

# Comparison of Risk Factors of First Acute Myocardial Infarction in Elderly And Non-Elderly Population: An Institutional Based Three Year Study

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## ABSTRACT

**Background:** The risk factors of Ischemic Heart Disease (IHD) are well known, assessing the distribution of these risk factors in different subgroups of patients can be used for preventive programs. The aim of our study was to differentiate the prevalence of IHD risk factors in elderly and non-elderly patients in their first Acute Myocardial Infarction (AMI).

**Materials & Methods:** In this retrospective study, elderly (age > 65; n = 1000) and non-elderly (age ≤ 65; n = 2000) patients with first AMI who were admitted into our teaching hospitals in Bikaner between 2014 and 2017 were recruited. Risk factors containing male gender, systolic and diastolic hypertension (HTN), diabetes, altered lipid profile smoking and family history of IHD were compared between the two groups.

**Results:** Among different risk factors, diabetes and systolic HTN were more common in elderly than their non-elderly counterparts, and male gender, smoking, family history of IHD and dyslipidemia were more common in non-elderly patients than elderly ones (p < 0.05 for all comparison). Diastolic HTN showed no significant difference between the two groups.

**Conclusion:** Findings of this study, stating difference of prevalence of risk factors in two elderly and non-elderly groups, can be used by health policy makers to conduct preventive programs for AMI in this region as well as country.

**Keywords:** Acute Myocardial Infarction, Risk Factors, Elderly.


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## INTRODUCTION

Ischemic Heart Disease (IHD) is one of the most common causes of death in industry worldwide.<sup>1</sup> In addition; cardiovascular disease is the most common diagnosis in the elderly, and the first cause of death in men and women over 65 years.<sup>2</sup> There are rare or no symptoms of angina in aging and ischemia in the elderly compared with younger patients. Therefore, the symptoms are named "atypical" because the usual symptoms such as substernal pressure and other symptoms do not exist.<sup>2</sup>

Although the risk factors associated with myocardial infarction in men and women are similar, one study has shown stronger association between female gender and diabetes<sup>3</sup>, and the age at IHD is a predictor of death.<sup>2,4</sup>

The existence of traditional risk factors of IHD can result in early myocardial infarction.<sup>5,6</sup> About 90% of IHD occurs in patients who have known risk factors and many studies have confirmed it.<sup>7</sup> The main risk factors of this condition are known, and each risk factor increases the likelihood of IHD through life.<sup>8</sup> It is not clear if the risk factors of IHD are different in elderly and non-elderly people. However, it is known that subclinical IHD is more common in elderly.<sup>7</sup> The aim of this study was to compare the prevalence of risk factors of IHD between elderly and non-elderly patients who

had been admitted to hospital for the first attack of Acute Myocardial Infarction (AMI), in a 3year survey in BIKANER, INDIA. We hope that the results can be used for preparing some information for primary and even secondary prevention to reduce the number and disability of this chronic disease, especially in the elderly.

## PARTICIPANTS AND METHODS

This retrospective study was conducted in teaching hospital in Bikaner, Rajasthan (India) in 2017. Hospital included in this was Haldiram Moolchand Government Center of Cardiovascular Science and Research.

### Participants & Sampling

Participants were all patients who had admitted due to first MI attack in Cardiac Care Unite of our educational hospital and a cardiologist confirmed their diagnosis.

Sampling was done by stratified random sampling method among the admitted patients. Patients were divided into two groups: elderly (age > 65; n = 1000) and non-elderly (age ≤ 65; n = 2000). Socio-demographic, clinical and laboratory data were taken from hospital chart.

**Risk Factors**

We defined systolic HTN as systolic blood pressure  $\geq 140$  mm Hg<sup>10</sup>, diastolic HTN as diastolic blood pressure  $\geq 90$  mm Hg<sup>10</sup>, hypercholesterolemia as cholesterol  $\geq 200$  mg/dl<sup>11</sup>, diabetes as history of known case or Fasting Blood Sugar  $\geq 126$  mg/dl<sup>12</sup>, hypertriglyceridemia as triglyceride  $\geq 150$ <sup>10</sup> and cigarette smoking as daily use of cigarette<sup>13</sup> and positive family history.

**Data Analysis**

Defining the sample size was done by a pilot study. Data were analyzed by SPSS. Data analyzed by chi square. Significant level was considered 0.05.

**RESULTS**

The mean age was  $59.4 \pm 11.75$  years and the range was between 17 and 100. In elderly group, the prevalence of male gender ( $p < 0.001$ ), cigarette smoking ( $p < 0.001$ ), positive family history ( $p < 0.001$ ), hypercholesterolemia ( $p < 0.001$ ) and hypertriglyceridemia ( $p < 0.001$ ) were significantly lower than non-elderly group. The prevalence of systolic HTN ( $p < 0.001$ ) and diabetes mellitus ( $p = 0.004$ ), were higher in the elderly group than non-elderly group. The prevalence of diastolic HTN showed no significant difference in these two groups ( $p > 0.05$ ). Table 1 compares the prevalence of risk factors in the age groups.

**Table 1: Comparison of prevalence of risk factors of first acute MI in elderly and non-elderly people.**

Risk factor	Elderly (>65) n=1000	Non-elderly ( $\leq 65$ )n=2000	P value
Male gender	62.4	78.1	<0.001
Cigarette smoking	32.6	46.5	<0.001
Familiar history of Ischemic Heart Disease	9.5	18.3	<0.001
Hypercholesterolemia	43.0	51.6	0.001
Hypertriglyceridemia	33.2	45.5	<0.001
Systolic hypertension	33.3	24.3	<0.001
Diabetes	43.6	37.6	0.001

**DISCUSSION**

In patients with MI, diabetes and systolic HTN were more common in elderly than non-elderly group ( $p < 0.001$ ), and male gender, smoking; family history and dyslipidemia were less common ( $p < 0.001$ ). The prevalence of diastolic HTN was not different among these age groups. The less important role male gender as a IHD risk factor in elderly people is confirmed in other studies too.<sup>4,9,11</sup> Gender difference of MI is moderated by age, and this is in part due to the weakening the protective effect of estrogen on IHD after menopause.

In addition, smoking had a high prevalence in both groups, about 42% of all patients; it was seen less in elderly group than non-elderly people were. This difference has shown in other studies of IHD were seen less than non-elderly group, too.<sup>13-15</sup> In other countries, this is confirmed.<sup>16-19</sup> That might be associated with other risk factors which can show a familial distribution, such as smoking, life style, dyslipidemia, or genetic similarities among families. Young smokers who have a lower risks, compared with older adults myocardial infarction occurs younger ages.<sup>20,21</sup>

About the lower prevalence of dyslipidemia in elderly group, containing hypercholesterolemia and hypertriglyceridemia, our findings are in line to some other reports.<sup>19,20</sup> Generally, it is believed by some researchers that dyslipidemia might be of more danger for patients younger than 65.<sup>12</sup>

Among those patients admitted because of the first AMI, the prevalence of diabetes is higher in the elderly than non-elderly. Other studies have shown high prevalence of diabetes and its considerable role in AMI at the old age, besides the high mortality rate of IHD/AMI in diabetics in comparison to those without diabetics, the importance of control diabetes in patients with IHD/AMI in elderly is more highlighted.<sup>22,23</sup>

Although, diastolic HTN was similar in both groups, systolic HTN was more common in the elderly group. There are studies however not all of them<sup>2</sup> confirm this finding. As a matter of fact,

since IHD is a multi-factorial condition, and because of a large number of traditional risk factors and the moderating factor of age on their importance, we are encouraged to assess the distribution of and the modifiable IHD risk factors better, especially for each age group. Primary prevention in older people are less represented. Knowledge regarding these modifiable risk factors can be considered essential for primary and even secondary prevention programming. According to this study, it is necessary that for prevention of AMI in elderly, diabetes and systolic HTN should be mostly attended, while it is necessary that smoking and dyslipidemia to be attended more and more in the non-elderly group. These findings can be used for national programs for prevention of AMI and IHD. However any intervention for changing life style in non-elderly, will affect them when they become elderly, and as a general rule, preventive interventions are welcomed for AMI/IHD if they can initiated from the early childhood.

Non-performance or poor performance of health care providers may be due to various recommendations by physicians. Therefore, the specific recommendations for each country may be required

**LIMITATIONS**

We were not able to assess the smoking index. Moreover, metabolic syndrome and high body mass index were not considered. Additionally, control groups for each age group could compare the importance of risk factors in different age groups. In this study, elderly were selected as those with mean age  $> 65$  years.

**CONCLUSION**

Generally, in elderly people systolic HTN and diabetes have been more prevalent, and male gender, smoking, family history of IHD and dyslipidemia are less prevalent than non-elderly group.

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