Association of Environmental Risk Factors with Myocardial Infarction

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ABSTRACT The term coronary heart disease (CHD) is a disease spectrum caused due to imbalance between myocardial oxygen supply and demand. The symptomatic coronary heart disease may manifest as angina pectoris, myocardial infarction and sudden death. The most common symptoms among the patients of myocardial infarction are the heavy squeezing and crushing pain. There are various factors, which singly and in combination, conspire to cause myocardial infarction. The present investigation examines the association of environmental factors like physical activity, smoking and alcohol intake with myocardial infarction through case-control study. Analysis of data reveals that subjects who smoke and have sedentary life style are more likely to develop myocardial infarction.

INTRODUCTION

The term coronary heart disease (CHD) is a disease spectrum of diverse aetiology caused due to the imbalance between myocardial oxygen supply and demand. The symptomatic coronary heart disease may manifest as angina pectoris, myocardial infarction and sudden death. Heavy squeezing and crushing pain are the most common symptoms among the patients of myocardial infarction. It is severe, though similar in character with angina pectoris; rest doesn’t relieve it and it lasts longer. It involves the central portion of the chest and/or epigastrium typically, and radiates to arms in 30 per cent of cases. 15 to 20 per cent of myocardial infarction are painless, such incidence being greater in patients having diabetes mellitus. There are various factors, which singly, and in combination, conspire to cause coronary heart disease. The following are some of the risk factors:

Tobacco Smoking

There are such abundant evidences to conclude that tobacco smoking is a major risk contributor in the causation of coronary disease (WHO, 1979; Rosenberg et al., 1985; Shewry et al., 1990; Benfante et al., 1991). After excluding the deaths due to infectious disease, 80 per cent of deaths in men under the age of 45 years can be attributed directly to tobacco. Nicotine stimulates secretion of adrenaline like chemical, which constricts the small blood vessels, increases blood pressure, heart rate and increases workload and oxygen demand of the heart. It raises cholesterol and increase tendency of blood to clot more easily.

Cumulative effect leads to and aggravates atherosclerosis of coronary arteries, which is responsible for angina and heart attacks.

Physical Activity

Exercise makes an important contribution to health and sense of well being is universally recognised fact. Incidence of fatal and non-fatal cardiovascular disease, has a strong inverse relationship with exercise (Paffenbarger et al., 1986; Caspersen et al., 1989; Keys et al., 1990; Laws et al., 1990). The mortality rates were significantly lower among the physically active with or without consideration of cigarette smoking, systemic hypertension, gain in body weight or early parental death. Findings of a few prospective studies on female subjects have paralleled findings in men.

Alcohol Intake and Coronary Heart Disease

Epidemiological studies have consistently shown an apparent protective association between light and moderate alcohol consumption and coronary heart disease (Marmot, 1984; Friedman et al., 1986; Moore and Person, 1986; Narlawar, et al., 1989; Rimm et al., 1991; Jackson et al., 1991; Maclure, 1993). Despite the consistency of the findings, some have argued that the association may be due, at least
partly to the use of a reference group of non-drinkers which may include heavy drinkers who
deny their alcohol intake or people who have
stopped drinking because of illness (Shaper,
1990; Criqui, 1990). Although alcohol consump-
tion varies with dietary habits, dietary intake has
been considered in only a few studies of alcohol
intake and coronary heart disease (Thomson et
al., 1988). High alcohol intake is associated with
excess risk of CHD, hypertension and many
other physical, mental and social problems.

The present study investigates the associa-
tion of physical activity, smoking and alcohol
intake with myocardial infarction through case-
control study.

MATERIAL AND METHODS

Freshly diagnosed 200 patients of coronary
heart disease especially with myocardial
infarction having ECG changes, belonging to
different areas of Delhi admitted in the coronary
care unit of Lok Nayak Jai Parkash Hospital,
Delhi, were selected. An equal number of con-
trols who were free from the coronary heart dis-
ease were matched for age, sex and religion and
were selected from different wards of the same
hospital.

Subjects who were smoking 5 cigarettes per
day for a period of more than 2 years were called
smokers. Physical activity was classified as
dentary and moderate/or heavy according to
the physical activity and type of job of the sub-
jects. Subjects who were drinking more than 75
ml alcohol daily were classified as regular alco-
holics and those who were drinking occasional-
ly were classified as having irregular alcohol
intake.

RESULTS AND DISCUSSION

In the present study males constitute 84.5 per
cent of the total myocardial infarction (MI) cases
while females constitute only 15.5 per cent of
the total cases. The frequency of coronary heart
disease (CHD) increased with age and was higher
in males in all the age groups. The highest per-
centage of MI was found to be in the age group
of 51-55 years.

Table 1 shows the distribution of smoking
habit among cases and controls. 48 per cent of
the cases were smokers as compared to 22 per
cent in the controls. The Comparison between
cases and control showed smoking as a signifi-
cant risk factor for the coronary heart disease
($\chi^2 = 29.71, d.f. = 1, P<0.05$). The relative
risk was found to be 3.27 indicating that smokers had
3.27 times the risk of developing CHD as com-
pared to non-smokers. There were no female
smokers in cases or control group.

| Table 1: Distribution of smoking habit among cases and controls |
|------------------|------------------|------------------|
|                  | Cases            | Control          |
|                  | Smoker Non       | Total            |
|                  | smoker           |                  |
| 96               | (48.0)           | 200 (100.0)      |
| 104              | (52.0)           | 200 (100.0)      |
| 44               | (22.0)           | 156 (78.0)       |
| 156              | (78.0)           | 200 (100.0)      |

Figures in parenthesis denotes percentage.
$\chi^2 = 29.71$ d.f. = 1, P<0.05 RR = 3.27

Table 2 shows the distribution of physical
activity among cases and control. 81 per cent of
cases had sedentary habits as compared to 73.5
per cent of control. The comparison between
cases and controls with respect to physical ac-
activity was found to be statistically not signif-
cant ($\chi^2 = 3.20, d.f. = 1, P>0.05$). The relative
risk between cases and controls with respect to
physical activity was found to be 1.6 indicating
that patient with sedentary habits were more
likely to develop coronary heart disease as com-
pared to patients with physical activity.

| Table 2: Distribution of physical activity among cases and controls |
|------------------|------------------|------------------|
|                  | Cases            | Control          |
|                  | Sedentary Moderate or Heavy Total | Sedentary Moderate or Heavy Total |
| 162              | (81.0)           | 200 (100.0)      |
| 38               | (19.0)           | 147 (73.5)       |
| 147              | (73.5)           | 53 (26.5)        |
| 53               | (26.5)           | 200 (100.0)      |

Figures in parenthesis denotes percentage.
$\chi^2 = 3.20$ d.f. = 1, P>0.05 RR = 1.6

Table 3 shows the distribution of alcohol in-
take among cases and controls. 9.5 per cent of
the cases were consuming alcohol regularly as
compared to 11 per cent in controls. The com-
parison between cases and controls with respects
to alcohol intake was found to be statistically

$\chi^2 = 3.20$ d.f. = 1, P>0.05 RR = 1.6
Table 3: Distribution of alcohol intake among cases and controls

<table>
<thead>
<tr>
<th>Cases</th>
<th>Non alcoholic</th>
<th>Regular intake</th>
<th>Irregular intake</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>166 (83.0)</td>
<td>19 (9.5)</td>
<td>15 (7.5)</td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control</th>
<th>Non alcoholic</th>
<th>Regular intake</th>
<th>Irregular intake</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>175 (87.5)</td>
<td>22 (11.0)</td>
<td>3 (1.5)</td>
<td>200</td>
</tr>
</tbody>
</table>

Figures in parenthesis denotes percentage.
$\chi^2 = 1.61$ d.f. = 1, $P > 0.05$ RR = 0.9

non-significant. The present study reveals that subjects who smoke and have sedentary life style are more likely to develop coronary heart disease. Smoking however, is traced out to be a significant risk factor in myocardial infarction.

REFERENCES


