



ORIGINAL ARTICLE

Frequency of Non-ST segment elevation myocardial infarction (NSTEMI) in acute coronary syndrome among patients presenting with the chest pain in emergency department of tertiary care hospital.

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ABSTRACT... Objective: To determine the frequency of NSTEMI (non-st elevation myocardial infarction) in acute coronary syndrome patients presenting with the chest pain in emergency department of tertiary care hospital. **Study Design:** Cross Sectional study. **Setting:** Jinnah Post graduate Medical College Hospital Karachi. **Period:** June 20, 2023. **Methods:** Enrolling 112 consecutive volunteers was carried out Interview questions focused on the participants' smoking, blood pressure, diabetes, and type of chest pain. Whether or not the participants had ACS, their diagnosis was documented. NSTEMI frequency was computed. **Results:** We have 112 patients enrolled with mean age was 52.73 ± 14.24 years. Sixty five (58%) were male while forty seven (41.9 %) were females. out of 112 patients 45 (40.1%) were hypertensive, 32(28.5%) were diabetes and 29 (25.8%) were smoker. Among the participants 21 (18.7%) had NSTEMI and showed positive correlation with age, gender, nature of chest pain, hypertension and smoking. **Conclusion:** Among the individuals, one of the most frequent causes of chest pain was acute coronary syndrome. High suspicion and additional testing are they key tools for early diagnosis and management.

Key words: Acute Coronary Syndrome (ACS), Emergency Department (ED), Non-st Elevation MI (NSTEMI).

INTRODUCTION

One of the serious conditions seen in the emergency department (ED) is acute coronary syndrome (ACS). Emergency doctors (EPs) should evaluate the primary complaint and consider ACS in the differential diagnosis when patients present to the ED with chest discomfort. The ED uses a variety of diagnostic techniques, such as an electrocardiogram (ECG) and biomarker quantification, to increase the precision of ACS diagnosis.^{1,2} Imaging-wise, coronary computed tomography and echocardiography may be able to identify ACS. The diagnosis of NSTEMI ACS, however, may be challenging specially when the ECG is normal so needs to focus on history of unusual symptoms and ambiguous finding.^{3,4}

Chest pain that was ischemic was discovered in varying degrees in earlier research conducted in

diverse contexts. There was a strong correlation observed between NSTEMI and conventional risk factors and predicts diagnosis likely. Chest discomfort that is substernal and is brought on by exercise and eased by rest or nitroglycerin is classified as typical if it possesses all three features, it referred as atypical if two characteristics are present and nonspecific when less than two are present. Research indicates that anginal chest discomfort is associated with a significant risk of CAD among these groups.⁵ Research has indicated that a small percentage of people with NSTEMI may present with unusual chest pain. Many patients are released from the emergency department (ED) due to unfavorable investigation findings, even if the ECG and cardiac biomarkers are monitored and rechecked. Nevertheless, NSTEMI is verified in some of the patients' later evaluations when they

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return to the ED with the same primary complaint or additional symptoms.^{6,7} Furthermore, it may be more challenging to confirm an ACS diagnosis in senior individuals who go to the ED with chest discomfort or other comparable symptoms. In our setup, our goal was to determine the frequency of ACS in patients who presented with chest pain and to make local protocols for earlier diagnosis and proper management.

METHODS

From June 20, 2022, this observational study was carried out at JPMC Karachi Pakistan. The Institutional Review Board (IRB) granted ethical approval (F-81/2023-GEN/39/7/JPMC). By using WHO calculator with confidence level of 95% with error of margin 5% and anticipated Population around 7.9% sample size is 112. Patients who complained of chest pain and were at least eighteen years old were enrolled by using non probability consecutive technique meeting the inclusion criteria and those patients presented with traumatic chest discomfort, recent thoracic surgeries, and visible/documented local infections were excluded. The patients' chest pain was thoroughly assessed, with particular attention paid to whether it was substernal, brought on by effort, eased by rest, or affected by nitroglycerin. The discomfort was described as usual, if it possessed all three traits, nonspecific if it possessed fewer than two traits, or atypical if it possessed two traits. We learned about the participants' histories of smoking, hypertension, and diabetes. The individuals' final diagnosis was verified to determine whether or not it was NSTEMI.

The history, electrocardiogram (ECG), and cardiac enzymes were used to confirm the diagnosis of ACS. NSTEMI was the diagnosis made for patients with a positive cardiac biomarker but no ST elevation. By using SPSS version 22 the collected data was analyzed. The frequency and percentage were computed for ACS and other variables. The mean was computed for age, gender and risk factors. Chi-square test was applied and the p-value ≤ 0.05 was taken as statistically significant.

RESULTS

The participant's ages ranged from 22 to 92 years old, mean age was 52.73 ± 14.24 years, mean height of 1.61 ± 2.3 meters and with BMI of 28.3 ± 5.2 was shown in Table-I. Sixty five (58.03%) were male while forty seven (41.9 %) were females. Out of 112 patients 45 (40.1%) were hypertensive, 32(28.5%) were diabetes and 29 (25.8%) were smoker. Among the participants 21 (18.7%) had NSTEMI as shown in Table-II.

Variable	Range	Mean
Age (years)	22-92	52.73 ± 14.24
Weight (kg)	60-90	67.3 ± 21.1
Height (meter)	1.38-1.68	1.61 ± 2.3
BMI (kg/m2)	25-31	28.3 ± 5.2

Table-I. Demographic statistics

Variable	Frequency	Percentage
Gender		
Male	65	(58.03%)
Female	47	(41.9 %)
Diabetes	32	(28.5%)
Hypertension	45	(40.1%)
Smoker	29	(25.8%)
NSTEMI	21	(18.7%)

Table-II. Statistics of clinical characteristics

DISCUSSION

The primary presenting symptom that requires medical professionals' immediate attention and treatment is chest discomfort. Even in the general population that appears to be in good health, angina is a significant predictor of outcomes and greatly influences health-related quality of life. Present issues include symptoms specific to this age group, unusual and delayed presentation, and noncompliance with therapy. When presenting in ED, many patients with NSTEMI-ACS may have normal ECG readings, indicating that ECG is frequently non-diagnostic in cases of ACS. The rate of morbidity and death from cardiac problems is low in patients who arrive at the emergency room complaining of chest discomfort and having a normal electrocardiogram.^{8,9}

This study includes the participants with mean age of 52.73 ± 14.24 years, with majority of being men

and it is in agreement with a study conducted by Bjornson and associates, 57% of participants who presented with chest discomfort in a Norwegian hospital had a mean age of 61 ± 18 years with larger male population.¹⁰ Similar findings were observed in an Indian study by Sharma and colleagues where majority of patients presenting with chest discomfort were between the ages of 36 and 75, and 63% of them were male.¹¹

We observed NSTEMI in 21 (18.7%) individuals who had chest discomfort. Baccouche and colleagues noted NSTEMI in 22.3%, while it was not consistent with findings of Martinez-Selles and colleagues who reported bit lower number of 15.7% of patients with NSTEMI among patients presenting with chest discomfort this may be because of sample size and population.^{12,13} In a study by Rozi and Junaid noted NSTEMI in 49 patients (22.8%), this higher number may be because study was conducted at specific cardiac hospital.¹⁴ Turnipseed et al. showed that the frequency of NSTEMI was 17%, while similar results of 17% were also observed by Singer et al., by using creatine phosphokinase myocardial band (CPK-MB) as a marker of cardiac injury.^{15,16}

Comparable to existing research, our patient population with chest discomfort had an intermediate prevalence of ACS. The variation in the prevalence NSTEMI in patients presenting with various conditions could be attributed to a number of factors, including variations in the prevalence of risk factors, ethnic, racial, and geographic variation. We discovered that NSTEMI have strong correlation with risk factors like hypertension, and smoking helping in accurate diagnosis and prompt management. Numerous previous research has demonstrated the relationship between cardiovascular disease and the aforementioned risk factors in varying degrees, and the majority of the results from this study are consistent with previous literature.¹⁷

We have 40.1% hypertensive, 28.5% were having diabetes while 25.8% were smoker in the current study. Similar number were also seen in Gandhi and colleagues who reported that among the patients in India who presented with chest pain,

61.7% had hypertension, 29.79% had diabetes, and 34.04% smoked.¹⁸ Prattipati and colleagues found hypertension up to 62.9% among Tanzanian patients presenting with dyspnea or chest discomfort and diabetes were present in 15% of cases.¹⁹ However, at an urban emergency room in Tanzania, Mohamed and colleagues discovered that 7.4% of participants had diabetes and 23.5% of participants had hypertension when they presented with non-traumatic chest discomfort.²⁰

There are some restrictions on this study. It was a single-center investigation with a constrained sample size and time frame. Only a few typical risk variables were mentioned. A lengthier research with a bigger sample size would have provided a more complete picture over that time. As a result, we support larger research with lots of people and both established and novel potential risk factors.

CONCLUSION

One of the most frequent causes of chest discomfort among patients visiting the emergency room of a tertiary cardiac center was acute coronary syndrome. When a patient with these risk factors experiences chest discomfort, they should be strongly suspected of having NSTEMI and should be evaluated right away so they can receive timely treatment.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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