

How to Prevent and Control the Epidemic of Coronary Artery Disease in Indians

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Coronary artery disease (CAD) prevalence in India is ever increasing. There is a 300% increase in the number of cases since 1970-2000. In the next 15 years, India is projected to have more than half of the cases of CAD in the world.¹

Demographic profile of CAD in Indians points out that it affects the younger population than other CAD subsets across the world.² Hence it therefore affects India's economic growth as the younger section of the society is involved and mainly number of working days are lost.

BURDEN OF CAD

It is the first among top five causes of deaths in Indian population (rural vs. urban, economically backward vs. developed states, men vs. women and at all stages vs. middle age). In 2000, there were nearly 29.8 million people with CAD in India. In 2011, World Health Organisation (WHO) reported the age standardized CAD mortality rates among males and females in India (per 100,000) at 363-443 and 181-281, respectively.³

REASONS FOR INCREASED CAD IN INDIA

The potential explanations for the ongoing epidemic of CAD in India include:

1. Urbanization of rural areas
2. Large-scale migration of rural population to urban areas
3. Dyslipidemia, particularly high non-HDL cholesterol, apo B/apo A ratio and total cholesterol / HDL ratio.
4. Low HDL cholesterol and small dense dysfunctional HDL
5. Increase in sedentary lifestyle
6. Increase in obesity, particularly abdominal obesity.
7. Increase in metabolic syndrome and diabetes.
8. Inadequate consumption of fruits and vegetables.
9. Increased use of atherogenic diet including fried foods, processed foods, fast foods, that are high in calories, saturated fat, and trans fat.
10. Increased consumption of foods -high in glycemic index (high glycemic load).
11. Tobacco abuse
12. Poor awareness and control of CAD risk factors

such high blood pressure, dyslipidemia, and diabetes.

13. Genetic predisposition due to Lp (a) excess

Current estimates from epidemiologic studies from various parts of the country indicate a prevalence of CAD to be between 7% and 13% in urban and 2% and 7% in rural populations.^{4,5} The Global Burden of Diseases Study reported that the disability adjusted life years lost by CAD in India during 1990 was 5.6 million in men and 4.5 million in women; the projected figures for 2020 were 14.4 million and 7.7 million in men and women respectively.

INTERPLAY OF FACTORS

Apolipoproteins: According to INTERHEART study, acute myocardial infarction (AMI) in south Asians occurred at 5 to 10 years earlier than western population; South Asian men encountering AMI were 5.6 year younger than women. This may be due to abnormal ApoB/ApoA-1 ratio.⁶ Asian Indian dyslipidemia is characterised by increased apo-B, triglycerides, Lp(a) and non HDL cholesterol and low levels of HDL and Apo A-1.

Among patients with Lp (a) excess, the CAD risk is increased by 3-fold even in the absence of any other risk factors, and by 8-fold in the presence of low HDL cholesterol levels.⁷

Asian Indians not only have low levels of protective HDL cholesterol, but they also have a preponderance of small dense dysfunctional HDL-cholesterol particles. The latter are associated with less efficient reverse cholesterol transport and less protection against CAD.⁸ The level of HDL-2b, the most protective component of HDL cholesterol, is low in over 90% of Asian Indians.⁹

Diabetes: India has one of the largest populations of diabetics (over 32 million) with a projected escalation to 57.2 million in 2025.¹⁰ The prevalence of type2 diabetes in urban Indian adults has been reported to have increased from less than 3.0% in 1970 to about 12.0% in 2000. On the basis of recent surveys, the Indian Council of Medical Research (ICMR) estimates the prevalence of diabetes in adults to be 3.8% in rural areas and 11.8% in urban areas.¹¹

Hypertension: The count of hypertensives is expected to rise from 118 million in 2000 to 214 million in 2025.¹²

Smoking: India is the third largest country in the world

in both tobacco production and consumption. Of the 1.1 billion smokers worldwide, 182 million live in India.¹³

Fruits and vegetables: Replacement of a traditional diet rich in fruit and vegetables by a diet rich in calories provided by animal fats and low in complex carbohydrates, is happening in all but the poorest countries.

Obesity: Particularly abdominal obesity. Increased waist hip ratio is common in both urban and rural Indians.

Socioeconomic status: Studies in India over the past half century have revealed a similar trend towards a progressive reversal of the social gradient for CHD. Although studies conducted from the 1960s to the early 1990 suggested a direct relationship between income and CAD risk, studies conducted in the last decade have reported an inverse relationship between education and/or income with prevalent or incident CAD.¹⁴

Globalization: Increasing openness to ideas, trade, finances and interconnectedness of countries has had both beneficial and detrimental effects to the burden of non-communicable diseases

FUTURE TRENDS

There will be younger age of escalation of CAD. In fact, the prevalence rate among women is likely to keep pace with that of men in all age groups. In case of rural men and women across age groups, it shows an increase in percentage prevalence in both males and females.

ECONOMIC IMPACT

In Western countries where CAD is considered to be a disease of the aged, 23% of CAD deaths occur below 70 years of age while in India 52% of CAD deaths occur below 70 years of age.¹⁵

The economic impact was estimated to be 9 billion dollars in national income from premature deaths due to heart disease, stroke, and diabetes in 2005 alone, with projected estimates of 237 billion dollars by 2015.²

The total years of life lost due to cardiovascular disease among the Indian men and women aged 35–64 has been estimated to be higher than comparable countries such as Brazil and China. These estimates are predicted to increase by 2030, when differences may be even more marked.

Thus, India suffers a tremendous loss of productivity due to increased prevalence of CHD.

Age standardized CVD death rates in people 30–69 years old are 180 per 100,000 in Britain, 280 per 100,000 in China, and 405 per 100,000 in India. Also, 50% of CVD related deaths in India occur in people <70 years of age, whereas only 22% of CVD related deaths in Western countries occurs in this age group.¹⁶

According to the INTERHEART STUDY, the median age for the first presentation of acute myocardial infarction in South Asian (Bangladesh, India, Nepal, Pakistan, Sri Lanka) is 53 years, whereas that in Western Europe, China

and Hong Kong is 63 years with more men than women affected.⁶

HOW CAN THIS MATTER BE CURBED!!!

Prevention measures should be initiated at root level. Diabetes, smoking, hypertension should be controlled. CAD is seen in much younger Indian population hence strict guidelines and new cut off levels for risk factors should be made. Better support systems and insurance schemes for the young should be initiated. Lifestyle modifications should be explained.

PROPOSALS TO CURB THE RISING INCIDENCE OF CAD

Primordial prevention- Aims at preventing risk factors from developing. Population or public based strategy should be applied. Lifestyle modifications, maintaining ideal body weight, exercises, eating fruits and vegetables, public education and health awareness. Involvement of government and non governmental organisations should be made for this.¹⁷

Primary prevention- Primary prevention, also called high-risk prevention, aims at identifying individuals with markedly elevated risk factors (high blood pressure, high cholesterol, or smoking) who have not yet suffered a coronary event, and targeting them for interventions. Encouraging exercises for 3-45 minutes daily for 5-7 days a week is an example.¹⁸

Secondary prevention- Most rapid impact on CAD outcome. Those with CAD has a mortality of 5% throughout their lives. Drugs like antiplatelets, statins, beta blockers and ACE inhibitors should be made available freely ensuring uninterrupted supply in both government and private sector. Various support groups organizing classes for public to create awareness and importance of the need for taking medicines should be emphasized.¹⁸

CONCLUSION

Herculean task of containing and reversing this epidemic that is affecting the very young working population that India desperately needs at a time of current unprecedented economic boom has to be done.

Effective treatments are available, preventive interventions have been identified and their benefits are well-documented in the literature. This has to be instituted at large.

Obesity, metabolic syndrome and diabetes are emerging as major risk factors. These risk factors are increasing in prevalence in India. They are highly amenable to clinical intervention through primordial prevention (prevention of risk factors) and primary prevention (treatment of existing risk factors).

Barriers to implementation of preventive cardiology are many and include economic constraints, lack of interest by the patient, and lack of skill and/or motivation of the provider. These need to be tackled as well. The first Indo US summit had been organised to tackle these issues.

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