FREQUENCY OF HYPERTENSION, DIABETES MELLITUS, AND CIGARETTE SMOKING IN PATIENTS PRESENTING WITH ST-ELEVATION ACUTE MYOCARDIAL INFARCTION

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ABSTRACT

Objectives: The objectives of our study are to determine the frequency of hypertension, diabetes mellitus, and cigarette smoking in patients presenting with ST-elevation acute MI.

Material and methods: A descriptive cross-sectional study, was carried out in the Department of Medicine and Cardiology, Khyber Teaching Hospital, Peshawar, from June to December 2019, after proper approval from IREB, keeping a 95% confidence interval and 6% margin of error under WHO sample size calculator. The data so recorded, was analyzed in SPSS version 23. Mean ± Standard deviation was calculated for continuous variables like age. The modifiable risk factors (diabetic mellitus, hypertension, and smoking), were stratified among age and gender to see the effect modifications. Post-stratification Chi-square test was applied in which p-value ≤0.05 was considered significant.

Results: Out of 243 patients, 57% were males and the rest 43% were females. The mean age of patients was 64 years with SD ±10.69. Hypertension was recorded in 69%, cigarette smoking in 43%, and diabetic mellitus in 37% of patients presenting with acute ST-elevation myocardial infarction.

Conclusion: The frequency of modifiable risk factors i.e. hypertension, smoking, and diabetic mellitus, was quite significant, in patients presenting with acute ST-elevation myocardial infarction.

Keywords: Acute ST-elevation myocardial infarction, diabetic mellitus, hypertension, cigarette smoking.

This article may be cited as: Iqbal S, Mahmood B, Khan HA, Iqbal MD. Frequency of Hypertension, Diabetes Mellitus, and Cigarette smoking in patients presenting with ST-elevation acute Myocardial infarction. J Med Sci 2023 January;31(1):47-50

INTRODUCTION

Worldwide acute myocardial infarction (MI) is the leading cause of death. Its annual incidence in the United States is estimated to be 600000 new cases and 320000 recurrent attacks. Every fifth middle-aged Pakistani adult has been reported to have coronary artery disease (CAD).[1,2] Acute myocardial infarction (MI) occurs due to irreversible necrosis of cardiac muscle due to prolonged ischemia. Myocardial ischemia may present as acute coronary syndromes (ACSs), which include unstable angina (USA), ST-elevation MI (STEMI), or non–ST-elevation MI (NSTEMI). Most of the patients with ST-segment elevation MI will develop Q waves. Patients without ST-elevation myocardial ischemia will be diagnosed as unstable angina or NSTEMI depending upon the normal or elevated serum cardiac enzymes.[3,4]

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Date Received: 02-09-2022
Date Revised: 03-10-2022
Date Accepted: 07-03-2023

Identification of individuals at high risk of STEMI and its consequences by risk stratification remains a significant issue in the prevention and management of Acute STEMI.[5] About nine most common risk factors for obesity are diet, alcohol consumption, reduced physical activity, smoking, hypertension, diabetes mellitus, dyslipidemia, and psychosocial factors, that account for over 90% of the patients who have suffered from acute MI.[6] The INTERHEART investigators have reported that almost all people, regardless of race or ethnic group they belong, throughout the world have some of the combinations of the above risk factors. Some of these risk factors are interlinked with each other and may predispose to the development or worsening of other factors, for example, the risk of developing T2DM, increases with increasing age,[7,8]obesity,[8,9] and lack of physical activity.[8,10]

Diabetes mellitus is a component of metabolic syndrome, the other components of which include abdominal obesity, hypertension, hypertriglyceridemia, and low serum HDL cholesterol.[11] The risk of acute MI has been reported to increase by 40% by cigarette smoking 1-5 cigarettes per day.[12,13] Unfortunately, it has been observed that cigarette smoking is gradually increasing among young people and ladies in some of the many low and middle-income countries.[14] The risk of coronary events diminishes by fifty percent at one year of cessation of smoking. Hypertension is also a well-established risk factor for adverse

cardiovascular outcomes.[6,15] A study conducted in Karachi on STEMI patients revealed that 45% had hypertension, 41% had smoking, 35% had diabetes mellitus& 33% had dyslipiemia[16]. Abstaining from smoking, and controlling blood glucose, hypertension, and dyslipidemia reduces the risk.

The rationale of our study is to determine the frequency of hypertension, cigarette smoking, and diabetes mellitus in our patients presenting with acute STEMI. This will help us to make a policy for launching an effective awareness program for the prevention and long-term management of ischemic heart disease.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted in the Department of Medicine and Cardiology Khyber Teaching Hospital, Peshawar, after approval from the hospital research and ethical committee from Jan. to December 2019. We enrolled 243 consecutive patients, keeping a confidence interval of 95% and a 6% margin of error as per the WHO sample size calculator[13].

The Inclusion Criteria were all the diagnosed cases of Acute STEMI, of either gender after written informed consent. The patients who declined consent or suffered from other and multiple comorbid conditions for example chronic renal failure or chronic liver disease were excluded from our study to avoid confounders and bias in the results.

After detailed history and meticulous clinical examination, the modifiable risk factors (diabetic mellitus, hypertension, and cigarette smoking) thus recorded, were analyzed in SPSS 23. Because we had no financial grants available so we have not included other risk factors in our study. Mean ± standard deviation was calculated for continuous variables like age. Percentages and Frequencies were calculated for categorical variables like gender and modifiable risk factors.

Modifiable risk factors were stratified amongst age and gender, a post-stratification chi-square test was applied, and a p-value of ≤0.05 was considered significant.

Table 1: Age Distribution

Age	Frequency	Percentage
30-50 years	73	30%
51-60 years	80	33%
61-70 years	90	37%
Total	243	100%

RESULTS

The mean age of our patients was 64 years with SD ±10.69 (table1), 57% of patients were males while 43% were females, Diabetic mellitus was found in 90(37%), hypertension in 198(69%), and cigarette smoking in105(43%) of patients presenting with acute STEMI. Table 2,3

Table 2: Stratification of Modifiable risk factors with age (n=243)

Modifiable Risk Factors		30-50 years	51-60 years	61-70 years	Total	P value
Diabetes Mellitus	Yes	27	30	33	90	0.9937
	No	46	50	57	153	
Total		73	80	90	243	
Hypertension	Yes	50	55	63	168	0.9747
	No	23	25	27	75	
Total		73	80	90	243	
Smoking	Yes	31	35	39	105	0.9868
	No	42	45	51	138	
Total		73	80	90	243	

Table 3: Stratification of Modifiable risk Factors with gender (n=243)

Modifiable Risk Factors		Male	Female	Total	P value
Diabetes Mellitus	Yes	51	39	90	0.8971
	No	88	65	153	
Total		139	104	243	
Hypertension	Yes	96	72	168	0.9778
	No	43	32	75	
Total		139	104	243	
Smoking	Yes	105	0	105	6.1534
	No	34	104	138	
Total		139	104	243	

DISCUSSION

We included 243 patients, of ages varying from 30-70 years, the mean age of whom was 64 years with SD ±10.69. In another study which was conducted in 2013, the mean age of the patients presenting with STEMI was 53 years[13].

There is a quite significant difference in the mean ages of the patients, though both studies were done in the same country, the study was conducted seven years ago. People have become more health conscious and have changed their lifestyle and that is why seven years ago mean age of onset of ST-elevation AMI was 53 years and now has gone to 64 years, showing quite a significant improvement. In our study 139 (57%) patients were males while 104 (43%) patients were females, but the study conducted by Saleh U and Ali SS has shown that males were 81% as compared to only 19% females[13].

This may be because, over time, males have changed their lifestyle, but the sedentary lifestyle of our female population has increased in their proportion. In our study 168(69%) patients had hypertension, which is quite significantly higher than the value of 45% as reported by Saleh U and Ali SS as compared to 70.4% as reported by Adam AM et al[17].

As in 95% of cases of Hypertension, the underlying cause may be familial, so it may be possible that the patients of Saleh U and Ali SS may genetically have higher blood pressure. In our study 105 (43%) patients were smokers, which is very close to the figure of 41% reported by another local study[13] but quite high as compared to the figure of 29.2%, by Adam et al[17].

In our study, Diabetes mellitus was present in 90 (37%) patients, this figure is quite close to a figure of 35% reported by another study[13] but is significantly lower than the figure of 51.2% as reported by Adam AM et al[17]. Cigarette smoking was comparatively more common in males, while hypertension and Diabetes mellitus were more common in females. A study was conducted on 337 female patients only, with a mean age of 53 years ± 8 years, who presented with Acute Coronary Syndrome by Ashraf A et al[18].

History of cigarette smoking was present in 43 (12.7%), while diabetes mellitus was present in 63.7% and hypertension in 76.5% besides other risk factors. One can see that history of cigarette smoking was quite low in the female population of our province as compared to other risk factors.

In a study conducted in another city of the same province of Pakistan by Ahmad et al on 250 adult patients presenting with the acute coronary syndrome (ACS), 161 (64.4%) males and 89 (34.6%) females, the overall frequency of diabetes mellitus was 31.6%, 16.4% males and 15.2% females[19]. Another study from another province of Pakistan which was conducted on 605 patients having ischemic heart disease by Hussain, et al[20] reported the frequency of DM in these patients as 36.85%. The frequency of DM was 16.69% in men and 20.16% in women.

CONCLUSION

The frequency of modifiable risk factors i.e. diabetic mellitus in 37%, hypertension in 69%, and cigarette smoking in 43% in patients presenting with acute ST-elevation myocardial infarction, is quite significant. By having mass public awareness programs at various levels, these risk factors can be reduced and thus the prevalence of ischemic heart diseases can also be reduced.

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CONFLICT OF INTEREST: Authors declare no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE: NIL

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Iqbal S:	Concept, Design, and drafting of initial manuscript
Khan HA:	Acquisition and critical review
Mahmood B:	Analysis and interpretation of data
Iqbal MD:	Data collection, Bibliography, and proofreading

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.