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RESEARCH ARTICLE

Frequency of Risk Factors of Myocardial Infarction among Men and Women at Hayatabad Medical Complex, Peshawar

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ABSTRACT

Background: Myocardial Infarction is the leading cause of morbidity and mortality all over the world. Its Prevalence is specifically high in the South Asian countries. The developing countries share a large burden of this disease, accounting for more than 80% of the world's burden. The primary objective of this study was to determine the proportion of male and female patients diagnosed with myocardial infarction (MI) at Lady Reading Hospital, Peshawar. Additionally, the study aimed to identify the most common risk factors associated with MI, analyze their Prevalence across genders, and examine the age-wise distribution of these risk factors. **Methods:** The study was based on the cardiology and emergency departments of HAYATABAD MEDICAL COMPLEX, Hospital, Peshawar. 205 MI patients were included in the study. Verbal and written informed consents were received from all the participants. SPSS version 23 was used to analyze the data. **Results:** The study included 205 patients, with 62% males (n=127) and 38% females (n=78). The age group with the highest Prevalence of myocardial infarction (MI) was 46-55 years (32.7%), followed by 66-75 years (28.8%) and 56-65 years (26.3%). Hypertension (69.8%) and dyslipidemia (64.4%) were the most common risk factors, followed by diabetes (49.3%), family history of MI (48.8%), smoking (22%), and obesity (21%). Hypertension was slightly more prevalent in females (73.1%) than males (67.7%), while smoking was exclusive to males (35.4%). Obesity and diabetes were more common in females. **Conclusion:** The study concludes that there is a high prevalence of myocardial infarction among males, with the most affected age group being 46-55 years. Hypertension and dyslipidemia emerged as the most significant risk factors, with notable gender differences observed. Females showed a higher prevalence of hypertension and diabetes, while smoking was exclusively observed in males. These findings underscore the need for targeted interventions to address gender-specific risk factors and promote early prevention strategies.
Keywords: Ischemic Heart Disease (IHD), Coronary Artery Disease (CAD), Electrocardiogram (ECG), Hayatabad Medical Complex (HMC)

INTRODUCTION

Ischemic Heart Disease (IHD) is a class of cardiac disorders that are caused by inadequate or insufficient blood supply to the heart. A life-threatening condition among ischemic heart diseases, both among men and women, is Myocardial Infarction (MI), commonly known as Heart Attack [1]. Myocardial Ischemia, a condition characterized by a reduced blood supply to the heart, plays a major part in the development of Myocardial Infarction (MI). This state of decreased blood supply, when maintained for a long period, causes necrosis of the heart cells, leading to Myocardial Infarction (MI). Myocardial Infarction (MI) is the result of arteriosclerosis [2]. It occurs when a plaque forms in the lumen of coronary arteries due to within the coronary artery, resulting in a reduction or total blockage of blood supply to the heart muscle. This results in necrosis or death of the heart muscles, which is called Myocardial Infarction. Similarly, the diagnosis of MI is generally done because of a history of chest pain for 20 minutes or greater than 20 minutes, accompanied by serial ECG changes and the presence of cardiac biomarkers. Chest pain may radiate to the epigastrium, shoulder, back, left arm, wrist, or even jaw. The pain is even more severe with physical exertion. Pain is usually accompanied by indigestion, as the pain generally originates in the epigastric region. MI may also occur without symptoms. It may be detected only by ECG, cardiac imaging, or other studies. Some populations are liable to present later with MI symptoms, including women, elderly patients, and people with diabetes [3]. Based on the severity and duration of symptoms, the general appearance of patients may also vary. Severe distress and restlessness may be seen with tachypnoea. Pallor and decrease in temperature of the skin may also be noted.

On the contrary, some patients develop a low-grade fever. Blood pressure may be high in some patients while low in others. The pulse can become irregular, and the patient may be prone to arrhythmia. Myocardial Infarction is not only in itself a life-threatening condition, but it is also associated with fatal complications [4]. Even if the patient survives the initial insult due to MI, the lifestyle of the patient is greatly influenced as many lethal complications may occur either due to the disease itself or due to mismanagement of the conditions or the effects of drugs. Some of the major complications of Myocardial Infarction include cardiac failure, cardiogenic shock, and mitral regurgitation. Cardiogenic shock is the highest cause of in-hospital mortality. Ventricular aneurysms may be seen in about 10% of patients with MI [5]. Cardiac arrhythmia is the most common complication seen in MI patients. The most frequent arrhythmias that MI patients may develop include atrial fibrillation, ventricular tachycardia, and ventricular fibrillation, followed by heart block.

Furthermore, elderly and diabetic patients are more likely to develop complications of MI [5, 6]. Myocardial Infarction (MI) has the highest rate of mortality and morbidity across the globe [7]. It is responsible for 17.3 million deaths annually. It will most probably rise to more than 23.6 million in the next decade [4, 7]. It is generally believed that cardiovascular diseases are common in developed countries due to urbanization and lifestyle changes. However, the facts and figures completely contradict this perception. The biggest burden of this disease, a shocking 86%, is suffered by developing countries, including Pakistan. 80% of the fatalities of this disease belong to the developing countries. Pakistan also carries a large burden of this disease, i.e., 5 million [8, 9]. The Asian population is more likely to develop Myocardial Infarction. Studies have shown a 50% increase in the Prevalence of Myocardial Infarction (MI) in Asians, especially South Asians, as its incidence in South Asia is 50% higher than in the English population [9, 10].

Moreover, it is anticipated that the burden of Myocardial Infarction (MI) in South Asia will increase by more than 2 times in the next two decades. South Asians living in Western countries also have higher rates of mortality and morbidity as compared to the local Western communities. This fact excludes the regional or geographical determinants of MI in South Asia [7, 10]. Pakistan, being a developing South Asian country, has a very high disease burden of cardiovascular diseases, including Myocardial Infarction (MI). A cross-sectional study carried out in Pakistan concluded that 25% of middle-aged adults have CAD [8, 10]. The death rate of coronary disease in Pakistan has increased by a staggering 135% over the last 23 years [5]. Extensive literature has described differences in the incidence risk factors and pathophysiology of coronary heart disease according to age and gender [11]. Women of reproductive age have a lower tendency to develop MI as compared to men less than 50 years of age. However, after 50 years, the incidence of Myocardial Infarction in women gradually rises, and at the age of 80 years, both sexes have almost similar rates of morbidity. This fact is generally associated with the influence of female sex hormones, oestrogen, and progesterone on the cardiovascular system.

However, the difference in eating habits and smoking may also be the cause of this difference in morbidity [12]. The rise in risk factors of Myocardial Infarction is a major contributor to the rise of disease prevalence. The major risk factors for Myocardial Infarction, according to the Framingham study, are hypertension, hyperlipidaemia, diabetes, smoking, and obesity [10, 12]. About 18% of adults in Pakistan are hypertensive; 16.2% of Pakistani men and 11.7% of women have diabetes. A rise in smoking and obesity has also been seen [13]. A sedentary lifestyle is also a major contributor to the burden of cardiometabolic diseases. With the advances in technology and increasing comfort and facilities, the tendency to develop a stationary lifestyle has greatly increased. There is limited outdoor activity, and the tendency to exercise regularly has also diminished. As a result, people are more likely to develop atherosclerosis and other metabolic conditions, which in turn greatly affect the circulation of blood due to the narrowing of blood vessels. Consequently, heart diseases like Myocardial Infarction and stroke have become the most common causes of death in Pakistan as well as other middle-income countries [14]. The risk factors for Myocardial Infarction may be modifiable or non-modifiable. Non-modifiable risk factors include family history, ethnic group and age whereas hypertension, smoking, dyslipidaemia, obesity, diabetes, sedentary lifestyle, bad diet or dietary habits and alcohol consumption are modifiable risk factors of Myocardial Infarction (MI) [14].

Similarly, 33% of Pakistan's population is hypertensive while diabetes is present in 25% of the population. Drug abuse, smoking and psychosocial issues are not considered as risk factors, but they do have a role in worsening the situation [14, 15]. The American Heart Association (AHA) in 1997 concluded that the leading risk factors of coronary heart disease in females are tobacco consumption, high blood pressure, dyslipidaemia, diabetes, obesity, immobility and malnutrition. The occurrence of Myocardial Infarction is also affected by education level, profession and social class as well as psychological condition [10, 15, 16]. In a study conducted in Pakistan, very few women had no conventional risk factors, with men on the contrary. Diabetes and hypertension are more commonly found in women while dyslipidaemia was more frequent in men. Smoking is not a risk factor associated with females, as it is against conservative beliefs [8, 16]. The aim of this study was to determine the proportion of male and female patients diagnosed with Myocardial Infarction (MI) at Hayatabad Medical Complex, Peshawar, and identify the most common associated risk factors. The study also aimed to analyse the distribution of these risk factors by gender and age. The specific objectives were to compare the frequency of MI between men and women, identify the most common risk factors associated with MI, and evaluate the leading risk factors for MI among men and women in the hospital.

MATERIALS AND METHODS

The study was conducted in the Cardiology Ward, CCU, and Emergency CCU of Hayatabad Medical Complex (HMC), Peshawar. The population included patients diagnosed with Myocardial Infarction (MI) who were undergoing treatment at HMC. A total of 205 patients were enrolled in the study after obtaining informed consent, which the Research Ethical Committee of HMC had approved. The study took place over four months, from March 2022 to June 2022. This was a cross-sectional study, and convenience sampling was used to include MI patients admitted to HMC who provided informed consent. All patients had an equal opportunity to participate. The inclusion criteria consisted of male and female patients aged 25–75 years who were diagnosed with MI. However, mentally disabled patients, those with congenital heart defects, and those with other chronic medical conditions were excluded.

DATA COLLECTION PROCEDURE

Data for this cross-sectional study were collected over four months (March–June 2022) from 205 myocardial infarction (MI) patients admitted to the Cardiology Ward, CCU, and Emergency CCU of Hayatabad Medical Complex, Peshawar. Convenience sampling was used, and patients aged 25–75 years who consented and met the inclusion criteria were enrolled. Ethical approval was obtained, and patients with mental disabilities, congenital heart defects, or other chronic conditions were excluded.

STATISTICAL ANALYSIS

Data was analysed using SPSS version 23. Descriptive analysis was used to determine the frequencies of all risk factors, and chi-square tests were applied to identify gender differences and the age-wise distribution of risk factors. All statistical assumptions for these tests were met. The data collection process involved investigators visiting MI patients in their respective wards,

explaining the aims of the study, and requesting their participation. Patients who agreed to participate were conveniently enrolled in the study.

RESULTS

Our study included 205 patients, out of which 62% (n=127) were male while 38% (n=78) were female (Figure 1)
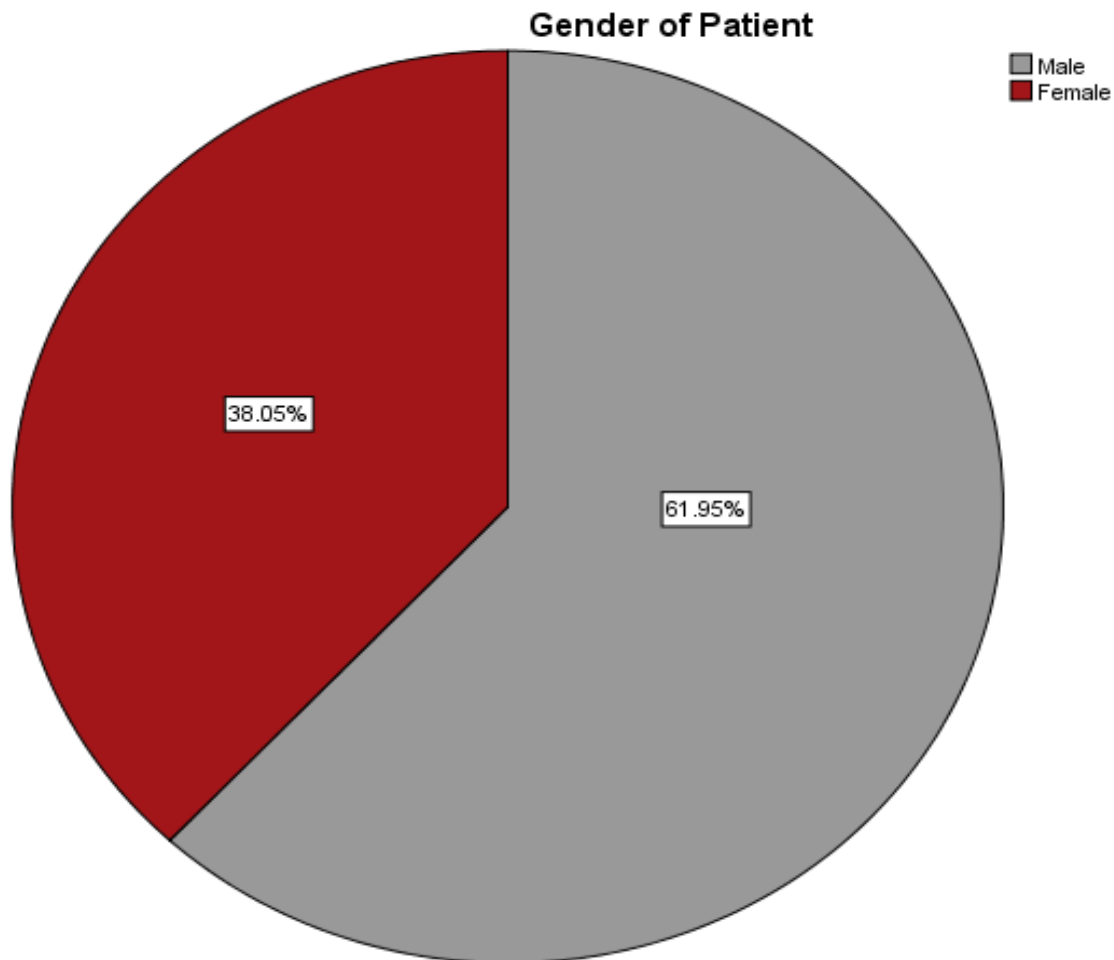

Figure 1: Proportion of Male and Female Patients with MI

Patients were divided into five age groups. Those within the bracket of 25-35 years were 4.4% (9), 36-45 years were 7.8% (16), 46-55 years were 32.7% (67), 56-65 years were 26.3% (54) and 66-75 years were 28.8% (59). (Fig 3.2). Table 3.1 demonstrates that the most frequent risk factor was hypertension, present in 69.8% of patients, followed by dyslipidemia (64.4%), diabetes (49.3%), family history of MI (48.8%), smoking (22%), and obesity

Table 1: Frequency of Risk Factors of Myocardial Infarction

Risk factor	Frequency	Percentage
Hypertension	143	69.80%
Dyslipidemia	132	64.40%
Diabetes	101	49.30%
Family History of MI	100	48.80%
Smoking	45	22%

Obesity	43	21%

Hypertension and dyslipidemia were equally high in both men and women. Obesity and diabetes were more associated with females, while smoking was predominantly present in males. Table 2 demonstrates that hypertension was slightly higher in women. Among males, 67.7% were hypertensive, while in females, the frequency of hypertension was 73.1%.

Table 2: Gender Distribution of Hypertension

			Hypertensive		Total
			Yes	No	
Gender of Patient	Male	Count	86	41	127
		% Within Gender of Patient	67.7%	32.3%	100.0%
		% Within Hypertensive	60.1%	66.1%	62.0%
		% of Total	42.0%	20.0%	62.0%
	Female	Count	57	21	78
		% Within Gender of Patient	73.1%	26.9%	100.0%
		% Within Hypertensive	39.9%	33.9%	38.0%
		% Of Total	27.8%	10.2%	38.0%

According to the figure, smoking was only found in males, with a frequency of 35.4%. There was not a single case of a female smoker in our study.
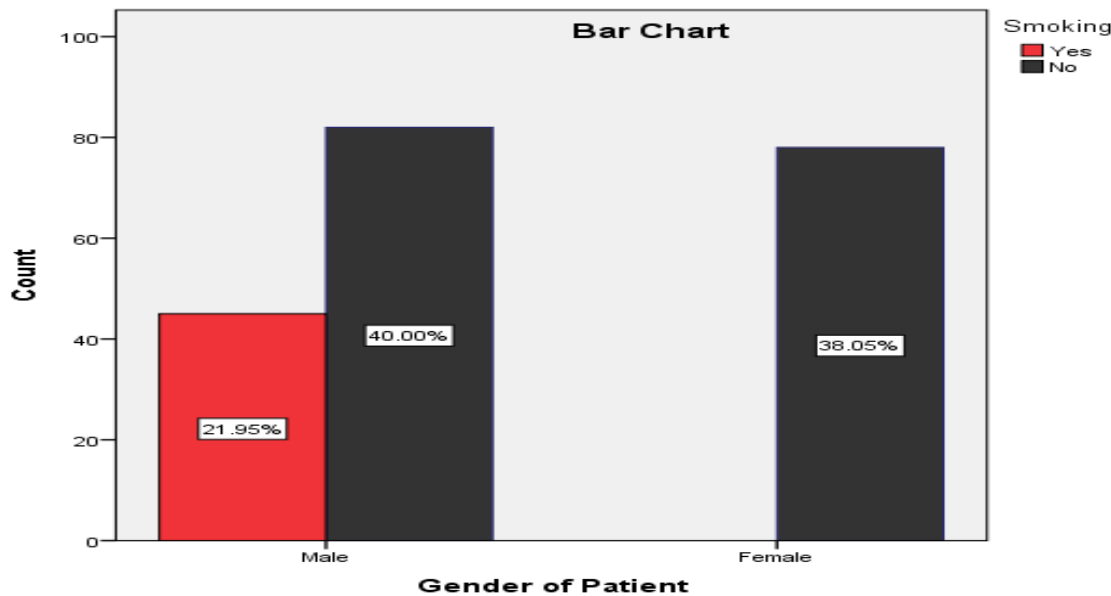

Figure 2: Smoking Among Patients

DISCUSSION

Myocardial Infarction is a disease of growing magnitude all over the world, especially in South Asia. Its morbidity and mortality are particularly high in the developing countries. Pakistan, being a developing country, is also facing a continuing rise in the number of victims of this disease. The reason for this increasing morbidity is the rise in the frequency of its risk factors, out of which the leading risk factors are hypertension, dyslipidaemia, diabetes, obesity, family history, smoking, and sedentary lifestyle. Another study conducted in Karachi produced similar results. It was also male subjects where the male proportion was 65.2%, whereas 34.8% were females [17]. In our study, THE Common risk factor was present in 69.8% of patients, followed by dyslipidaemia (64.4%), diabetes (49.3%), family history (48.8%), smoking (22%), and obesity (21%). Our study corroborates with the findings of previous studies regarding the significance of risk factors causing cardiovascular pathology. The study conducted in Karachi in 2016 found that dyslipidaemia was present in 91.2% of patients, while 70.4% were hypertensive, 51.2% were diabetic, and 40% had a family history of MI [17]. Our study resembles the results of a previous study in Karachi, which showed that diabetes and hypertension were more common in females. The frequency of diabetes in women was 62.1% as compared to males which was 45.4%. 79.3% of their female participants were hypertensive as opposed to men, who were 65.6% hypertensive. They took 87 female participants, out of which only 8 (9.2%) were smokers. The frequency of smoking in men was 39.9%. Dyslipidaemia was very high and was almost equal in men and women (92% and 89.7% respectively).

However, the study revealed that obesity and diabetes were more common among females, while males were more affected by smoking. These gender-specific differences support the need for gender-sensitive approaches to target individual risk factors, as was suggested in prior studies. The age distribution is also like the previous studies that identified MI patients as middle-aged and elderly populations [18]. This age pattern is different from other studies done on younger populations where the MI was more associated with lifestyle factors such as smoking and stress.

Furthermore, focusing on the management of primary risk factors, including hypertension and dyslipidaemia, while at the same time adopting gender and age considerations makes it easier to deal with MI [18]. A comparison with global meta-analyses on anaemias in MI patients, which compare outcomes based on age and region, provides additional information about the need for integrated, context-based approaches. For example, the prevalence of anaemia is higher in older MI patients, which aligns with the current study that targets the older age groups as vulnerable groups. The studies done in Pakistan by Memon et al. and Ahmad et al. also reveal that more men are affected by MI and that hypertension and smoking are the main causes [4, 19]. These results also support the current study's results but also show regional differences, including increased mortality among local populations. The results of the study align with a vast number of prior studies and stress the need for gender- and age-specific approaches to addressing MI. Nevertheless, the sex-specific Prevalence of hypertension, as well as the differences in the age distribution of hypertension, are valuable supplementary insights, indicating directions for future studies and interventions.

LIMITATIONS AND RECOMMENDATIONS

The main reason for the rise in MI morbidity and mortality is the increasing burden of its risk factors. Most of these risk factors are modifiable and can be minimized through changes in lifestyle and dietary habits and maintaining a good quality of life. Communities should be properly educated through public awareness programs, seminars, workshops, etc., on how to minimize risk factors and how to prevent MI if the risk factors are already present. Hypertension, dyslipidaemia, and obesity can be controlled through a healthy diet and regular exercise. Smokers should be made aware of the unhealthy effects of smoking. Electronic and social media can be used to have a good effect in this regard. On the clinical level, prompt and effective management strategies and interventions should be followed and implemented to minimize the risk of complications and mortality.

CONCLUSION

The major risk factors of MI are hypertension, dyslipidaemia, diabetes, smoking, family history, and obesity. In our study, the male proportion of MI patients was dominant over the female proportion. Hypertension was the most common risk factor, followed by dyslipidaemia, diabetes, family history, obesity, and smoking. Hypertension and dyslipidaemia were equally high in

both men and women. Diabetes and obese patients were more commonly females. Smoking was predominantly found in males. There was not a single case of smoking among the female participants.

CONFLICT OF INTEREST
No potential conflict of interest relevant to this article is reported.

AUTHOR CONTRIBUTION
Zeeshan Ahmad Khan contributed significantly to the conceptualization of the research, ensuring the study's direction aligned with its objectives. Naveed Ullah Khan was actively involved in data collection and provided key support in the analysis phase, maintaining precision and reliability in the findings. Khan Zameer facilitated the research process by coordinating logistical aspects, ensuring a smooth workflow throughout the study. Shah Imad contributed to the manuscript's development, refining its content and structure to enhance clarity and impact.

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