

## IDENTIFICATION OF RISK FACTORS AMONG MYOCARDIAL INFARCTION PATIENTS ATTENDING DARBHANGA MEDICAL COLLEGE AND HOSPITAL.

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### Abstract

**INTRODUCTION:** Coronary heart diseases (CHD) is the most common serious disease in developed countries and an acute developing health problem in developing countries and have imposed numerous social and economic costs in developed countries. It is known that MI is caused by smoking, which also causes endothelial dysfunction. There are about 80% cases of MI in developing countries but the studies on risk factors are mostly done in countries which are developed. It seems to be important to emphasize on studies on risk factors of MI. The mortality of these diseases are shown to increase in developing countries due to lack of familiarity with risk factors associated to coronary heart diseases and failure to comply with preventive measures.

**MATERIAL AND METHODS:** In this prospective case-control study information was collected on demographic characteristics, history of cardiovascular disease, lifestyle (smoking) and risk factors using structured questionnaire. Critically ill patients with HIV/AIDS or other major diseases like liver failure, kidney failure, etc. were excluded from the study.

**RESULTS:** In present study 118 cases and same number of matched controls were included. It was found that in this study, 97(82.2%) cases had smoking habits whereas 61(51.7%) of controls were smokers. Statistically significant smokers were observed in cases. Among all MI patients, 76(64.4%) had family history of CAD while it was present in 32.2% non-MI patient, difference was statistically significant. A significant proportion of cases (72.3%) had high serum lipid levels compared to controls (43.2%). Among all cases 94(79.7%) were hypertensive and 82(69.5%) controls suffered from hypertension, but the difference was not statistically significant. Prevalence of diabetes among cases 72(61.0%) and controls 68(57.6%) was not statistically significant, although prevalence was high in cases. 5(4.2%) of cases had Coronary artery bypass graf(CABG).

**CONCLUSION:** Most common predictors of MI in our study were smoking, high serum lipid levels, family history of CAD, hypertension and diabetes. Early identification and modification of the risk factors is important for preventing MI.

### Introduction:

Coronary heart diseases (CHD) is the most common serious disease in developed countries and an acute developing health problem in developing countries and have imposed numerous social and economic costs in developed countries. An increasing trend of these diseases is being observed in countries with low or average income which also have the majority of population. Probably these diseases will turn out to be the most common cause for death globally by 2020<sup>i</sup>. Around 1% to 3% of patients in primary healthcare settings experience chest pain<sup>ii, iii</sup>. Among many different causes of chest pain; most of them

are of non-cardiac origin. In about 10–18% of cases, ischemic heart disease(IHD) causes chest pain, of which 2 to 4% are processed to myocardial infarction (MI).<sup>iv, v</sup>

It is known that MI is caused by smoking, which also causes endothelial dysfunction. There are about 80% cases of MI in developing countries but the studies on risk factors are mostly done in countries which are developed. It seems to be important to emphasize on studies on risk factors of MI<sup>vi, vii</sup>.

Studies have identified that diabetes mellitus, hypercholesterolemia, hypertension, obesity, excess alcohol consumption, smoking and sedentary lifestyle

are major risk factors<sup>viii, ix</sup>. Other risk factors can be waist-to-hip ratio, dietary patterns, physical inactivity, blood apolipoproteins, psychosocial factors, loneliness and social isolation and C-reactive protein, uric acid and homocysteine levels as shown in studies by various authors<sup>x</sup>. Certain risk factors are predominant in certain regions as smoking is main determinant of IHD amongst the East Indians of Bangalore, India and populations of certain Arab countries<sup>xi, xii</sup>. It has been reported that East Indians are thought to be at higher risk of CAD by virtue of 'the migrant gene' in a study conducted in Trinidad<sup>xiii</sup>.

The mortality of these diseases are shown to increase in developing countries due to lack of familiarity with risk factors associated to coronary heart diseases and failure to comply with preventive measures. For over 25 years, one of the leading causes of mortality worldwide is Coronary heart disease (CHD)<sup>xiv, xv</sup> and it is estimated that 17% of deaths globally in 2016 were due to CHD<sup>xvi</sup>. This study is aimed to compare association of risk factors among MI patients and non-MI patients.

**MATERIAL AND METHODS:**

This prospective case-control study was conducted at Darbhanga Medical College Laheriasarai Darbhanga in the Dept of General medicine. 118 case patients discharged with diagnosis of MI. 118 age and sex matched non-MI controls were included in the study.

Study personnel gathered information on demographic characteristics, history of cardiovascular disease, lifestyle (smoking) and risk factors using structured questionnaire. Critically ill patients with HIV/AIDS or other major diseases like liver failure, kidney failure, etc. were excluded from the study. Written inform consent from all the participants was obtained in proper format.

Data was entered in Excel 2016. Data was represented in numbers and percentages. Appropriate statistical tests were used to analyze the data. SPSS software was used for statistical calculation. P-value less than 0.05 were considered as significant.

**OBSERVATION AND RESULTS:**

In present study 118 cases and same number of matched controls were included. Least age of respondent in present study was 33 years and maximum age was 81 years.

**Table 1: Demographic data**

Age – group	Cases [n (%)]	Controls [n (%)]	p – value
Less than 40	6(5.1%)	4(3.4%)	0.5157
40 – 50	26(22.0%)	29(24.6%)	0.6455
50 – 60	37(31.4%)	35(29.7%)	0.7794
60 – 70	34(28.8%)	32(27.1%)	0.7718
70 and above	15(12.7%)	18(15.2%)	0.5754
<b>Gender</b>			
Male	71(60.1%)	74(62.7%)	0.6891
Female	47(39.9%)	44(37.3%)	0.5892

In present study it is observed that majority if MI cases belonged to age group 40 to 70 years. No statistically significant difference has been observed between proportion of MI cases and non-MI controls across age groups as well as in males and females.

**Table 2: Lifestyle and risk factors**

Risk factors	Cases [n (%)]	Controls [n (%)]	p – value
Smoking	97(82.2%)	61(51.7%)	<0.00001
Family history	76(64.4%)	38(32.2%)	<0.00001
High serum lipid levels	86(72.3%)	51(43.2%)	<0.00001
Hypertension	94(79.7%)	82(69.5%)	0.0734
Diabetes	72(61.0%)	68(57.6%)	0.5961
CABG	5(4.2%)	0(0%)	0.0238

In present study, 97(82.2%) cases had smoking habits whereas 61(51.7%) of controls were smokers. Statistically significant smokers were observed in cases. Among all MI patients, 76(64.4%) had family history of CAD while it was present in 32.2% non-MI patient, difference was statistically significant. A significant proportion of cases (72.3%) had high serum lipid levels compared to controls (43.2%). Among all cases 94(79.7%) were hypertensive and 82(69.5%) controls suffered from hypertension, but the difference was not statistically significant. Prevalence of diabetes among cases 72(61.0%) and controls 68(57.6%) was not statistically significant, although prevalence was high in cases. 5(4.2%) of cases had Coronary artery bypass graft (CABG).

**Table 4: Association of risk factors between cases and controls**

Risk factors	Cases [n(%)]	Controls [n(%)]	Chi-square value	p – value
Smoking	97(82.2%)	61(51.7%)	24.81	<0.00001
CAD history	76(64.4%)	38(32.2%)	24.50	<0.00001
High serum lipid levels	86(72.3%)	51(43.2%)	21.31	<0.00001
Hypertension	94(79.7%)	82(69.5%)	3.21	0.0728
Diabetes	72(61.0%)	68(57.6%)	0.28	0.5960
CABG	5(4.2%)	0(0%)	0.0599	<0.05

It is observed in present study that smoking, CAD history, high serum lipid levels and CABG are associated with MI patients, whereas hypertension and diabetes, though prevalent among cases are not associated with MI.

#### DISCUSSION:

In present study total of 236 patients were included among which 118 were cases with MI and 118 were non-MI controls. In our study, 97(82.2%) cases had smoking habits whereas 61(51.7%) of controls were smokers. Statistically significant smokers were observed in cases. Studies conducted in developed countries have shown smoking of tobacco to be major risk factor for IHD<sup>xvii</sup>. In another study, it was observed that cigarette smoking causes significant inhibition of substance P-induced tissue plasminogen activator which is released *in vivo* and this causes endothelial dysfunction which may increase the risk of atherothrombosis through a reduction in the acute fibrinolytic capacity<sup>6</sup>. Though some studies have deliberated on the prevalence of coronary artery disease in Asian Indians, the importance of smoking as a risk factor has not been considered in them<sup>xviii</sup>.

In a study conducted in Libya, history of CAD, smoking, diabetes and hypertension were found to be the most common cardiovascular risk factors<sup>xix</sup> where as in another study conducted among young patients in Pakistan, it was noted that history of CAD and smoking were common risk factors<sup>xx</sup>.

Among all MI patients in our study, 76(64.4%) had family history of CAD while it was present in 32.2% non-MI patient, difference was statistically significant. A significant proportion of cases (72.3%) had high serum lipid levels compared to controls (43.2%). Among all cases 94(79.7%) were hypertensive and 82(69.5%) controls suffered from hypertension, but the difference was not statistically significant. Prevalence of diabetes among cases 72(61.0%) and controls 68(57.6%) was not statistically significant. Risk factors such as smoking, coronary artery disease history, high serum lipid levels and CABG were associated with MI.

In a study by Bahall, M et. al<sup>10</sup>, the predictors for AMI were smoking [Odds Ratio (OR): 0.274,  $p \leq 0.001$ ], stressful life [OR: 2.697,  $p \leq 0.001$ ], diabetes [OR: 0.530,  $p = 0.020$ ], hypertension [OR: 0.48,  $p = 0.10$ ] and IHD [OR: 0.111,  $p \leq 0.001$ ]. Wilson et al. showed similar predictors diabetes, hypertension, and IHD of AMI,<sup>xxi</sup>

In a study by NaL et.al hypercholesterolemia is a cause of concern as it is related to dietary patterns and type of food consumption<sup>xxii</sup>. Kawano et al. found that hypercholesterolaemia is an independent risk factor for MI in men but not in women<sup>xxiii</sup>. Mungrue K et.al reported that smoking was associated with a 1.6-times higher risk for Acute MI and BMI with a 1.3-times higher risk<sup>xxiv</sup>

#### CONCLUSION:

The predictors of MI observed were smoking, high serum lipid levels, family history of CAD, hypertension and diabetes. Early identification and modification of the risk factors may help in preventing MI. Attention is to be paid to smoking.

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