



Research Paper

Case Control Study of Lifestyle and Behavioral Risk Factors of Coronary Artery Disease in Tertiary Care Hospital

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Abstract

In India 53% of all deaths was due to non-communicable diseases and 28% deaths were due to cardiovascular diseases like coronary artery disease (CAD). This epidemic of non-communicable diseases is due to steep rise of lifestyle risk factors. The purpose of study was not to find out new risk factors but to study behavioural risk factors in local community for CAD. Present case control study was carried out at tertiary care hospital. Newly-diagnosed 51 cases of coronary artery disease and 51 age and gender matched controls were studied. We studied the risk factors for CAD like obesity, tobacco chewing and smoking, alcohol consumption, psychological stress, physical inactivity. Data was analysed by using Graph pad prism software, Chi square test, Z test and Odds ratio was calculated. We found strong significant association of tobacco chewing, tobacco smoking and psychological stress with CAD. We found no significant association of alcohol consumption and BMI with CAD in our study. We conclude that modifiable risk factors are strongly associated with the coronary artery disease. Therefore intense attention should be paid to the behavioural risk factors for prevention of coronary artery disease and people should be encouraged to avoid risky and unhealthy behaviours.

Keywords: coronary artery disease (CAD), behavioural risk factors, etc.

Introduction

A rapid demographic as well as epidemiological transition is undergoing in India. In India 53% of all deaths were due to non-communicable diseases and 28% deaths were due to cardiovascular diseases like coronary artery disease (CAD).¹ The disease burden has shifted from communicable diseases to non-communicable diseases. Cardio-

vascular diseases, COPD, cancer and accidental injuries are four major diseases leading to this mortality.²

In Indians 11.7% of heart attacks occur in less than 40 years of age as compared to 5.6% in rest of the world.³ Last two decades studies have demonstrated that non-communicable diseases epidemic is not only confined to the rich but it is

equally common in poor and uneducated Indian population.⁴ This increasing epidemic of non-communicable diseases is due to steep rise of lifestyle risk factors and adoption of risky and unhealthy behaviours.^{1,5}

CAD is one of the most and best studied disease entities and several hundred risk factors have been identified. The purpose of study was not to find out new risk factors but to study behavioural risk factors in local community for CAD which leads to mortality and morbidity.

We studied the risk factors for CAD like obesity, tobacco smoking, alcohol consumption, tobacco chewing, psychological stress and physical inactivity in CAD patient group and age, gender matched controls. This could help to recommend suitable and effective measures to reduce morbidity and mortality due to CAD.

Materials & Methods

This case control study was done during December 2014 to March 2015.

Study Population

Cases: Successive patients with newly diagnosed acute coronary event (acute myocardial infarction or non-ST elevation myocardial infarction or unstable angina) presenting to Inlaks & Budhrani Hospital, Pune were enrolled as cases after taking written informed consent.

1. Acute myocardial infarction was diagnosed if patients fulfilled 2 of 3 criteria: typical chest pain, ECG changes and raised serum concentrations of cardiac biomarkers,
2. Non-ST elevation myocardial infarction was diagnosed if patient with chest pain develop ECG changes like unstable angina and positive cardiac biomarkers,
3. Unstable angina was diagnosed if patient with chest pain develop ECG change of fresh ST segment depression, transient ST segment elevation and/or T wave inversion.

Control: Controls were randomly selected age and gender matched individuals from general health check department and wards of Inlaks and Budhrani hospital that were free from

cardiovascular disease and informed written consent taken. We obtained 12 lead ECG in all controls and excluded those with abnormal ECG. We excluded subjects with history of acute myocardial infarction or angina pectoris.

Matching

For each case, 1 age and gender matched control was selected; age matching was done with the liability of ± 5 years of age.

Sample Size

Total 102 subjects, 51 cases studied within period of three months and 51 age and gender matched controls from health department and wards.

Data Collection

We collected information regarding demographic data, family history and history of major illnesses such as coronary heart disease, hypertension, diabetes, stroke, smoking or tobacco intake. Physical activity was assessed according to occupation and physical exercise taken daily into sedentary and non-sedentary. General Physical examination was performed to assess height, weight, and blood pressure.

Definition of Risk Factors

1. Smoking: All present and past smokers have been included in smoker's category. A division of subjects into 2 classes: smokers and non-smokers. Tobacco chewing is categorized separately.
2. Alcohol Intake: All present and past alcohol drinkers have been included in drinker's category. Those who drink /drank more than 3 times per week or daily as drinkers
3. Psychological Stress: Once patient get stabilized psychological stress risk factors interviewed as per Homes & Rahe's Stress Scale⁶ and data entered into HRSS proforma. Subjects were classified into high, moderate and no risk category as per scores of 300 +, 299-150, <150 respectively.
4. Physical Activity: Depending upon the nature of occupation and considering time spend for moderate physical activity like brisk walking, cycling calculated for each subject, they were classified as sedentary if physical activity was <30 minutes/day.

Sedentary group includes professional men like Engineers, Clerks, Teachers, Business Executives, and Industrialists etc. Out of these, those patients who were taking regular exercise were excluded. Non sedentary group mainly engaged with manual work, skilled and unskilled workers and those patients from above group who take daily exercise.

6. Obesity: Height and weight were measured and BMI was calculated as weight in kilograms divided by square of the height in meters.

Statistical Analysis

Statistical analysis was done by using graph pad prism software. Association of the risk factors under study was assessed by applying Chi-Square test .To assess the strength of association, the odds ratio was calculated. For the purpose of study P < 0.05 was considered statistically significant.

Table 1: Demographic profile comparison of case and control groups

| Parameters | Cases Group | Control Group | z-value | p-value |
|---------------|-------------|---------------|---------|---------|
| Weight(kg) | 66.40±12.18 | 69.26±14.82 | 2.74 | <0.05* |
| Height(Metre) | 1.62±0.11 | 1.62±0.09 | 0.543 | >0.05 |
| BMI(Kg/m2) | 25.44±4.49 | 26.19±4.77 | 0.521 | >0.05 |

Table 2: Distribution of patients according to addictions

| Addictions | Case Group (n=51) | Control Group (n=51) | χ ² -value | p-value | Odd's Ratio |
|---------------------|-------------------|----------------------|-----------------------|---------------------|---------------------------|
| Tobacco chewer | 14(27.45%) | 6(11.77%) | 3.98 | P=0.046 p<0.05* | 2.84 (0.99-8.11) |
| Nontobacco chewer | 37(72.55%) | 45(88.23%) | | | |
| Smoker | 23 (45.09%) | 9 (17.64%) | 8.925 | P=0.0028 P<0.05* | 3.833 (1.547 -9.496) |
| Non smoker | 28 (54.90%) | 42 (82.35%) | | | |
| Alcohol drinker | 16(31.37 %) | 11(21.56%) | 0.54 | P= 0.2618 p>0.05 | 1.662 (0.6813 - 4.056) |
| Non-alcohol drinker | 35 (68.62%) | 40(78.43%) | | | |

Table 3: Distribution of patients according to physical activity

| Physical activity | Case Group (n=51) | Control Group (n=51) | χ ² -value | p-value | Odd's Ratio |
|-------------------|-------------------|----------------------|-----------------------|------------------|---------------------|
| Sedentary | 38(74.51%) | 33(64.71%) | 1.16 | P=0.28 p>0.05 | 1.59 (0.68-3.74) |
| Non Sedentary | 13(25.49%) | 18(35.29%) | | | |
| Total | 51(100%) | 51(100%) | | | |

Table 4: Psychological Stress in both the groups

| Stress | Case Group (n=51) | Control Group (n=51) | χ ² -value | p-value |
|----------|-------------------|----------------------|-----------------------|-----------|
| High | 5(9.80%) | 2(3.92%) | 35.67 | <0.00001* |
| Moderate | 42(82.35%) | 16(31.37%) | | |
| No | 4(7.85%) | 33(64.71%) | | |
| Total | 51(100%) | 51(100%) | | |

Discussion

The purpose of this study was not to find out new risk factors but to study behavioural risk factors in local community for CAD which is leading cause of morbidity and mortality. In the present study we found significant association of tobacco chewing as well as tobacco smoking to CAD. There are certain evidences that any form of

tobacco either tobacco chewing or smoking is major risk factor for CAD.⁷ Results of our study suggest that tobacco chewing as well as smoking cessation should be given paramount importance in prevention of CAD in the society. We found alcohol consumption was not significantly associated with CAD. Many studies had described the fact that mild to moderate alcohol

consumption have lowest rate of coronary heart disease and excessive users having higher rate.⁸ Physical inactivity is associated with an increased risk of heart disease generally.⁹In contrast; our study did not found any difference between two groups. It may be because of overall increase in physical inactivity in both groups of our study.

We found significant association of psychological stress with CAD. Emotional triggers cause neurohormonal activation which leads to systemic vasoconstriction, increase in heart rate and blood pressure, and decrease in heart rate variability.¹⁰ Increased heart rate and blood pressure lead to increased myocardial work and myocardial oxygen consumption and decreased heart rate variability is a known risk factor for cardiovascular morbidity and mortality.¹¹

From our results we can conclude that there is strong significant association of tobacco chewing, tobacco smoking and psychological stress with CAD. Therefore intense attention should be paid to the behavioural risk factors for prevention of coronary artery disease. Public awareness should be done regarding increasing epidemic of non-communicable diseases and they should be encouraged to avoid risky and unhealthy behaviours.

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