DEMOGRAPHY AND RISK FACTORS IN PATIENTS WITH ACUTE ST ELEVATION MYOCARDIAL INFARCTION UNDERGOING PRIMARY PERCUTANEOUS INTERVENTION IN A TERTIARY CARE CENTER OF PAKISTAN

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ABSTRACT

Objective: To study the demography and risk factors in patients with acute ST elevation myocardial infarction undergoing primary PCI in a tertiary care center of Pakistan.

Study Design: Retrospective cross-sectional study.

Place and Duration of Study: Rawalpindi Institute of Cardiology from Jan 2017 to Dec 2017.

Methodology: All patients diagnosed with acute ST elevation myocardial infarction (STEMI) and selected for primary PCI between Jan 2017 to Dec 2017 were included in the study. The Statistical package for social science SPSS version 11 was used for data analysis. Continuous variables are expressed as mean ± SD. The traditional cardiovascular risk factors (smoking, hypertension, and diabetes mellitus) were noted as percent. The regions of infarction (anterior, inferior and combination) and the left ventricular ejection fraction in percentage were also documented. Descriptive analysis was mainly used.

Results: Total of 818 patients diagnosed with acute ST elevation myocardial infarction (STEMI) and selected for primary PCI between. The mean age was 51.1 ± 11.4 years (range 23-91 years) with staggering 699 (85.5%) patients being male. Majority (31%) of the patients (n=341) were hypertensives and an almost equal percentage 30% (n=331) were chronic smokers. 15% of the patients (n=166) were diabetic and 9% of the patients (n=95) had a strong family history of ischemic heart disease. 7% of the patients (n=77) had dyslipidemia and interestingly 8% of the patients (n=85) were both hypertensives and diabetics.

Conclusion: The potentially modifiable risk factors, especially smoking, had high prevalence in patients with STEMI living in around Rawalpindi district. Similarly uncontrolled hypertension also contributed to acute STEMI in about one third of the patients.

Keywords: Acute ST elevation myocardial infarction (STEMI), Risk factors.

INTRODUCTION

Coronary artery disease is one of the leading causes of morbidity and mortality worldwide which in most cases due to atherosclerotic plaque causing narrowing of the coronary arteries[1]. It can manifest as stable ischemic heart disease or as acute coronary syndrome. Acute coronary syndrome includes unstable angina, non ST elevation myocardial infarction (NSTEMI) and ST elevation myocardial infarction (STEMI). The syndromeis usually characterized by ruptured atherosclerotic plaque with thrombus formation[2]. Acute ST elevation myocardial infarction (STEMI) usually presents with chest pain at rest with elevated ST segments on the ECG and raised cardiac biomarkers released as a result of myocardial injury[3]. Primary percutaneous intervention; either thrombus aspiration or stenting is now the treatment of choice in patients presenting with acute STEMI[4]. There are certain risk factors; modifiable and non-modifiable whose presence increase the risk of having acute ST elevation myocardial infarction. The distribution of non-modifiable risk factors is variable not only in different countries but also in different regions of the same country. This variation is mostly secondary to geographical, genetic and socio-economic factors[5]. Since the incidence of acute STEMI and its subsequent complications can have an impact on the overall disease burden; the recognition of their risk factor

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and their prevention can play an important role in reducing the burden of the disease.

The purpose of the study was to identify the demography and the prevalence of the risk factors of acute ST elevation myocardial infarction in a busy tertiary care center of Pakistan.

METHODOLOGY

This retrospective cross-sectional study was conducted in Rawalpindi Institute of Cardiology. All patients diagnosed with acute ST elevation myocardial infarction (STEMI) and selected for primary PCI between January 2017 to December 2017 were included in the study. The final diagnosis of acute myocardial infarction was based on the presence of the followings criteria: Chest pain typical of coronary artery disease for at least 30 minutes, electrocardiographic evidence of ST elevation myocardial infarction and an increase in serum troponin level to more than two standard deviations above the upper limit of the normal range[3]. The Statistical package for social science SPSS version 11 was used for data analysis. Continuous variables are expressed as mean ± SD. The modifiable cardiovascular risk factors (smoking, hypertension, and diabetes mellitus) were noted as percent. The regions of infarction (anterior, inferior and combination) and the left ventricular ejection fraction in percentage were also documented. Descriptive analysis was mainly used.

Table: Clinical characteristics of patients on admission.

Patient characteristics	n=818
Age	51.1 ± 11.4 years
Sex	699 males (85.5%) 119 female (14.5%)
Type of MI	
Anterior	408 (49.8%)
Inferior	303 (37.1%)
Combination	107 (13.1%)
Culprit artery	
Left main stem (LMS)	4 (0.4%)
Left anterior descending artery (LAD)	427 (52.2%)
Right coronary artery (RCA)	303 (37.1%)
Left circumflex artery (LCX) including Ramus branch	66 (8.1%)
Major diagonal artery	18 (2.2%)
Mean LVEF	35.5%

RESULTS

Total of 818 patients diagnosed with acute ST elevation myocardial infarction (STEMI) and selected for primary PCI between. The mean age was 51.1 ± 11.4 years (range 23-91 years) with staggering 699 (85.5%) patients being male. The clinical characteristics of these patients on admission (table).

The major risk factors are shown in the figure below

Majority of the patients 341 (31%) were hypertensives and an almost equal percentage 331 (30%) were chronic smokers. Fifteen percent of the patients (n=166) were diabetic and 9% of the patients (n=95) had a strong family history of ischemic heart disease. Seven percent of the patients (n=77) had dyslipidemia and interestingly 8% of the patients (n=85) were both hypertensives and diabetics.

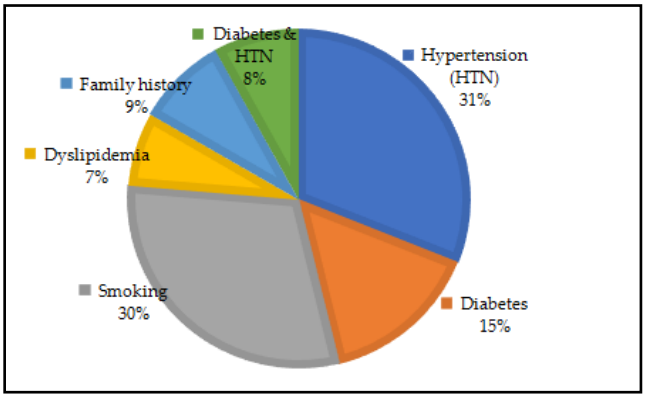

Figure: Risk Factors.

DISCUSSION

The distribution of the common risk factors of coronary artery disease and acute STEMI vary from country to country. Although the disease is more common in the westerncountries[6,7] but is on the rise in Pakistan[12] as well. The main reason for this appears to be the high prevalence of diabetes and hypertension in the country and also due to poor lifestyle mostly in the form of smoking, lack

of activity and poor diet rich in fats and cholesterol.

Hypertension is one of the leading factors contributing to coronary artery disease and hence the subsequent increased morbidity[13] and motrtality[7]. In the worldwide INTERHEART study, the attributable risk for hypertension in causing a STEMI was a staggering 18%[14]. This is in sharp contrast to our study in which approximately one third of the patients (31%)had hypertension and most were diagnosed at the time of the STEMI event. This high percentage appears to be secondary to the lack of screening program for hypertension thus failure of early recognition and prompt management[15].

Cigarette smoking is an avoidable yet a commonrisk factors of acute coronary syndromes. In INTERHEART study, it was reported that smoking leads to an increased risk of having a STEMI event[9]. In addition, the risk of having a STEMI event increased linearly with the number of cigarettes smoked[10]. Cigarette smoking, increasingly becoming a more serious public health problem in our country, was the second most frequently encountered major risk factor in our study population with 30% of patients with acute STEMI being chronic smokers. Similar results were seen in TEKHARF study where 43% of men and 18% of women in Turkish society having a STEMI event were smokers[16].

Interestingly 15% of the patients with acute STEMI in our study were diabetics. This is in contrast to Shah *et al*[12], where 23% of patients with acute STEMI were diagnosed with diabetes mellites. The exact reason for this discrepancy could not be identified but could be due to the geographical variation on the prevalence of diabetes in the country.

MI has also association with genetic and family history. According to one study, certain thrombotic events can be increased by the presence of certain genetic factors thus increasing the risk of having thrombotic occlusion of coronary vessels leading to STEMI[17-18]. In our study 9% of the patients had a close relative with a history of coronary artery disease. This is in contrast to Aygul *et al*[14] where 22% of patients with acute STEMI. Similarly, in Samad *et al*[15] approximately 14% of patients with acute STEMI had family history of coronary artery disease thus precluding to the underlying genetic variation among different races.

LIMITATION OF STUDY

These results were achieved in an experienced interventional single center with a planned program of primary PCI for acute MI patients, and may not be reproducible in all centers. Larger long-term studies are required to determine the clinical value of these results.

CONCLUSION

The present study, which is the first epidemiologic study investigating risk factors for STEMI in Pakistani population in a center that provides a 24 hour service of primary PCI to these patients. It showed that the potentially modifiable risk factors, especially smoking, had high prevalence in patients with STEMI living in around Rawalpindi district. Similarly, uncontrolled hypertension also contributed to acute STEMI in about one third of the patients.

These findings provide an insight to the policy makers to devise a better public health policy focusing on improving the life styles and controlling the modifiable risk factors especially hypertension. In conclusion, modifications in life-styles and a more aggressive management to avoid these risk factors will probably play a strong protective role against most STEMI cases.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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