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## Original Research Article

# Evaluate the prevalence of risk factors among patients of myocardial infarction in our population: review of one hundred forty-seven cases

Tirth Bhavsar, Devang Rana\*

Department of Pharmacology, Smt. NHLM Medical College, Ahmedabad, Gujarat, India

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### \*Correspondence:

Dr. Devang Rana,

Email: devangandu@gmail.com

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## ABSTRACT

**Background:** CAD is disease of persons older than 45 years of age. In India, CAD in males, it manifests earlier than west European and North American males. This study is designed to study prevalence of risk factors (and angiographic profiles) amongst patients of Myocardial infarction in our population.

**Methods:** Total of 147 consecutive patients of AMI were studied for risk factors.

**Results:** Out of 147 patients, 116 (79%) were males and 31 (21%) were females. 11 (9.5%) of males and 01 (3.2%) of females were below 40 years of age. Whereas 34 (29.3%) of males and 06 (19.4%) females were of below 50 years of age. Median age for males was 54 years while that for females was 63 years. Smoking remains most prevalent amongst males while high LDL and HT remain most prevalent amongst young and overall females respectively. 108 patients had STEMI while 39 had NSTEMI.

**Conclusions:** AMI occurs much frequently in males. Median age for males is almost one decade earlier than West European males and nearly 5 years earlier than North American males. Smoking is most common and hypertension second most common risk factors amongst males. In females median age for AMI is almost one decade later than Indian males. It is similar to North American females while nearly 5 years earlier than Western Europe females. HT and DM remain first and second common risk factors amongst females.

**Keywords:** Myocardial infarction, CAD, STEMI, DM

## INTRODUCTION

Worldwide, cardiovascular disease is estimated to be the leading cause of death and loss of disability-adjusted life years.<sup>1-4</sup> Rates of cardiovascular death have declined in several developed countries in past decades, rates of cardiovascular disease have risen greatly in low-income and middle-income countries, with about 80% of the burden now occurring from these countries. Effective prevention needs a strategy based on knowledge of prevalence of risk factors for cardiovascular disease in different geographic regions and among various ethnic groups.<sup>4,5</sup> Current knowledge about prevalence of risk

factors and prevention of coronary heart disease and cardiovascular disease is mainly derived from studies done in populations of European origin.<sup>5</sup> These findings cannot be applied worldwide. Some data suggest that risk factors for coronary heart disease vary between populations example, lipids are not associated with this disorder in south Asians and increases in blood pressure might be more important in Chinese people.<sup>6,7</sup> Even if the association of a risk factor with coronary heart disease is similar across populations, prevalence of this factor might vary, resulting in different population attributable risks (PAR)-g, serum cholesterol might be lower in Chinese populations and also, south Asian populations have MI at early age comparative to western population.

## Objectives

Objectives of current study were; to find out prevalence of risk factor and median age of CAD in our population, study is required and to assess these factors, we have carried out study of 147 patients of confirmed MI, at our institute.

## METHODS

One hundred and forty-seven, consecutive patients admitted with confirmed MI between the period of 1 January 2020 to 3 April 2020 at SVP institute of medical science and research, Ahmedabad, Gujarat, India were studied. AMI was defined as either serial rise in cardiac markers/ECG changes indicative of ischemia- ST elevation, depression, development of pathological Q wave, new onset LBBB/echocardiography evidence of new regional wall motion abnormality.

Our proforma includes serial number, age, sex, presenting symptoms, risk factors (namely hypertension, DM, smoking/tobacco, HDL, LDL, total cholesterol, lipoprotein-A homocysteine, obesity, age, sex), STEMI/NSTEMI, ECG (anterior/lateral/inferior wall infarct), echo findings, treatment given and blockage of vessels found on angiography and outcome including morbidity and mortality. Majority of our patients belong to lower and lower middle socio-economical group. Risk factors are defined as abnormal, if, Hypertension (>140/90 mmHg on two occasions), DM (fasting sugar >125 mg%, PPBS >200 mg%), HDL (<40 mg%), LDL (>130 mg%), total cholesterol (>200 mg%), homocysteine (>15 mg% and central obesity; waist circumference more than 102 cm). Angiography >50% stenosis was defined as significant stenosis.

For statistical analysis we have used Medcalc® version 15.0 (Medcalc Software Ltd, Ostend, Belgium).

## RESULTS

Out of total 147 patients studied, 108 had STEMI while 39 had NSTEMI. 116 (%) were male and 31(%) were female. Youngest male was 27 years while youngest female was 40 years aged. Median age for male was 54 years while median age for female was 63 years. Total of 12 patients with 11 males and 1 female was below 40 years of age. Total of 40 patients with 34 males and 6 females were below 50 years of age. Age wise detail is provided in (Table 1).

Overall prevalence of risk factors in descending order was hypertension, smoking, DM, low HDL, high LDL. But overall, in male population risk factor in descending order were smoking, hypertension, low HDL, DM and high LDL. Overall, in female population risk factor in descending order was hypertension, DM, high LDL, Low HDL and high total cholesterol. Below 50 years of age, overall prevalence of risk factor in descending order was smoking, hypertension, high LDL, low HDL and high total cholesterol and specifically for male below 50-smoking, hypertension, high LDL, low HDL and high total cholesterol and for female below 50-high LDL, hypertension and low HDL were in descending order. Detail of risk factor prevalence provided in (Table 2).

**Table 1: Age wise distribution (n=147).**

Age	Male, (N) %	Female (N) %
<b>Total</b>	(116) 79	(31) 21
<b>40 years of age or less (N=12)</b>	(11) 9.5	(01) 3.2
<b>50 years of age or less (N=40)</b>	(34) 85	(06) 15

Mean age of presentation amongst males: smokers was 53 years nearly 5 years earlier then mean age for presentation amongst hypertension (58 years) and dyslipidemia (57 years).

**Table 2: Detail of risk factor prevalence (n=147).**

Parameters	Below 50 years of age (%)			Overall (%)		
	Overall (N=40)	Male (N=34)	Female (N=6)	Overall	Male (N=116)	Female (N=31)
<b>Smoking</b>	40	44	17	34	41.37	6.45
<b>Hypertension</b>	35	35	33	43.5	37	67.74
<b>DM</b>	12.5	12	17	28.6	23.3	48.38
<b>Decrease HDL</b>	27.5	26.5	33.33	27.21	28.44	22.6
<b>Increase LDL</b>	30	26.5	50	19.72	16.38	32.25
<b>Increase total cholesterol</b>	20	20.6	17	13	11.2	19.35
<b>Homocysteine</b>	5	6	00	2.7	3.44	00
<b>Obesity</b>	17.5	20.6	00	11.6	10.34	16.12

Total 52 (38 males+14 females) had 2 or more risk factors at presentation. Total of 25 patients found to have no risk factors detected at presentation. Out of 147, 108 had STEMI while 39 had NSTEMI. Out of total, 92 had

anterior wall Infarct, 39 had inferior wall infarct and 05 had lateral wall infarct. Number of vessels affected-61 had single vessels, 35 had triple vessels and 24 had

double vessels disease. Vessels affected- 98 had LAD, 52 had LCx and 66 patients had RCA involved.

## DISCUSSION

Our study has following principle findings; that coronary artery disease is predominantly seen in male, median age for acute MI in our male population (54 yrs) is one decade younger than our female population (63 yrs) and also almost one decade earlier than western male population. Modifiable risk factors like smoking, hypertension and abnormal lipid level, DM and obesity are in decreasing order of prevalence, with smoking, hypertension and dyslipidemia continued to be most prevalent in males in this part of world. Smoking not only most frequent risk factors amongst males but brought acute MI five years earlier than hypertension. Prevalence of these risk factors may vary with sex and different age. Data emerged from our study are highly consistent with data from INTERHEART multinational study.<sup>8</sup> The implication of these risk factors in causation of CAD and modification of them in reducing CAD complication, are widely studied by others also e.g., blood-pressure lowering, lipid lowering, dietary modification, or persuasive evidence of causality from observational studies, (e.g., smoking cessation).<sup>9-13</sup> Findings of several previous studies—in which these risk factors were measured lend support to our observations. Stamler and colleagues, studied five US cohorts and categorized individuals on the basis of the presence of five factors (abnormal electrocardiogram, diabetes, smoking, cholesterol, and blood pressure).<sup>14</sup> Those without any of these risk factors were judged to be in the low-risk category and had an 80-90% lower risk of coronary heart disease in every cohort compared with the rest of the population. Similar results were also reported in an analysis of the Göteborg population, in which individuals with low blood pressure and a low amount of cholesterol, who were also non-smokers, had an age-adjusted relative risk of 0.09, which was much lower than for than the average population (relative risk 1.0) in the study.<sup>15</sup> Gurm et al have observed that in western population since 2010 prevalence of smoking and dyslipidemia has decreased while prevalence of DM and obesity has increased amongst patients presenting for their first PCI. They have also observed that smokers presenting a decade earlier than non-smokers while non-smokers but obese patients presenting almost 4 years earlier than non-obese patients. They also concluded that smoking and obesity have additive effect.<sup>16,17</sup> Again, from data of our study, smoking, hypertension and abnormal lipid are highly prevalent and DM and obesity next in line as risk factor in our population. Thus, avoiding smoking, reducing blood pressure and lipid lowering dietary/ lifestyle modification, moderate exercise, increasing fruits and vegetables in diet, reducing/ controlling total daily sodium intake, weight loss are of substantial importance in both men and women, at all ages to reduce risk of CAD. It should also be major emphasis in research to

understand why currently known risk factors develop in some individuals and populations, and to identify approaches to prevent their development or reduce them. For example, understanding the mechanisms by which societal factors affect development of risk factors (urbanization, food, and tobacco policies, shifts in occupation from energy expending jobs to sedentary ones, and urban structure, etc) could lead to new approaches to prevent development of risk factors (primordial prevention), which in turn could reduce coronary heart disease substantially.<sup>12</sup> Future challenge in the next few decades will be of discovering more effective ways to substantially alter or prevent development of known risk factors by understanding the societal, environmental, and biological causes of the development of these factors.

## Limitations

Limitation of current study was that the study was done in western India, so in different areas values of prevalence of risk factor can change.

## CONCLUSION

MI in our population is more frequently seen in male. Males in our population are affected by MI almost a decade earlier than male in western population. Males in our population are getting affected by MI almost a decade earlier than females in our population. Smoking, hypertension, abnormal lipid is major risk factor as also DM and obesity. Smokers amongst males presented five years earlier then male patients with other risk factors. Prevention should be instituted early in our population. Smoking is associated with earlier presentation among our male population. Our findings call for continued efforts aimed at preventive and treating smoking, hypertension, and dyslipidemia.

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