Brief Communication

Potential Gains of Screening Family Members of Suspected Coronary Artery Disease: A Pilot Study

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Abstract

Background: Early diagnosis of asymptomatic coronary artery disease (CAD) is presently targeted in preventive cardiology. A positive family history though not modifiable can provide a window of opportunity for intervening on modifiable risk factors. We assessed the prevalence of risk factors among the family members of suspected CAD patients and estimated their 10 years CAD risk. **Methods:** In a hospital-based cross-sectional study, socio-demographic, personal data and blood samples for total and HDL cholesterol were collected. The risk of having a heart attack in the next 10 years was calculated using Framingham Risk Score. **Results:** The mean age of participants (n = 60) was 40.55 ± 1.78 years. 85% were physically inactive. Smoking (13%), alcohol use (12%), history of CAD (2%), HTN (12%) and diabetes (22%) were the observed risk factors. A family history of CAD at <40 years of age was reported by 7% of subjects. Prevalence of overweight was 21% and 11% were obese. Increased waist-hip ratio (43%), diabetes (22%), hypercholesterolemia (28%), reduced HDL Cholesterol (48%) were other prevalent risk factors. Risk of CAD of >1% in the next 10 years was noted among 60% of subjects. **Conclusions:** Window of opportunity for secondary prevention exists among the family members of suspected CAD.

Keywords: *Coronary stenosis, mass screening, risk assessment*

Introduction

Cardiovascular diseases (CVDs) represent the leading cause of death in the world contributing to almost one-third of all deaths in 2013.[1] Despite this knowledge and notwithstanding the progress made in treating CVDs, no similar progress has been made in secondary prevention,[2] especially in developing countries like India.[3] Coronary artery disease may exist with minimal or no symptoms,[4] often progressing suddenly and/or rapidly. Hence, early diagnosis of asymptomatic CAD remains the basic target of preventive cardiology.[5] Detecting subclinical stages of the disease early, may facilitate identification of candidates with a higher risk of an adverse cardiac event and thus improve their prognosis[6] through appropriate intervention. Individuals with a familial predisposition to atherosclerosis gain the most from preventive interventions, deterring them from developing CAD at an early age.[7] Similarly, a positive family history is well recognized as a consistent and independent risk factor for CAD.[8] While a positive family history is not modifiable, it can be used to identify at-risk individuals, in whom secondary prevention of modifiable risk factors such as hypertension, hypercholesterolemia and smoking can prevent CAD.[9] Thus the potential for secondary prevention of CAD among the family members of suspected CAD patients attending the angiographic clinic was explored. The prevalence of risk factors amongst the family members of suspected CAD patients was estimated and the 10 years CAD risk using Framingham Risk Score was assessed.

Methods

A hospital-based cross-sectional study was conducted during May – June 2016 following approval from the institutional ethics committee. Based on h/o chest pain, risk factor profile and the results of non-invasive stress tests, coronary angiography was advised in high-risk patients for anatomic diagnosis.[10] First-degree family members of these suspected CAD patients who were advised for coronary angiography were considered as study subjects. Inclusion criteria included subjects above the age of 20 years.

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Information on basic socio-demographic characteristics like age, gender, diet (vegetarian or mixed), and physical activity (engaging in a non-occupational physical activity for more than 150 minutes a week) was collected. History of co-morbidities like hypertension/diabetes and treatment history along with family history of CAD, blood pressure, anthropometry (height, weight, BMI, waist and hip circumference) and personal characteristics (like alcohol and smoking) were noted. Finally, awareness of risk factors for CAD was assessed. Blood samples were collected and tested for total cholesterol and HDL cholesterol at the hospital laboratory by standard techniques. Framingham Risk Score[11] was calculated to assess the risk of a person's chance of having a heart attack in the next 10 years using the following variables: Age, Gender, Total cholesterol, HDL cholesterol, Smoking status, Systolic blood pressure and on treatment for hypertension.

The data were analyzed using SPSS software v20.0 software (IBM Corp., Armonk, NY). Continuous data were expressed in terms of mean, standard error (SE) of mean and proportions in terms of percentages.

Results

The mean age of the participants (n = 60) was 40.55 ± 1.78 years with 53% males and 8% were vegetarians. Prevalence of modifiable risk factors is depicted in Figure 1 which shows physical inactivity (85%) as the most prevalent risk factor followed by reduced HDL Cholesterol (48%). BP and blood sugar was never examined in the past by 23% and 22% of subjects respectively. A family history of CAD at <40 years of age was reported by 7% of subjects. Prevalence of overweight was 21% and 11% were obese. Risk of CAD [Table 1] of >1% in the next 10 years was noted among 60% of subjects as per Framingham risk score.

It was observed that 93% were aware that tobacco chewing and advancing age were risk factors. 90% of the participants were aware that consumption of alcohol, lack of regular exercise, high fat diet, stress/worry/anxiety and being overweight were associated risk factors for CAD. Other associated risk factors like high blood pressure, high cholesterol and diabetes mellitus were known to 88%, 85% and 83% of the participants respectively as risk factors for CAD.

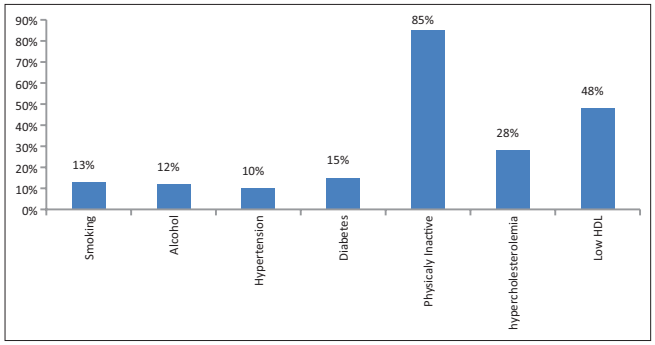

Figure 1: Prevalence of risk factors among the family members of suspected coronary artery disease patients (*n* = 60)

Discussion

Despite the fact that Indian subcontinent has the highest burden of CAD in the world and South Asian immigrants have shown to have a higher prevalence of CAD as compared to other ethnicities, less attention has been paid to CAD in the Indian subcontinent.[12] No doubt, modern medical and surgical interventions are addressing this growing burden to a large extent, but a renewed emphasis on prevention is more appropriate.[5] Evidence has shown that cardiovascular risk reduction in people at risk is feasible in general practice.[13] Elsewhere countries have incorporated universal screening in the national policy recommendations to tackle escalating burden of cardiovascular risk factors and disease.[14] Thus it is reasonable to screen the individuals from the same socio-environmental pool of a known CAD patient that would provide an additional window of opportunity for early detection and appropriate counselling. This helps to identify and target individuals who may have the most to gain from preventive interventions.

Unlike studies conducted in developed countries[15] where comparable general population control group parameters were available and have shown significantly higher percentage of risk of CAD among family members, we have only demonstrated the feasibility and the potential of secondary prevention of CAD. Among the classic risk factors as reported in the INTERHEART study,[16] physical inactivity and dyslipidemias emerged as most prevalent risk factors in our study.

While the knowledge of risk factors of CAD among the study participants was relatively high yet more than half of our study subjects had a risk of CAD of >1% in the next 10 years and the prevalence of risk factors was high. Physical activity, which is being considered as the mainstay of preventing CAD has been poorly practised among the study participants.

Conclusions

Window of opportunity for secondary prevention exists among the family members of suspected CAD patients. Creating awareness about the risk factors of CAD amongst

Table 1: Risk of coronary artery disease among the family members of suspected coronary artery disease in the next 10 years

Framingham risk score	*n* (%)
<1% risk	24 (40)
1%-10% risk	32 (53.3)
11%-20% risk	2 (3.3)
21%-30% risk	2 (3.3)

patients and their family members and counselling for modification may help in reducing the burden.

Limitations

The study involved less number of study participants would compromise generalizability. Due to lack of comparable population-level data on the prevalence of risk factors, the study findings could not be compared.

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Conflicts of interest

There are no conflicts of interest.

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