

An Analysis of STEMI Cases in the Postgraduate Hospital in Khost, Afghanistan

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ABSTRACT

Myocardial infarction, specifically ST elevation myocardial infarction (STEMI), involves the development of localized ischemic necrosis in the heart muscle due to an acute disruption of coronary blood flow. It clinically presents as burning, pressing, or squeezing chest pain that radiates to the left arm, collarbone, scapula, or jaw, along with symptoms such as shortness of breath, a feeling of fear, and cold sweat. Immediate hospitalization in a cardiac intensive care unit is crucial for patients with a developed myocardial infarction, as delays in treatment can be fatal.

This study is a descriptive case series conducted in the year 1397 of the Islamic calendar. Out of 1602 inpatients admitted to Khost Postgraduate Hospital during this period, 50 patients were diagnosed with STEMI.

The primary objectives of this research were to determine the frequency and pattern of STEMI cases at Khost Postgraduate Hospital during the year 1396 of the Islamic calendar.

Keywords- myocardial infarction, risk factor, complication, treatment, prevention.

I. INTRODUCTION

Myocardial infarction, particularly ST-elevation myocardial infarction (STEMI), is characterized by the necrosis of heart muscle tissue due to an acute interruption in coronary blood flow. Clinically, it presents with intense, constricting chest pain that can radiate to the left arm, shoulder, jaw, and back, along with symptoms such as shortness of breath, anxiety, and cold sweat. Immediate hospitalization in a cardiac intensive care unit is critical, as delays in treatment can be fatal.

Men aged 40-60 are 3-5 times more likely to experience myocardial infarction than women, primarily due to the earlier onset of atherosclerosis in men. By age 55-60, the prevalence of myocardial infarction becomes similar in both sexes. The mortality rate associated with

myocardial infarction is between 30-35%, and it accounts for 15-20% of sudden deaths.

A sustained disruption in blood flow to the myocardium for 15-20 minutes or longer results in irreversible damage to the heart muscle and impairs cardiac function.

II. METHODOLOGY

Our study is a descriptive analysis based on a case series conducted from January 1, 1396, to December 29, 1396, according to the Hijri Shamsi calendar. During this timeframe, 1,602 patients were admitted to Khost Postgraduate Hospital, out of which 50 were diagnosed with STEMI.

Objectives:

To determine the frequency and pattern of STEMI cases at Khost Postgraduate Hospital during the year 1396 of the Hijri Shamsi calendar.

Importance of This Research in Health System:

The rise in cases of ST-elevation myocardial infarction (STEMI) is a significant cause of mortality and heart attacks in our society. This issue, however, is preventable. Our research aims to identify the precise causes and origins of STEMI. The findings of this study have the potential to capture the interest of relevant authorities, prompting them to implement proactive measures for the prevention and management of STEMI.

Table 1: Percentage off STEMI among all inpatient.

All inpatients	1602	100 %
Non cardiac patients	1552	96.87 %
STEMI patient	50	3.12 %

In above table, 50 (3.12 %) patients, are STEMI of the total 1602 inpatients, this table shows that 3.12 % patient are STEMI patients.

Table 2: Percentages of STEMI patients among male and female.

All inpatients	50	100 %
Male STEMI patients	30	60 %
Female STEMI patient	20	40 %

This above table shows that among all 50 patients 15 (30%) are male and 35 (70 %) patients are female. It means that STEMI is more in male.

Table 3: Percentage of patients according to residency.

All inpatients	50	100 %
Central area of Khost	28	56 %
Urban area of Khost	15	30 %
Neighbor Provinces	7	14 %

In above table shows that 50 STEMI patients who came to Khost post graduated hospital, among them 28 (46 %) patients were from Central area of Khost. 15 (30 %) patients came from Urban area of Khost and 7 (14 %) patients came from neighboring provinces.

Table. 4: Percentage of patients according to risk factor.

All inpatients	50	100 %
Old age	12	24 %
HTN	18	18 %
DM	12	24 %
Dyslipidemia	8	16 %

The above table shows that 50 STEMI patients who came to Khost post graduated hospital, among them

the risk factors were as below. 12 (24 %) patients risk factor was old age, 18 (36 %) patients risk factor was HTN, 12 (24 %) patients risk factor was DM and 8 (16 %) patients risk factor was dyslipidemia.

Table 5: Percentage of patients according to sign and symptoms.

All inpatients	50	100 %
Chest pain	42	84 %
weakness	3	6 %
Nausea	1	2 %
breathlessness	3	6 %
Diaphoresis	1	2 %

The above table shows that 50 STEMI patients who came to Khost post graduated hospital. Among them 31 (62 %) patients had chest pain, 3 (6%) had weakness, 1 (2 %) had nausea, 3 (6%) has breathlessness, 11 (22 %) had chest discomfort and 1 (2 %) had diaphoresis.

Table 6: Percentage of patients according to complication.

All inpatients	50	100 %
no complications	35	70 %
Shock	5	10 %
Arrhythmias	4	8 %
HF	3	6 %
Mitral regurgitation	2	4 %
Pericarditis	1	2 %

The above table shows that 50 STEMI patients who came to Khost post graduated hospital. among them 35 (70 %) patients were no complicated. Among the complicated patients 5 (10 %) had shock 3 (6%) had HF, 2 (4 %) had Mitral regurgitation, 1 (2%) has pericarditis.

III. INTERNATIONAL LITERATURES REVIEW

Pakistan Rawalpindi:

This study was conducted at the Armed Forces Institute of Cardiology & National Institute of Heart Diseases (AFIC-NIHD) in Rawalpindi, Pakistan, over the period from April to September 2005. The sample consisted predominantly of male patients, totaling 234 (78%) individuals, with an average age of 58 ± 11 years. Cigarette smoking was a significant risk factor, affecting 138 (46%) patients, while obesity (BMI >25) was the least common risk factor, seen in only 12 (4%) patients. The majority of the patients, 282 (94%), experienced typical chest pain, and 216 (72%) presented within the first six hours of symptom onset. Upon initial examination, 240 (80%) of the patients showed no abnormalities, whereas 60 (20%) exhibited signs of left ventricular failure. Isolated inferior myocardial infarction was recorded in 138 (46%) patients, and anterior myocardial infarction in 48 (16%) patients. Additionally, 282 (94%) patients

exhibited normal electrocardiographic rhythms at the time of presentation.

Pakistan Peshawar:

This study was carried out at Hayatabad Medical Complex in Peshawar and was descriptive in nature. It spanned five months, from February to June 2015. The study included 83 patients diagnosed with ST-Elevation Myocardial Infarction (STEMI). Of these, 50.6% were male and 49.4% were female, with ages ranging from 30 to 83 years.

Among the patients, 59 (71.08%) received thrombolytic therapy within 12 hours of the onset of chest pain, while 24 (28.92%) were treated after this period. Of those treated within the first 12 hours, 43 (72.88%) showed complete resolution of symptoms on ECG. Conversely, none of the patients treated after 12 hours achieved complete resolution. The chi-square test yielded a value of 36.470 with a p-value of less than 0.001, indicating a significant difference.

The study also examined the impact of diabetes on treatment outcomes. Out of 28 diabetic patients, six (21.43%) had complete resolution, nine (32.14%) had partial resolution, and 13 (46.43%) did not resolve. In contrast, among the 55 non-diabetic patients, 37 (67.27%) achieved complete resolution, 12 (21.82%) had partial resolution, and six (10.91%) did not resolve.

For patients with hypertension, 26 out of 61 (42.62%) achieved complete resolution, while 17 out of 22 (77.27%) non-hypertensive patients achieved complete resolution. The presence of hyperlipidemia and the location of the infarction did not show a statistically significant effect on the resolution of ECG abnormalities following thrombolysis.

Iran Tehran:

In this cross-sectional analysis involving 801 individuals aged 35 and older, participants were selected through cluster sampling in Borujerd. The cohort was composed of 412 men and 389 women, with an average age of 54.82 years (± 12.11 years). The study revealed that the prevalence rates for various risk factors were 38.2% for hypertension, 17.4% for diabetes mellitus, 64% for dyslipidemia, 23.2% for smoking, and 22.8% for obesity. According to the established criteria, 19.1% of the coronary artery disease (CAD) cases were classified as definite, while 31.7% were considered probable. Additionally, 12.5% exhibited definite CAD signs and symptoms, and 5.4% had positive results on the Rose Angina Questionnaire.

IV. RESULT

Our study involved 50 patients, and the findings indicate that the age group most affected by the condition was between 60 and 69 years, accounting for 32% (16 patients) of the total. Among the patients, 60% (30 patients) were male, while 40% (20 patients) were female. The study also identified high blood pressure in 18% (9 males) and diabetes mellitus in 12% (6 females). A

significant number of patients, 84% (42 patients), reported experiencing chest discomfort. Additionally, 64% (32 patients) experienced central chest pain lasting for at least 30 minutes, and 24% (12 patients) had an abnormal pulse. Most patients, 70% (35 patients), did not experience complications. The study also revealed a higher incidence of STEMI in the elderly, with 24% of the cases occurring in this age group.

V. DISCUSSION

Based on our research, it is evident that STEMI (ST-Elevation Myocardial Infarction) occurred more frequently in males compared to females. The study indicates that high blood pressure was the predominant cause of STEMI in males, whereas diabetes mellitus was more common among females. Additionally, the majority of patients experienced chest discomfort, with central chest pain lasting for a minimum of 30 minutes. Abnormal pulse readings were observed in one-third of the cases. Furthermore, the study revealed that most patients did not experience complications, and the occurrence of STEMI was notably higher among elderly patients.

VI. CONCLUSION

Our study involved 50 patients and found that the majority of cases occurred in individuals aged between 60 and 69 years. This demographic was compared with data from Rawalpindi, where the age range of affected individuals was between 11 and 58 years, Peshawar, with an age range of 30 to 83 years, and Tehran, where it was 12 to 54 years. These comparisons suggest that the incidence of the disease is more prevalent among older adults. Additionally, our findings showed that ST-Elevation Myocardial Infarction (STEMI) was more common in males, constituting 60% of the cases, which is higher compared to Peshawar (50.6%) and Tehran (51.43%). Chest pain was consistently identified as the primary symptom of STEMI across all studies, including ours. Our research also identified high blood pressure as a primary cause in the first degree and diabetes mellitus as a significant contributing factor in the second degree of STEMI. In contrast, cigarette smoking was the leading cause in Rawalpindi.

Research Limitations:

1. Patient files were incomplete and not fully compiled.
2. Essential tests for diagnosing cardiac diseases, such as cardiac biomarkers, were lacking, and patients faced economic difficulties.
3. There was a shortage of research funding in this field.
4. Patients from suburban areas frequently missed scheduled hospital visits.

Recommendations:

1. The study found that the majority of STEMI cases occurred in individuals aged 50 to 69, a group that often experiences significant disability. It is advised

that the Ministry of Public Health, along with other relevant institutions, undertake a detailed investigation into the rising incidence of STEMI in this age group. Efforts should be made to identify preventive measures or, if prevention is not feasible, to ensure timely treatment to avoid severe complications.

2. The study highlighted that STEMI symptoms are often nonspecific and resemble those of other conditions, which can lead to missed diagnoses. It is recommended that healthcare professionals exercise heightened vigilance in diagnosing STEMI to ensure early and effective treatment, thereby preventing potential complications.
3. It was noted that medical files were frequently incomplete, and laboratory test results were often missing. Hospital administrators are encouraged to ensure that patient medical records are meticulously completed and accurately maintained.
4. Given that this research was limited to Khost Provincial Hospital over a short period, it is recommended that the Ministry of Public Health initiate a more extensive study to gain a broader understanding of the issue and validate the findings.

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