



ACUTE MYOCARDIAL INFARCTION; FREQUENCY OF MODIFIABLE RISK FACTORS

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ABSTRACT: The frequency of modifiable risk factors of acute myocardial infarction varies greatly in different countries and populations of the world. **Objective:** To find out the frequency of modifiable risk factors in patients with acute myocardial infarction. **Design:** Cross-sectional study. **Setting:** Cardiology Department. Ayub Teaching Hospital Abbottabad, **Period:** 1st Jan 2015 and 30th June 2015. **Material and Methods:** A total of 224 patients of acute myocardial infarction Patients were enquired about the presence of hypertension, diabetes mellitus, smoking and family history of ischemic heart disease. Fasting blood sugar and lipid profile were recorded. **Results:** Out of 224, 90.6% patients had at least one risk factor. Hypertension was found to be the most common risk factor (55.4%), followed by smoking (43.8%) and Diabetes Mellitus (27.2%). Dyslipidemia was found to be the least common (23.2%) risk factor. **Conclusion:** Hypertension is the most common modifiable risk factor in patients of acute myocardial infarction, followed by smoking and diabetes.

Key words: Acute myocardial infarction, modifiable risk factors, Hypertension

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INTRODUCTION

Acute myocardial infarction (AMI) is one of the most common diagnoses in hospitalized patients in industrialized countries. The early (thirty days) mortality rate from AMI is 30%.¹ About 37% of people who experience a coronary attack will die in the same year.² The people of Indo-Asian origin have a high burden of coronary artery disease (CAD) which is now the leading cause of death in the Indo-Pakistan subcontinent.³

According to the INTERHEART study report, nine factors are responsible for 90% of myocardial infarctions.⁴ Modifiable risk factors include Diabetes mellitus, smoking, hypertension, hyperlipidemia, sedentary life style, obesity, stress and depression.^{5,6}

Risk factors for ischemic heart disease and Acute Myocardial Infarction are on the rise in Pakistan. Eighteen percent of adult population suffers from hypertension. Smoking and tobacco use has increased and obesity is on the rise.⁷ Diabetes mellitus(DM) is found in 16.2% men

and 11.7% women.⁸ Diabetes increases the risk of cardiovascular diseases (CVD) and mortality by about four times in women and about twofold in men. The combination of several risk factors further enhances the risk.^{4,5} Zia has reported that 30% of patients with an episode of myocardial infarction had type II diabetes mellitus.⁹ Treatment of hypertension and dyslipidaemia causes reduction in risk of myocardial infarction (MI).¹⁰ Increasing level of smoking increases the risk of AMI. Smoking is on the rise in many low and middle income countries, especially among young people and women.¹¹

As there is variability in the prevalence of risk factors in different populations, a highly potent factor in one country could be less important in another one. *Data is scanty on the level of knowledge about coronary artery disease (CAD) in Pakistani population.* This study is an attempt to highlight the importance of modifiable risk factors of AMI in our population.

MATERIAL AND METHODS

Our study was a cross-sectional survey of 224 patients with acute myocardial infarction who presented in the Cardiology Department of Ayub Teaching Hospital, Abbottabad from 1st Jan 2015 to 30th June 2015. Diagnosis of AMI was based on international criteria.¹² Patients were interviewed on a structured proforma. Verbal consent was taken from the patients who were willing to participate. In addition to collecting basic demographic details, patients were asked about their hypertension and diabetes mellitus status. Information was also obtained regarding smoking and history of ischemic heart disease in first degree relatives. Patients with AMI having age above 18 years were included in the study. Patients having recurrent MI and family history of ischemic heart disease were excluded from the study. Diagnosis of DM was based on past diagnosis by a physician, intake of anti-diabetic medications or post-admission

fasting blood sugar values using the 1999 diagnostic criteria recommended by the World Health Organization (WHO).¹³ Hypertension was attributed if blood pressure exceeded $\geq 140/90$ mmHg, or if a patient was on anti-hypertensive medication. Subjects were considered to have dyslipidemia if either cholesterol or triglycerides was increased (cholesterol ≥ 5.2 mmol/L, triglycerides ≥ 1.69 mmol/L).¹⁴ Smoking was defined as smoking of at least 100 cigarettes during lifetime. The data was managed using Statistical package for social sciences (SPSS, v17). P-value was calculated by student t-test for the risk factors and it was found to be significant if p-value was ≤ 0.05 .

RESULTS

Our study included 224 cases of acute myocardial infarction. Gender and age distribution was as shown in Table-I.

Gender	No. of patients	Minimum	Maximum	Mean	Std. Deviation
Female	69(30.8%)	31	95	61.14	13.018
Male	155(69.2%)	26	90	57.66	13.054
Total	224(100%)	26	95	58.74	13.113

Table-I. Age distribution

Distribution of different risk factors is shown in Table-II. Hypertension was found to be the most common risk factor (55.4%).

Risk factor	No. of patients	Percentage (%)
Hypertension	124	55.4
Smoking	98	43.8
Diabetes Mellitus	61	27.2
Dyslipidemia	52	23.2

Table-II. Frequency of risk factors

Hypertension was significantly more frequent in females ($p=0.016$) while smoking was more in males ($p=0.00$). Diabetes mellitus was significantly more common in females ($p=0.001$). Gender difference was statistically insignificant ($p=0.57$) for dyslipidemia, as is shown in Table-III.

P-value	No	Yes	Gender	Risk factor
0.016	77(49.7%)	78(50%)	Male	Hypertension
	25(33.3%)	44(66.7%)	Female	
0.000	61(39.4%)	94(66.6%)	Male	Smoking
	65(94.2%)	4(5.8%)	Female	
0.001	123(79.4%)	32(20.6%)	Male	Diabetes Mellitus
	40(58%)	29(42%)	Female	
0.57	119(76.8%)	36(23.2%)	Male	Dyslipidemia
	53(76.8%)	16(23.2%)	Female	

Table-III. Gender distribution of risk factors

DISCUSSION

Ischemic heart disease is responsible for about 40% deaths in Western countries. Acute myocardial infarction is one of the major health problems throughout the world.¹⁵ Cardiovascular diseases like myocardial infarction and stroke have become the leading causes of mortality and morbidity in Pakistan. Comprehensive data of the profile and characteristics of AMI patients in Pakistan is not only inadequate but also major surveys have not been published.¹⁶

Acute Myocardial Infarction Risk Factor Assessment in Brazil (AFIRMAR) reported that smoking, diabetes mellitus, waist to hip ratio, hypertension, hyperlipidemia and family history of CAD were the main risk factors for AMI.⁷

Acute myocardial infarction is more common in males who are affected at a relatively younger age compared to females. Coronary artery disease affects South Asians at a relatively younger age as compared to western population.^{17,18} Our study included 224 cases of acute myocardial infarction. Of these, 69.2% were males and 30.8% were females. Our results match those of Abbas et al and Ahmed who showed that 73.8% of AMI patients were male.¹⁹ Shafique et al also found that majority (87%) of AMI of patients were male.²⁰ Male patients were also a dominant entity (85%) in another study conducted in USA and Canada.²¹ Similarly data of Singapore Myocardial Infarction Registry, between 1988 and 1997 showed that men were four times more prone to have acute MI than women.²²

In a study, comparing ACS in South Asians with Caucasians, it was found that Asians are affected at about 10 years younger age.²³ In our study, mean age was 58.74 ± 13.113 years. Our patients mean age was slightly higher than other studies conducted in the region but lower than western population. Jafary et al found mean age of patients with AMI to be 52.5 ± 10.8 years.¹⁶

Wilson and Agostino et al showed that hypertension is an important risk factor associated with AMI.²⁴ In our study hypertension was found

to be the most common risk factor associated with AMI being present in 55.4 % of patients. Hypertension was significantly ($p=0.016$) more common in females (66.7%) than male patients (50.3%). Hypertension also figured prominently in a study by Jafary et al who showed that more than half (55.2%) of the AMI patients had hypertension.¹⁶

Smoking appeared to be the second most common risk of AMI in our study and was noted in 52% patients. Jafary et al also showed similar results.¹⁶ In our study, smoking was significantly ($p=0.00$) more common in male patients (66.6%) than females (5.8%). A study, conducted in Punjab institute of cardiology, showed that smoking was the most prevalent (63.4%) risk factor in young coronary artery disease patients.²⁵ Begom et al showed that smoking was 44.6% prevalent in male patient with coronary artery disease.²⁶

Diabetes increases risk of coronary heart disease (CHD) by two to four times.²⁷ In a hospital based case control study, conducted in a rural population of India, cases of AMI were twice as likely to have history of diabetes compared to controls.²⁸ In our study diabetes mellitus was noted in 27.2% of patients. It was important to note that diabetes was significantly more prevalent ($p=0.001$) in female patients (42%) than males (20.6%).

Ridker et al demonstrated that total cholesterol was significantly high in patients with AMI than controls.²⁹ In our study 23.2% patients had hyperlipidemia. Our results were similar to those of Ahmed and Shafique.²⁰ They noted that 19% of AMI patients had hyperlipidemia. Jafary et al showed that 18.2% of AMI cases had hyperlipidemia.¹⁶ A study, carried out in rural population of India, found that hyperlipidemia was not significantly associated with AMI.²⁷ A study conducted in Latin America found that significantly higher risk of AMI was associated with hyperlipidemia.¹¹

CONCLUSION

From our study, it is concluded that hypertension is the most common while dyslipidemia is the least common risk factor of AMI. Hypertension

and diabetes mellitus are significantly more common in females while smoking is significantly more common in males. Dyslipidemia is equally prevalent in both genders.

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*“See the bad inside yourself,
and see the good inside others.”*

Imam Ali (AS)

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