some previous studies. In our study, we observed that female patients 28 (53%) were slightly more than male patients 25(47%). 3 (6%) of all patients with ACS are less than the age of 40, whereas 21 (40%) between 40-60, and 30 (57%) are more than the age of 60 years, which indicates that risk of ACS increased significantly above 40 years old, although most patients are above the age of 60.

In the current study, the characteristic chief complaint of patients on presentation. Were dyspnea 40 (75%), chest pain 34(64%), edema 18 (34%), palpitation 12 (23%), epigastric pain and vomiting 8 (15%) which indicates high incidence of atypical manifestations (dyspnea, and edema) of ACS and therefore high incidence of silent ACS in diabetic patients. Analysis of risk factors reveals most patients were hypertensive 35(66%). These results are consistent with previous studies, also many patients had other risk factors as Khat chewing 25(47%), smoking 11(21%), and Shammah 4 (7.5%) which farther aggravates the risk [8-13].

The result of the current study also shows that the prevalence of STEMI 18 (34%), NSTEMI 10 (19%), and unstable angina 14 (26%). These results are consistent with previous studies, other patients present with AF, LVH, and non-specific ST segment and T wave changes. People need access to learn about their major risk factors to avoid, and the importance of diabetes control as DM plays the most important role. Additionally, the study results could have been affected by unmeasured confounding variable socioeconomic state and post hospital care.

## Conclusion

The prevalence of ACS among diabetic patients is estimated to be 24.5%. Most patients with ACS were hypertensive 66% and increased rate if silent ACS. ACS in Yemeni individuals with DM was associated with increase in age and increase in duration of DM. Females were affected more than males.

## Recommendations

Keeping chronic diseases under control and avoiding bad habits will affect positively to improve the outcome of DM. Provide access for patients to learn about their disease and possible complications, to work with their doctors achieve better glycemic control. Aggressive treatment of hypertension and hyperlipidemia

solely on the basis of diabetes status. and correction of modifiable risk factors. Such as smoking, obesity, Shammah and Khat chowing.

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