Asia Pacific Journal of Advanced Education and Technology
Volume 2, Issue 3, September 2023 / P- ISSN 2815 – 245X / E – ISSN 2815 – 2468 / www.apjaet.com

Myocardial Infarction Prevalence and Management at Medical Teaching Institute, Hayatabad Medical Complex, Peshawar, KPK, Pakistan

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DOI: https://doi.org/10.54476/apjaet/61383

Abstract

Myocardial infarction focuses on the sudden deprivation of circulating blood including variation in myocardial tissue necrosis. Where it is an irretrievable death of ischemia. Annually, compared with other diseases, cardiac disease is the top contributor to human fatalities. The prevalence studies show that the rate has been increased in many countries. To discuss the myocardial infarction prevalence and management in 31 MI-diagnosed patients of Cardiology Ward, MTI, Hayatabad Medical Complex, Peshawar, KPK, Pakistan. A descriptive study was carried out based on clinical clerkship of 31 myocardial infarction diseased patients. The whole data was collected during a six days per week visit routine with the help of proforma containing i.e. questions about the patient's history. The data was analyzed properly by utilizing SPSS software version 21 and Microsoft Excel to draw results regarding the prevalence and management of myocardial infarction. Discussing the prevalence of myocardial infarction, in 31 MI-diagnosed patients 64.4% were male while in city-wise contribution Peshawar was ranked 1st among other KPK cities with a value of 45.02%. The mean average value was 62 years for all patients. In the management of MI, hypertension was the leading risk factor having a percentage of 48% among others. Chest pain was found in almost all MI-diseased patients. 129.45 mmHg, and 81 mmHg were the systolic and diastolic blood pressure mean values respectively. It was found that the MI rate is higher in males compared to females. AWMI was the most commonly diagnosed type of MI. The suggested drug prescriptions at the said hospital were mostly clopidogrel, aspirin, rosuvastatin, and Enoxaparin.

Keywords: Ischemia, tissue necrosis, acute anterior wall myocardial infarction, chest pain, hypertension

Introduction

The heart is a muscle, located on the left of a human chest. Heart muscle is important due to what it does. It supplies blood to all human organs, where the blood provides necessary oxygen and nutrients. Meanwhile, it takes away waste too. (Dowshen, S., 2022). The heart is the 1st organ made during the development of the fetus in the placenta. (Herrick, E.J., Bordoni.B., 2022)., Worldwide, cardiovascular diseases (CVDs) are the prominent reason for demise. World Health Organization (WHO) report says, approximately 7.4 million people died of heart disease in 2015. 82% of people who die in low- and middle-income countries turn to CVD. It is expected that due to CVD around 23.6 million people will die by 2030. Which is considered to be the foremost cause of death. (Jayaraj , J.C., Davatyan , K., Subramanian , S.S., Priya, J., 2018).W HO report of 2019 says, 17.9 million people died due to cardiovascular diseases,

which is 32% of the overall worldwide deaths. (WHO 2021). Specifically, myocardial infarction is one of the most common types of coronary heart disease (CHD). (WHO 2014)**.** It happens when a coronary artery is partially or fully obstructed, which causes infarction of some heart muscle due to a reduction in blood supply. (Goldstein, J.A., Demetriou, D., Grines, C.L., Pica, M., Shoukfeh, M., O'Neill, W.W., 2020). In the US, every 40 seconds a case of myocardial infarction appears, while every 3 minutes and 30 seconds a fatality occurs due to stroke. (Heart Disease and Stroke Statistics, 2022). The latest estimates of MI cases in the USA are approximately 525,000 according to AHA data. (Roger, V.L., 2007). Each minute in the US, a mortality occurs due to myocardial infarction. (Benjamin, E.J., Blaha, M.J., Chiuve, S.E., Cushman, M., et.al.,2017). Coronary heart disease costs around two hundred billion dollars to the USA every year which includes medical treatment and healthcare services. (Heron, M., 2021). While in Asia specifically in China coronary heart diseases are the 2nd most cause of mortality. (Li, H., Ge, J., 2015). Similarly, the rate of deaths from CHD is very high in Eastern European countries. (F Levi,1 F Lucchini, E Negri, C La Vecchia, 2002). Mozzaffrian et al. conducted a comparison analysis for myocardial infarction (MI) in White males and females and black males and females. The study shows that the rate in the black gender was higher (12.9/100,000 males) compared to (9.1/100,000 males) in the white gender for the age group of 75-84 years. (Mozaffarian, D., Benjamin, E.J., Go, A.S., et.al., 2015).

In a report of 2014, according to the UK's national survey, on the prevalence of myocardial infarction, it is reported that 0.64 million men and 0.275 million women, which denotes an estimated 0.915 million MI victims in the United Kingdom. In 2013, it is found that the prevalence of myocardial infarction in men is three times higher compared to UK women. (B. Prachi, 2015).

The rates show clear statistics regarding how serious myocardial diseases are, which need attention in terms of the management of MI. Myocardial infarction disease patient management is a medical emergency. If it's possible the local guidelines must be implemented for the management of MI. Apart from this, in the management of MI, lifestyle and home remedies must be applied as discussed, avoid smoking, control blood pressure and cholesterol, regular medical checkups, exercise, healthy diet, control stress avoid alcohol, and therapeutic management. (C. S. Myo, 2021).

This study is conducted to represent a case that is based upon clinical data carried out in the cardiology ward, MTI, Hayatabad Medical Complex, Peshawar, KPK, Pakistan. Where both the prevalence and management of myocardial infarction are addressed.

Objectives of the Study

This study aims to: 1) discuss the prevalence of myocardial infarction; 2) determine the age-wise prevalence of 31 MI-diagnosed patients of HMC Peshawar; 3) analyze the Blood pressure and pulse rate of all MI-diagnosed patients of HMC, Peshawar.

Methodology

The steps taken during this case study are shown in Figure 1, furthermore, each step is explained in the sub-section of methodology.

Study Design. This case study is based upon descriptive observation design, performed on 31 myocardial infarction-diseased patients of Hayatabad Medical Complex.

Study Setting. In this study, MTI, Hayatabad Medical Complex (HMC), Peshawar, KPK, Pakistan cardiology was selected and referenced with a clinical clerkship. Hayatabad Medical Complex is one of the largest hospitals of KPK Province, which is a hub for postgraduate medical traineeship. It provides both medical and surgical specialties in almost all medical sections.

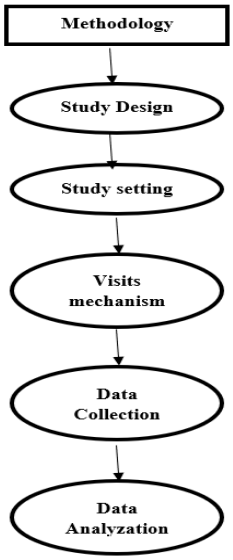

Figure 1. Steps involved in methodology regarding management and prevalence of myocardial infarction diseased patients of cardiology ward, MTI, Hayatabad Medical Complex, Peshawar, KPK, Pakistan

While, cardiology ward of HMC, is the largest in terms of capacity having 124 beds which is further subdivided i.e. 30 beds for interventional cardiology, 12 beds for CCU, 34 beds for cardiac electrophysiology, 34 beds for heart failure, 14 beds for pediatric cardiology. Also, approximately 2000 is outdoor patient turnover per year.

Visit mechanism. The frequency of visits was fixed at 6 days per week to the cardiology ward of HMC, in each visit the medication profiles were recorded properly for those patients who were hospitalized and diagnosed with myocardial infarction. In contrast, all those patients were excluded from this case study who were either not diagnosed properly or whose laboratory reports were not available properly.

Data Collection. A proforma is prepared to collect the data of those patients diagnosed with myocardial infarction. The proforma consisted of many points i.e. patient demographics, chief complaints, history of present illness, allergies, personal history, social history, family history, past medical reports, past surgical reports, review of systems, lab reports, diagnosis, hospital medication chart, and home treatment.

Data analysis. The data is examined properly by utilizing SPSS software and Microsoft Excel to draw results regarding the prevalence and management of myocardial infarction.

Results and Discussions

1. Prevalence of MI

Discussing the prevalence of myocardial infarction, a total 31 no of MI diagnosed patients having a mean average age of 62 years, were studied, where according to Table 1, 64.5% are male patients and the rest are female. Which shows high rates of MI in males compared to women.

Table 1
Patients Diagnosed with Myocardial Infarction at Cardiology Ward of HMC Peshawar

Gender	Frequency	Percentage
Female	11	35.5
Male	20	64.5
Total	31	100

Furthermore, HMC accepts patients from all over the province. Therefore these statistics represents the contribution to MI from the whole province admitted in HMC Peshawar. Figure-2, shows the statistics city-wise for MI-diagnosed patients where the highest value 14 (45.02% of the province) is for Peshawar city and 2nd highest is for Charsadda city. The reason for these highest values is the easy access to the said hospital.

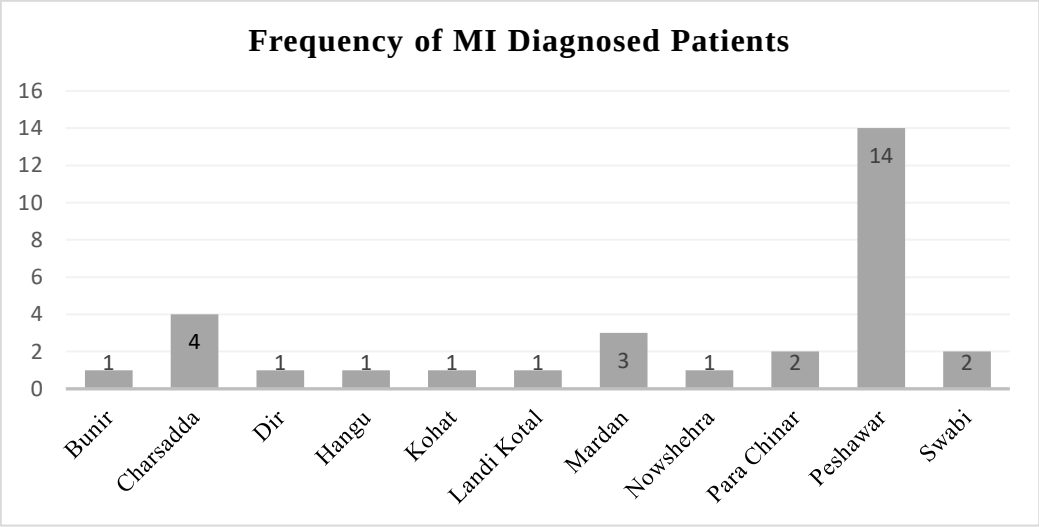

Figure 2. City-wise statistics of myocardial infarction-diagnosed patients of KPK Province admitted to HMC Peshawar

In this Case study the average mean age was 62 years for all 31 MI diagnosed patients, while the minimum and maximum values were 25 years and 100 years respectively. The different types of MI's are specified based on age gap in Table 2.

2. Age-wise prevalence of 31 MI-diagnosed patients of HMC Peshawar

The prevalence of MI shows the highest percentage of 61.29 for the age group of 51-75 years and the lowest 16.13% was found in the 76-100 years age group.

Table 2

Statistics age-wise prevalence of 31 MI diagnosed patients of HMC Peshawar

Type of MI diagnosed	Age gap (years)		
	25-50	51-75	76-100
AWMI	2	4	2
Acute AWMI	0	5	0
Acute ext. AWMI	0	1	0
Acute IWMI	2	1	0
Acute inferior +RV Infarc	0	1	0
Acute inferio-posterior MI	0	1	0
Antero Lateral Wall MI	0	1	0
Antero septal wall MI	0	1	0
IWMI	2	2	1
NSTEMI	1	2	2

The prevalence of MI shows the highest percentage of 61.29 for the age group of 51-75 years and the lowest 16.13% was found in the 76-100 years age group.

3. Management of MI

Here in this section, risk factors for MI, symptoms of MI, lab results, blood pressure analysis, pulse rate drug prescription will be touched for all 31 MI-diagnosed patients of Cardiology Ward, HMC Peshawar.

3.1. Risk Factors.

Risk factors found in these 31 MI-diagnosed patients are smoking, hypertension, and diabetes mellitus. Among these risk factors, hypertension was the most alarming with a value of 48% as shown in figure-3.

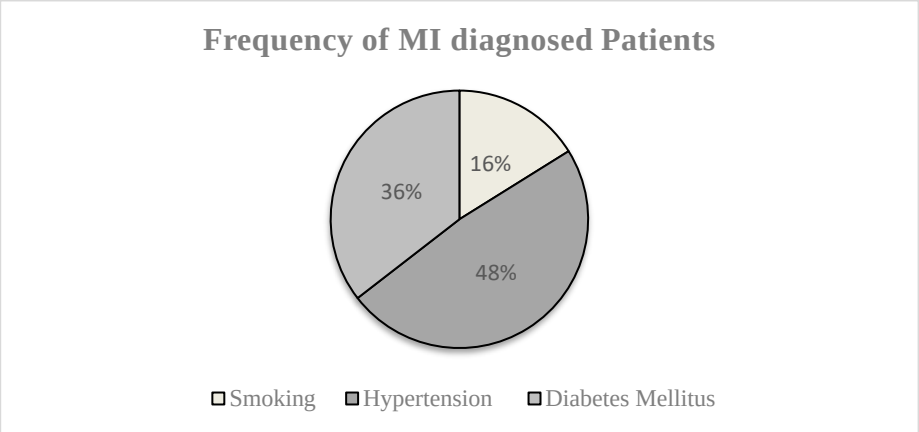

Figure 3: Frequency of risk factors in 31 MI-diagnosed patients of cardiology ward, HMC, Peshawar

3.2. Common Symbols

Similarly the four common symptoms i.e. chest pain, SOB, sweating, and nausea were determined in all 31 MI-diagnosed patients. The details are as shown in Figure 4. Chest pain was found in all 31 patients while sweating was found in 35.5% of 31 patients.

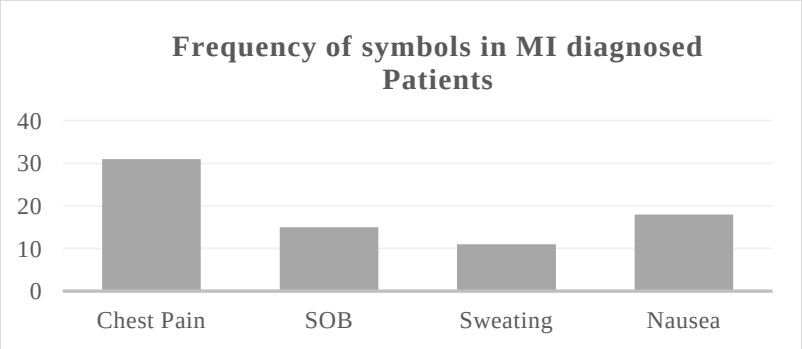

Figure 4: Frequency of four common symbols in 31 MI-diagnosed patients of HMC, Peshawar

Alongside it, patient data were collected from the laboratory and analyzed, CKMB and troponin I, were found with a lot of variation. While for other parameters the variations were found too in which one reason might be morbid conditions. The overall report is shown in Table 3.

Table 3
Lab reports off all parameters of 31 MI diagnosed patients of HMC, Peshawar

Parameters	Minimum value	Mean value	Maximum value
RBS	7.8 mmol/L	8.9 mmol/L	10.8 mmol/L
CKMB	5.8 IU/L	15.8 IU/L	23 IU/L
TROPONIN-I	0.01 ng/mL	0.021 ng/mL	0.04 ng/mL
Blood Urea	2.1 mmol/L	4.9 mmol/L	7.5 mmol/L
Creatinine	66.6 µmol/L	95 µmol/L	119.3 µmol/L
HGB	12.6 g/dL	13.503 g/dL	15.0 g/dL
ALT	5 U/L	0.7 U/L	30 U/L
Total Bilurubin	0.4 mg/dL	0.5 mg/dL	0.9 mg/dL
ALP	45 IU/L	93 IU/L	140 IU/L
Chloride	100mEq/L	102 mE/L	104 mEq/L
Sodium	137 mEq/L	140 mEq/L	144 mEq/L
Potassium	3.7 mmol/L	4.2 mmol/L	5.0 mmol/L

3.3. Blood Pressure and Pulse Rate Analysis

In this analysis blood pressure and pulse rate, highest, lowest and mean average values are carried out as shown in table-4.

Table 4
Blood pressure and pulse rate analysis of all MI-diagnosed patients of HMC, Peshawar

Parameter		Minimum Value	Maximum Value	Mean value
Blood Pressure	Systolic BP (mmHg)	85	195	129.45
	Diastolic BP (mmHg)	50	110	81
Pulse rate	Per minute	58	130	83.58

3.4. Drugs prescription

In this hospital, the drugs prescribed to these 31 MI diagnosed patients were, Streptokinase, Clopidogrel, Rosuvastatin, Glyceryl Tri Nitrate, Ramipril, Ticagrelor, Aspirin, Clopidogrel + Aspirin, Heparin, Lisinopril, Losartan, Prasugrel HCL, Isosorbide, Dimenhydrinate, Enoxaparin, Carvedilol, Bisoprolol, Metoprolol, Furosemide, Domperidone, Omeprazole, Human Regular Insulin, Insulin Glargine, Amiodarone, Adrenaline, Nalbuphine, and Dopamine to 17, 27, 28, 10, 11, 103, 28, 08, 02, 01, 03, 02, 01, 03, 25, 01, 13, 07, 06, 01, 06, 08, 03, 01, 01, 03, and 01 patients respectively.

Conclusion

Myocardial infarction is one of the main causes of fatalities in developed countries, with prevalence approached to millions of people. In this case study it is found that AWMI was the common type of myocardial infarction in most of the patients, while the rate of MI was higher in male patients compared to women. Similarly, the MI rate was higher in 51-75-year-old patients. Apart from that, chest pain and SOB were the most common symptoms found, and the higher risk factor was hypertension. A high level during laboratory was determined for biomarkers i.e. CKMB and troponin. Clopidogrel, Aspirin, Rosuvastatin, and Enoxaparin were the common suggested prescription.

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