



Research Article

PREVALENCE OF CARDIOVASCULAR DISEASE AND ITS RISK FACTORS IN KERALA

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ABSTRACT

**Introduction:** Coronary artery disease (CAD) is a major health issue in developing nations. Kerala has a significant number of people at risk as heart disease has a large number of predisposing and rampant etiological factors, many of which are controllable. **Aims and Objectives:** To study the prevalence of risk factors and their association with coronary artery disease, a cross sectional community based study was conducted in Tholur Panchayat of Thrissur, Kerala, among adults over 25 years of age. **Methodology:** Information on socio-demographics, education, occupation, monthly income, personal history of hypertension, diabetes, dyslipidemia, coronary artery disease and family history of heart disease was collected using a structured interview schedule. The data was entered in Microsoft Excel and analyzed using Epi-info. **Result:** The prevalence of cardiovascular disease was 9.5% and among them 17.6% were males and 4.8% of them were females. Education and occupation, family history of heart disease, other co - morbidities like diabetes, hypertension and dyslipidemia play their own roles in the development of heart disease. **Conclusion:** The prevalence of coronary artery disease correlates with significant controllable risk factors like diabetes mellitus, hypertension and dyslipidemia. So early detection and proper treatment of these co-morbidities before developing end organ damage play a vital role in the prevention of coronary artery disease.

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INTRODUCTION

Cardiovascular disease, one of the non-communicable diseases, has become a major health issue in developing nations. Indians are more prone as a community to CAD at a much younger age. Indians also show a higher incidence of hospitalisation, morbidity and mortality than other ethnic groups. The post-infarction course is also worse in Indians as compared to whites. This is reflected by three times higher rate of re-infarction and two times higher rate of mortality<sup>1,2,3</sup>.

Kerala, with a population of over 33 million, is the most advanced state in epidemiological transition and has the highest prevalence of CAD risk factors in India<sup>4</sup>. The health status in Kerala is much more different from that of other states in India owing to its 100% literacy, better distribution of healthcare manpower among rural and urban areas and increased healthcare institutions in Kerala. There is a need for identifying and correcting the conventional risk factors. Male sex is more prone to CAD but post-menopausal females need special attention as they constitute a distinct sub-group at a high risk for CAD. The risk factors are modifiable and non-modifiable. The non-modifiable factors are age, sex, family history and genetic factors. The modifiable ones are cigarette smoking, hypertension, elevated serum cholesterol, diabetes, obesity and a sedentary lifestyle.

Due to urbanization there is an increased prevalence of cardiovascular risk factors in India. Urbanization which is characterized by a decrease in physical activity, increase in the intake of energy dense foods, higher consumption of saturated fats, calories, salt, increased level of psychosocial stress, addictions like smoking and chewing tobacco along with alcohol intake play their own roles. Hypertension remains a standard risk factor associated with CAD. In contrast to the decreasing mean cholesterol levels in the USA, the mean serum cholesterol level in urban Indians is rising. Smoking increases the risk of CAD by 3-5 times. Central obesity, depicted by waist to hip ratio is an independent risk factor for CAD; even a modest increase in body fat with central distribution increases the risk further<sup>5</sup>. Among adults above 20 years of age, there has been a two-fold rise in CAD in rural areas and a six-fold rise in urban areas during the period from 1960 to 2002<sup>6</sup>.

The study was conducted with the following objectives

1. To study the prevalence of risk factors of coronary heart disease among people above 25 years in Tholur Panchayat of Thrissur, Kerala.
2. To assess the association of social risk factors to coronary heart disease among adults over 25 years of age in Tholur Panchayat of Thrissur, Kerala.

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## MATERIALS AND METHODS

A cross-sectional study was conducted among adults above 25 years of age in Tholur Panchayat, Wards 11 and 12, Thrissur. The community based prevalence study had a sample size of 232 (> 25 years). A house to house survey was done and the data collection method was a personal interview after obtaining informed consent using a pre-tested questionnaire. 107 houses were surveyed. The study was conducted from 21/02/2019 to 24/02/2019 (3 days). The questionnaire, a weighing machine, a sphygmomanometer, a stethoscope and a measuring tape were the materials used to aid in medical examination and to obtain anthropometric measurements.

Statistical analysis was done by Epi info software. The data was tabulated using frequency distribution tables and proportion. Association between the prevalence of CAD and its risk factors was examined using the Chi-square test. A p value less than 0.05 was taken as statistically significant.

## OBSERVATIONS AND RESULTS

**Table 1** Prevalence of risk factors of CHD

Parameters	Frequency	Percentage
History of CHD	22	9.5
Family history of CHD	36	15.5
History of DM	48	20.8
History of hypertension	58	25.6
History of dyslipidemia	27	11.6

**Table 2** Association between socio-demographic factors and CHD

AGE	Frequency	Total	Chi-square	P value
25-34	0 (0%)	56	28.10	0
35-44	0 (0%)	41		
45-54	6 (9.8%)	61		
55-64	6 (14.6%)	41		
>64	10 (30.3%)	33		
GENDER	Frequency	Total	10.4	0.001
Female	7(4.8%)	147		
Male	15(17.6%)	85		
Total	22	232		

**Table 3** Association between education and CHD

Education	Frequency	Total	Chi-square	P value
Illiterate	5(31.2%)	16	13.3957	0.0372
Primary	6(12.2%)	49		
Secondary	7(8.2%)	85		
Higher secondary	3(7.3%)	41		
University	0	33		
Professional	1(14.3%)	7		
Others	0	1		

**Table 4** Association of occupation and monthly income with CHD

Occupation	Frequency	Total	Chi-square	P value
Unskilled	3(20%)	15	21.5794	0.003
Semiskilled	1(4.2%)	24		
Skilled	1(3%)	33		
Professional	1(12.5%)	8		
Business	2(16.7%)	12		
Housewife	5(4.9%)	102		
None	4(16%)	25		
Others	5(38.5%)	13		
Monthly Income	Frequency	Total	3.5042	0.477

<1000	5(12.8%)	39
1001-2000	2(4.5%)	44
2001-5000	5(11.1%)	45
5001-10,000	4(6.6%)	61
>10,000	6(14%)	43

Among the surveyed individuals 9.5% of the population has a history of CAD. Of these 15.5% have a family history of heart disease. In this study population, 20.8% of the people have diabetes mellitus, 25.6% have hypertension and 11.6% have dyslipidemia. The association between age, gender and CAD is statistically significant. People above the age of 64 have the highest prevalence of CAD. Regarding the gender association of CAD, the disease seems to affect male population (17.6%) than females (4.8%). The association between education and CAD is statistically significant. 12.2% of the people having secondary education alone reported the highest prevalence of CAD.

The association between occupation and CAD is statistically significant. The highest prevalence was seen among other jobs not included in our questionnaire (38.5%). The association between monthly income and CAD is not statistically significant. Highest prevalence was seen in those earning more than 10,000 per month (14%) followed by those earning less than 1000 per month (12.8%). In this study, people above the age of 64 have the highest prevalence of CAD. Compared with other populations around the world, CAD occurs in Indians 5 to 10 years earlier and the major effect of this peculiar phenomenon is on the productive workforce of the country aged 35-65 years<sup>7</sup>.

## DISCUSSION

In our study, the association between age, gender and CAD is statistically significant. Previous studies from other part of India have highlighted the marked urban preponderance of CAD<sup>8,9,10</sup>. It is seen that CAD occurs in Indians 5 to 10 years earlier<sup>11,12</sup>. US statistics reported the prevalence of CAD as 6.4% in adults more than 20 years of age. The prevalence of CAD was 7.9% for men and 5.1% for women<sup>13</sup>. The figures in US data may be due to differences in age, sample, survey methods and criteria for diagnosis. Indians are genetically more prone to develop type 2 diabetes due to insulin resistance<sup>14</sup>. A moderate increase in body fat with central distribution has been shown to increase the risk of CAD.

In the current study, among the surveyed individuals, 9.5% of the population has a history of CAD. Of these 15.5% have a family history of heart disease. Jain *et al* has shown that a family history of premature CAD in first degree relatives is associated with development of CAD<sup>15</sup>. Enas *et al* have shown that Indian migrants to Western status have a high prevalence of dyslipidemia and insulin resistance thereby increasing the risk for CAD<sup>16,17</sup>.

## CONCLUSION

According to our study, the contributing risk factors are: diabetes, hypertension, hypercholesterolemia, genetic factors, physical inactivity, habituations and dietary habits. The etiology of CAD is multi-factorial. As the number of risk factors increases, more likely is the chance of developing CAD. There is a strong positive correlation of increase in cardiovascular disease in rural subjects with primordial risk factors of faulty diet, tobacco consumption and sedentary

lifestyle. Major coronary risk factors - high blood pressure, high cholesterol levels, low HDL cholesterol, insulin resistance and diabetes are also escalating in these populations and correlate positively with the increase in coronary disease. There is an urgent need to develop cardiovascular disease risk factor surveillance systems in Indian rural populations.

### Recommendations

The following measures can drastically reduce the burden of CHD on the society; reduction of fat intake to 20-30% of total energy intake, consumption of saturated fats must be limited to <10% of total energy intake, reduction of dietary cholesterol to below 100mg per day, increasing complex carbohydrate consumption (vegetables, fruits, whole grains and legumes). Reduced salt intake, avoidance of high alcohol intake and smoking are also beneficial. Effective information and educational activities on the need for weight control should be organized regularly. Regular physical activity should be a part of daily life.

### Contribution by Authors

Sreelakshmi K conducted the research, collected and interpreted the data and wrote the initial draft of the manuscript. Dr.Krishnadas Menon conceived the idea for the study, provided advice on study design and methodology and edited the final draft of the manuscript. All the authors have critically reviewed and approved the final draft of this manuscript and are responsible for the content of the manuscript.

### Contribution of the Study to Existing Literature

Coronary artery disease is associated with high mortality. At the threshold of the new millennium, cardiovascular disease is looming large as the new epidemic afflicting Indians at a relatively younger age with severe and diffuse forms of lesions. Recently, the subject of coronary heart disease in Indians has become a challenge for many research centres worldwide. There is a need to identify the risk factors early, especially the social problems that India faces as a developing nation, so that significant measures can be taken to limit the complications of the disease.

### References

1. Wilikinson P, Sayer J, Laji K *et al.* Comparison of case fatality in South Asians and White patients after acute myocardial infarction. *BMJ* 1996 ; 312: 1330-3
2. Wild S, McKeigue P. Cross sectional analysis of mortality by country of birth in England and Wales 1970-92. *BMJ* 1997; 314: 705-10
3. Reddy KS. Cardiovascular disease in India. *World Health stat Q* 1993; 46: 101-7

4. Thankappan KR, Shah B, Mathur P, Sarma PS, Srinivas G, Mini GK, *et al.* Risk factor profile for chronic non-communicable diseases: results of a community based study in Kerala, India. *Indian J med Res.*2010.; 131; 53-63
5. Enas EA , Salim Yusuf, Jawahar Mehta. Meeting of the International Working Group on Coronary Artery Disease in South Asians. *Indian Heart J* 1998; 48: 727-32.
6. Gupta R, Joshi P, Mohan V, Reddy KS , Yusuf S. Epidemiology and causation of coronary heart disease and stroke in India. *Heart J.* 1996; 48: 343-53.
7. Sharma M, Ganguly NK .Premature coronary artery disease in Indians and its associated risk factors. *Vasc Health risk manag.* 2005; 1 : 217- 25.
8. Chadha SL, Radhakrishnan S, Ramachandran K, Kaul U, Gopinath N. Epidemiological study of coronary heart disease in urban population of Delhi. *Indian J Med Res.* 1990; 92: 424- 30.
9. Singh RB ,Sharma JP, Rastogi V, Raghuvanshi RS, Moshiri M, Verma SP , *et al.* Prevalence of coronary artery disease and coronary factors in rural and urban populations of North India. *Eur Heart J.*1997; 18: 1728-35.
10. Kumar R, Singh MC, Ahlawat SK, Thakur JS , Srivastava A, *et al.* Urbanisation and coronary heart disease: a study of urban - rural differences in northern India. *Indian Heart J.* 2006; 58; 126-30.
11. Hughes LO, Raval U, Raftery EB. First myocardial infarctions in Asians and White men. *BMJ.* 1989; 298 v 1345-50.
12. Enas EA, Dhawan J, Petkar S. Coronary artery disease in Asian Indians: lessons learnt and the role of lipoprotein-a. *Indian Heart J.* 1997; 49: 25-34.
13. Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Bkaha MJ, *et al.* Executive summary: heart disease and stroke statistics -2014 update: a report front the American Heart association. *Circulation* 2014; 129: 399 -410.
14. Mohan V, Radhika G, Vijayalakshmi P, Sudha V. Can the diabetes or cardiovascular disease epidemic in India be explained, at least in part, by excess refined grain (rice) intake? *Indian J Med Res.* 2010; 131: 369-72.
15. Jain P, Bhandari S, Siddhu A .A case-control study of risk factors for Coronary heart disease in urban Indian middle-aged males. *Indian Heart J.* 2008; 60: 233- 40.
16. Enas EA, Garg A, Davidson MA , Nair VM, Hurt BA, Yusuf S. Coronary Heart disease and its risk factors in first generation immigrant Asian Indians to the United States of America. *Indian Heart J.* 1996; 48: 343-53
17. Enas EA, Yusuf S, Sharma S. Coronary artery disease in South Asians. Second meeting of the international working group. *Indian Heart J.* 1998; 50: 105-13

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