

# Prevalence of Acute Coronary Syndrome among Patients Presenting with Chest Pain

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## ABSTRACT

**Background and Aim:** Multiple organ diseases can cause chest pain. One of the most important differential diagnoses is acute coronary syndrome (ACS). The present study aim was to determine the incidence of ACS among patients presented with chest pain.

**Patients and Methods:** This observational study was carried out on 168 patients presented with chest pain in the Department of Cardiology, DHQ Teaching Hospital / GKMC, Swabi and Punjab Institute of Cardiology Lahore. The duration of study was 6 months from October 2021 to March 2022. Chest pain, diabetes, hypertension, and smoking status from each individual were recorded. The incidence of ACS was determined. Patients presented with chest pain and had >16 years age were enrolled. Thoracic patients, traumatic chest pain, and local infectious patients were excluded. Nature of chest pain such as substernal pain, nitroglycerin relieved pain, and exertion provoked pain were assessed. ACS was diagnosed and confirmed by electrocardiograph (ECG), prior history, and cardiac biomarkers. Descriptive statistics was carried out in SPSS version 26.

**Results:** Of the total patients, there were 116 (69%) male and 52 (31%) females. The prevalence of acute coronary syndrome was 62 (36.9%) among patients presented with chest pain. The overall mean age was  $46.82 \pm 12.1$  years with age range from 16 years to 80 years. The incidence of diabetes, hypertension, and smoker were 48 (28.6%), 66 (39.3%), and 38 (22.6%) respectively. Out of 168 patients, the prevalence of non-specific, atypical, and typical chest pain was 88 (52.3%), 50 (29.8%), and 30 (17.9%) respectively. Of the total 62 ACS patients, the incidence of STEMI, NSTEMI, and unstable angina were 28 (45.2%), 19 (30.6%), and 15 (24.2%) respectively.

**Conclusion:** The present study found that the incidence of ACS was 36.9% among patients presented with chest pain. Acute coronary syndrome was the most important differential diagnoses in chest pain patients. If a patient is presenting with chest pain, the diagnosis of ACS needs to be strongly deduced, and prompt action taken so that the patient can undergo proper treatment as soon as possible.

**Keywords:** Acute coronary syndrome, Chest pain, Prevalence

## INTRODUCTION

Multiple organ disease can cause chest pain. Acute coronary syndrome (ACS) is one of the major distinctive diagnosis for chest pain [1, 2]. Acute coronary syndromes (ACS) are currently managed with optimal medical treatment and early invasive management. Many hospitalized patients with chest pain were advised to have an acute coronary syndrome, despite the fact that normal cardiac markers and no ischemic evidence do not meet the management criteria. Chest pain etiology in acute coronary syndrome patients could be described with their subtypes such as 'non-specific chest pain' (NSCP), atypical pain, and typical pain [3,5]. Acute coronary syndrome (ACS) is a set of clinical symptoms caused by coronary artery occlusion, which is most commonly caused by thrombus formation on a ruptured atherosclerotic plaque [6]. Cardiovascular disease risk factors such as gender, hypertension, age, family history, and diabetes were associated with acute coronary syndrome [7, 8].

Fibrinolysis (thrombolytic therapy) and (PCI) percutaneous coronary intervention are two recently accessible interventions for restoring coronary perfusion relying on acute coronary syndrome [9]. Based on suggestion made by European Society of Cardiology, mostly patients were considered as low risk for acute coronary syndrome where physical examination, cardiac biomarkers, patients history, and electrocardiogram (ECG) are not diagnosed shows the most common patients hospitalized for chest pain [10, 11]. Acute coronary syndrome with chest pain is the leading cause of morbidity and mortality, in turn results in premature death. World health organization reported that ischemic heart disease causes 8.1 million deaths [12]. The ACS main symptoms are unstable angina and myocardial infarction [13]. Depression, panic attack, and anxiety like psychiatric disorders are significantly related to non-cardiac chest pain with prevalence varying from 23% to 57% [14, 15]. The present study aimed to

determine the incidence of ACS in patients presented with chest pain.

## METHODOLOGY

This observational study was carried out on 168 patients presented with chest pain in the Department of Cardiology, DHQ Teaching Hospital / GKMC, Swabi and Punjab Institute of Cardiology Lahore. The duration of study was 6 months from October 2021 to March 2022. Chest pain, diabetes, hypertension, and smoking status from each individual were recorded. The incidence of acute coronary syndrome was determined. Patients presented with chest pain and had >16 years age were enrolled. Thoracic patients, traumatic chest pain, and local infectious patients were excluded. Nature of chest pain such as substernal pain, nitroglycerin relieved pain, and exertion provoked pain were assessed. ACS was diagnosed and confirmed by electrocardiograph (ECG), prior history, and cardiac biomarkers. After taking patient's detail history, acute coronary syndrome were confirmed and diagnosed. Patients were further subcategorized into STEMI, unstable angina, and NSTEMI. On ECG, patients with  $\geq 1$  mm ST elevation were STEMI. Typical chest pain is caused by exertion and relieved by nitroglycerine in the presence of three characteristics, atypical cases where two characteristics were present and non-specific cases were less than two characteristics. SPSS version 26 was used for data analysis. Quantitative variables were expressed as mean and standard deviation where qualitative variables were described as frequency and percentages. ACS diagnosis variables were correlated using multiple regression model. All the descriptive statistics were carried out using 95% confidence interval and 5% level of significance.

## RESULTS

Of the total patients, there were 116 (69%) male and 52 (31%) females. The prevalence of acute coronary syndrome was 62 (36.9%) among patients presented with chest pain.

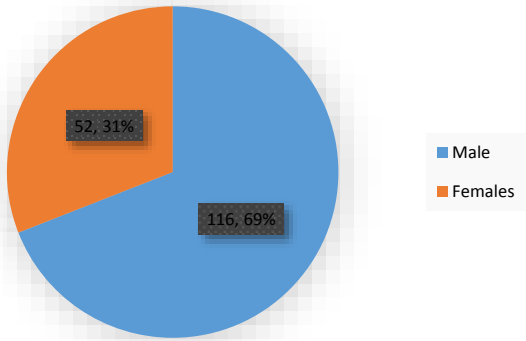


Figure-1: Gender's distribution

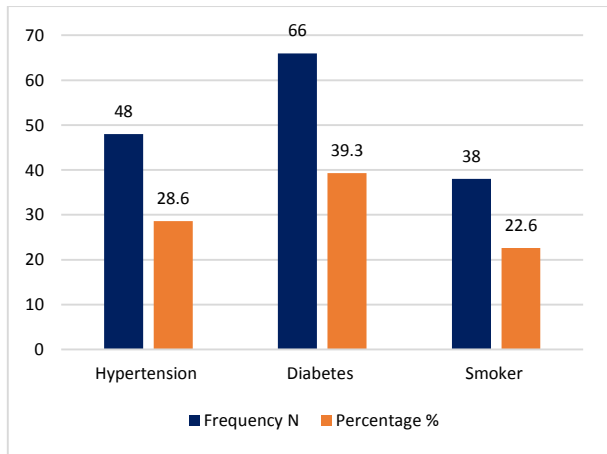


Figure-2: the incidence of diabetes, hypertension, and smoking

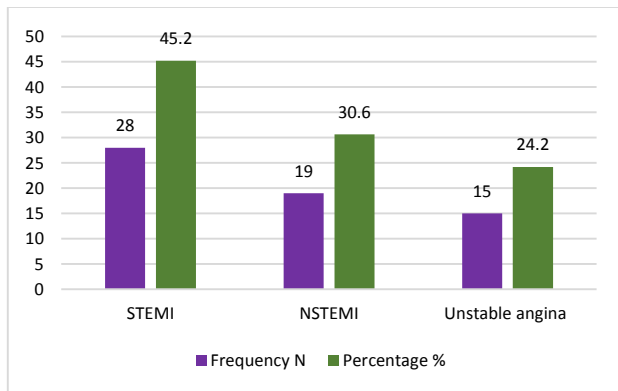


Figure-3: prevalence of STEMI, NSTEMI, and unstable angina

The overall mean age was 46.82±12.1 years with age range from 16 years to 80 years. The incidence of diabetes, hypertension, and smoker were 48 (28.6%), 66 (39.3%), and 38 (22.6%) respectively. Out of 168 patients, the prevalence of non-specific, atypical, and typical chest pain was 88 (52.3%), 50 (29.8%), and 30 (17.9%) respectively. Of the total 62 ACS patients, the incidence of STEMI, NSTEMI, and unstable angina were 28 (45.2%), 19 (30.6%), and 15 (24.2%) respectively. Gender's distribution is shown in Figure-1. The incidence of diabetes, hypertension, and smoking is shown in Figure-2. The prevalence of STEMI, NSTEMI, and unstable angina is illustrated in Figure-3. Table-I represents the incidence of non-specific, typical, and atypical chest pain. A significant association has been found between ACS diagnosis and different parameters such as gender,

hypertension, age, and smoking using multiple linear regression as shown in Table-II.

Table-1: Incidence of atypical, typical, and non-specific chest pain

Types of Chest Pain	Frequency N	Percentage %
Non-specific chest pain	88	52.3
Atypical chest pain	50	29.8
Typical chest pain	30	17.9

Table-2: association has been found between ACS diagnosis and different parameters such as gender, hypertension, age, and smoking using multiple linear regression.

Parameters	Coefficient B (Unstandardized)	Coefficient B (Standardized)	P-value
Age	0.005	0.214	0.013
Gender	-0.168	-0.168	0.042
Pain types	-0.168	-0.283	0.001
Hypertension	0.213	0.217	0.012
Diabetes	0.069	0.064	0.293
Smoking	0.229	0.213	0.012

## DISCUSSION

The present study investigated the occurrence of ACS among patients presented with chest pain and found that acute coronary syndrome was present in 36.9% of patients presented with chest pain. Acute coronary syndrome was the most common differential diagnosis in patients with chest pain. A previous study reported that incidence of ACS was 51.5% among patients of chest pain [16]. We discovered that one out of every three patients diagnosed with MI on the index admission did not have chest pain on presentation, and, contrary to popular belief, patients with diabetes pretended less than one-third of this group. In our study, the overall mean age was 46.82±12.1 years and 69% patients were males. Medagama et al [17] found higher mean age 61±18 years and lower incidence of male patients 57%. According to Sharma et al [18], the majority of chest pain patients were between the ages of 36 and 45, with 63% being male.

The present study found that the incidence of hypertension, diabetes, and smoker was 28.6%, 39.3%, and 22.6% respectively. Beig et al [19] found that hypertension, diabetes, and smoker was found in 61.7%, 29.8%, and 34.04% respectively. Another study conducted by Hajar et al [20] found that incidence of diabetes and hypertension was 15% and 63% respectively. According to Khattri et al [21] study, the incidence of hypertension and diabetes was 23.5% and 7.4% respectively in non-traumatic chest pain patients.

In the present study, the occurrence of ACS was 36.9% among patients presented with chest pain. A previous study reported that ACS was found in 33.93% cases [22]. The incidence of ACS in the present study was comparable to other published studies [23, 24]. The ACS diagnosis is significantly associated with gender, hypertension, age, and smoking. The difference in occurrence of ACS among chest pain patients might be due to variations in geographical, ethnic, and overall health care system.

The prevalence of non-specific, typical, and atypical chest pain in the present study is 52.3%, 17.8%, and 29.8% respectively. According to Belguith et al [25] the non-traumatic chest pain was found in 48% patients. Majority of studies revealed that acute coronary syndrome and acute chest pain are significantly associated with each other [26, 27].

## CONCLUSION

The present study found that the incidence of ACS was 36.9% among patients presented with chest pain. Acute coronary syndrome was the most important differential diagnosis in chest pain patients. If a patient is presenting with chest pain, the diagnosis of ACS needs to be strongly deduced, and prompt action taken so that the patient can undergo proper treatment as soon as possible.

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