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Original Article

A prospective study of Myocardial Infarction patients admitted in a tertiary care hospital of south-eastern Rajasthan

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ABSTRACT

Background: There is a paucity of data on the relative importance of various traditional risk factors for coronary artery disease among rural Indians. We conducted a prospective study to determine the risk factors for acute myocardial infarction in a rural population of south-eastern Rajasthan. **Objective:** To access the prevalence and risk factors of myocardial infarction (MI) admitted to S.R.G Hospital, Jhalawar and provide a baseline for deriving effective preventive measures of risk factors for the local community **Method:** Study was conducted in S.R.G. Hospital intensive care unit in Jhalawar Medical College in year 2011 on 112 patients. Criteria for diagnosis of myocardial infarction for all patients were Electrocardiogram (ECG), troponin test, Creatine phosphokinase (CPK) blood level, lipid profile and blood sugar. The Institutional Ethics Committee's approval was obtained before starting the study. Consent was taken from all the patients included. All the data were collected from case record of patients and determined and charted in an excel sheet. Simple frequencies and percentages were obtained for various variables. **Results:** Interpretation of results shows 70% of MI cases were from rural population of Jhalawar; in age group between 40-70 years and most of the patients are laborers and male farmers. Most common risk factor found was smoking and tobacco 55.4% followed by dyslipidemia and hypertension. Location wise most common type of myocardial infarction encountered was anterior wall myocardial infarction (AWMI). **Conclusion:** Observation from our study shows incidence of myocardial infarction is alarmingly high in rural population of Jhalawar because of poor dietary habit, smoking and tobacco chewing.

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1. Introduction

Myocardial infarction is the most common contributor of morbidity and mortality worldwide [1]. In US about 1.1 million cases occur every year with about 30% mortality and more than 50% of deaths occur on way to the hospital. In India, 31.7% of deaths occur due to MI. Incidence of cardiovascular diseases was about 7% in 1970 and increased up to 32% in 2011 in India [2]. The huge burden of CAD in Indian subcontinent is the consequence of large population and high prevalence of cardiovascular risk factors like smoking, alcohol, low fruit and vegetable intake, physical

activity, obesity, high blood pressure and abnormal lipids and diabetes [3]. Diagnostic criteria according to World Health Organization (WHO) should be two of the following three criteria being history of chest pain, ECG changes and changes in cardiac markers like CPK and troponin [4]. With this background, the present study was undertaken among the rural and urban population of Jhalawar in relation of age, gender and category of physical activity. While studying prevalence of CAD and risk factors in S.R.G. hospital, Jhalawar, the opportunity was utilized to increase the awareness of risk factors of the ongoing epidemic of CAD among general public and propagating the preventive measures against the modifiable risk factors like smoking, obesity, control of diabetes, hypertension, dyslipidemia, sedentary lifestyle and faulty dietary habits.

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2. Material and methods

A prospective study was conducted for a period of 1 year from January 2011 to December 2011 in S.R.G. hospital, Jhalawar. Jhalawar is a municipal town having population of about 14 lakhs. All the patients studied were admitted in intensive care unit. After detailed history, physical examination, ECG and biomarkers were done (CPK, troponin test level estimated). Blood sugar and lipid profile was done for all the patients. Inclusion criterion for study was age, gender, physical activity, demographic distribution and risk factors like smoking, tobacco chewing, alcohol, diabetes, hypertension and dyslipidemia. Patients were treated according to their condition. Thrombolysis was done in some of the cases who reached in time and low molecular weight heparin was given and follow-up ECG and blood sugar was done every day. Most of the patients were discharged on the 6th day.

3. Result

Study was conducted on 112 patients consisting of acute ST segment myocardial infarction (STEMI) and NON-ST segment myocardial infarction (NON-STEMI). Demographic characteristics of the patients admitted were given in Table/Fig-1. Out of the total patients of MI, 69.64% were from rural and 30.36% were from urban area. Gender distribution of study shows 70.5% were males and 29.5% were females. Occupation wise percentage of farmers were more (30.4%) followed by labourers and govt. employee. All the patients studied were found to be more than 30 yrs of age. Study revealed 35% of patients were above 50 years and 33% between 40-50 years as shown in Table/Fig-2. Most of the study population scored high with more physical activity and low nutrition diet. Association of risk factors were shown in Table/Fig-3. Most common risk factor found was smoking and tobacco (55.4%) followed by dyslipidemia and hypertension (42.9% and 28.6% respectively). Statistically tobacco and smoking is major cause of MI in laborers and farmers. Location of MI shows that anterior wall myocardial infarction (AWMI) and antero-septal myocardial infarction (ASMI) were more common than the rest as shown in Table/Fig-4. All the patients were treated in ICU. About 35% of patients were given thrombolytics and remaining were treated with low molecular weight heparin. 13 cases died which is about 11.6% mortality Table/Fig-5. Mortality is high for those who came late and were in shock with arrhythmia.

Distribution	Number (N)	Percentage (%)
Rural	78	69.64%
Urban	34	30.36%
Sex		
Male	79	70.5%
Female	33	29.5%
Occupation		
Labourer	31	27.7%
Govt. Employee	28	25%
Farmer	34	30.4%
Non-working	19	17%

Table/Fig-1. Demographic characteristics

Age groups (yrs)	30-40	41-50	51-60	61 & above
Number	10	37	25	40
Percentage (%)	8.9%	33%	22.3%	35.7%

Table/Fig-2. Age distribution of the patient.

Risk factors	Number	Percentage (%)
Smoking & Tobacco	62	55.4%
Alcohol	14	12.5%
Diabetes	14	12.5%
Hypertension	32	28.6%
Dyslipidemia	48	42.9%
None	04	3.6%

Table/Fig-3: Associated risk factors

Location of Infarction	Number	Percentage (%)
IWMI*	28	25%
ASMI**	35	31.3%
AWMI***	39	34.8%
ALMI****	10	8.9%

Table/Fig-4: Location of myocardial infarction

*Inferior wall MI, **Antero-septal MI, ***Anterior wall MI, ****Antero-lateral MI

Total Patients (112)	Gender	
	Male	Female
Cured (99)	598	405
Death (13)		

Table/Fig-5: Mortality rates

4. Discussion

This study shows a high prevalence of multiple life style and metabolic cardio vascular risk factors- physical inactivity, high fat intake, low fruits and vegetables intake, smoking, alcohol, truncal obesity, hypertension, dyslipidemias and the metabolic syndrome in Indian middle class population. Important determinants of risk factors are age, gender, low educational status, high fat in diet and physical activity. This study also shows increasing prevalence of lipid abnormalities (high cholesterol, high triglycerides) in the urban and rural middle class population. Incidence of MI is increasing remarkably both in urban and rural area.

Clustering the various factors, it is evident that study population is between 30-60 years and above. However decline in physical activity with increasing incidence is statistically significant for MI [5,6] but in this study, incidence of MI is about 37.1% in above 50 years of age and incidence is more in laborers and farmers doing more physical activity which is probably because of stress, tobacco chewing, smoking and low nutrition diet. In some studies it is found that relationship of gender and cardiovascular risk factor is almost similar for women at greater

risk of mortality [7]. Men are at a greater risk of heart disease than a premenopausal women. But once past the menopause, a woman's risk is similar to a man's. Risk of MI is similar for men and women. Mortality due to MI is similar in both gender. As observed in the studies, clustering of various cardiovascular risk factors was reported in Asian Indians [8,9,10]. Total serum cholesterol and HDL cholesterol are considered to be important risk factors for CAD in some studies while hypertriglyceridemia with low HDL is reported to be the major risk factor in other studies [11]. In our study, dyslipidemia was present in 43.6% cases. The prevalence of MI with hypertension is reported to be 31.5% in some studies while in this study it is 28.5% [12,13]. Heart disease in patients with diabetes mellitus is different from that in non-diabetics because in this dyslipidemic metabolic syndrome it is the real hidden culprit for cardiac metabolic burden [14-18]. According to the World Health Report 2000, community-based and national campaigns that target major modifiable risk factors may reduce deaths and disability from CAD by nearly half [19]. Most of the deaths from acute MI are due to arrhythmia and shock. In this study mortality is 11.6% and that is because of delay in treatment.

5. Limitations

Our study has certain limitations. First, our sample of Acute MI may not be representative of all patients with the disease because those who were undiagnosed, misdiagnosed, reported late to the hospital or died soon after arrival (or who did not report to the hospital at all) were less likely to be included. Second, we measured glucose and lipid levels only once at the time of admission. Third, CAD may be related to non-traditional risk factors such as C-reactive protein, fibrinogen, lipoprotein (a) and homocysteine. However, the current evidence is insufficient to conclusively support the additive value of these specific risk factors over conventional risk factors.

6. Conclusion

The present study is community based study predominantly in rural population, utilizing well defined criteria including laboratory testing. Therefore these results may reflect the true burden of MI and risk factor in the community at large. The need of the hour would be to increase the awareness of risk factor for MI among general public. Those at risk could be asked to modify their lifestyle, bring out dietary changes and increase in physical activity. The challenge is to develop appropriate strategies to prevent CAD and promote healthy lifestyles in rural communities. If the growing epidemic of CAD is to be reversed, clinicians, healthcare organizations, policy-makers and communities must work together to translate evidence into action.

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