

Coronary Artery Disease in Young: Faulty Life Style or Heredofamilial or Both

NOEMAN A., AHMAD N., AZHAR M.

Correspondence: Dr. Ahmad Noeman, 13-C, Tech Society, P.O. New Campus, Canal Bank, Lahore

E-mail: ahmadusman1@yahoo.com

Objective: To see the frequency of different risk factors for coronary artery disease in our young population (i.e. age \leq 40 years).

Design: A Descriptive study.

Place And Duration Of Study: Department of cardiac catheterization, Punjab institute of cardiology, Lahore. From January to December 2004.

Sample Size: 459 young patients with documented coronary artery disease were included in this study.

Methods and results: The present study comprised of 459 young patients (\leq 40 years) who presented with symptoms suggestive of ischemic heart disease. All patients were evaluated for conventional risk factors for coronary artery disease (like Diabetes mellitus, hypertension, smoking, dyslipidemia, obesity, waist hip ratio (WHR) and by doing coronary angiography. Out of these 459 patients, there were 376 (81.9%) males and 83 (18.1%) females, mostly belonging to 36 + 4 years age group. 63.4% were chronic smokers and all of them were males. 18.8% subjects gave history of premature coronary artery disease in first degree relatives. Some of them had distinct evidence of psychosocial stress preceding a coronary artery disease episode. Hypertension was detected in 51.4% cases. Obesity was observed in 35% cases. Dyslipidemia was seen in 41.66% cases. 7.14% cases were diabetic. Most ominous combination was smoking, obesity, dyslipidemia and hypertension.

Conclusion Both heredofamilial as well as faulty life style contribute to the development of coronary artery disease in young people.

Key Words: Coronary artery disease, smoking, hypertension.

Coronary artery disease is known to the physicians since 500 BC¹. It involves those individuals who have faulty life style including sedentary habits, increased consumption of fatty foods, smoking, hypertension, etc. These empirical observations have been confirmed by Framingham studies² and atherosclerosis starts at an early age in these individuals. However, there are substantial number of cases who do not have these traits and habits but have very advanced coronary atherosclerosis. Heredofamilial factors, socioeconomic status and psychosocial stress have been blamed in such cases.³⁻⁵ Many of them present with unstable angina, myocardial infarction and angiographic evidence of coronary artery disease even though the risk factor profile and ECG dose not offer much clue for advanced coronary artery disease. On the other hand, there are a few number of cases where the patients are asymptomatic or have minimal complaints. But the ECG shows marked extensive changes of ischemia.

To explain this dilemma, newer coronary risk factors like low High density lipoprotein (HDL), Lipoprotein a (Lp(a)), hyperhomocysteinemia, infectious agents like Chlamydia pneumoniae and cytokines have been implicated.⁶⁻⁸

There is need to identify and correct the conventional risk factors for coronary artery disease. Smoking can increase the risk by 3-5 times while central obesity (depicted by

WHR) even modest increase in body fat with central distribution increases the risk further.⁹

Previous data from different studies have indicated that smoking, hypertension and dyslipidemia if present in young individuals play an important role in the development of premature coronary artery disease.^{2,3,21}

The purpose of the study was to see the frequency of different conventional risk factors for coronary artery disease in our young population.

Methods

A study was carried out in the Department of Cardiac catheterization, Punjab Institute of Cardiology, Lahore from January to December 2004. A total number of 459 patients aged upto 40 years with clinical and ECG features suggestive of ischemic heart disease were included.

Detailed clinical history and examination was carried out with particular reference to smoking, socioeconomic status, lifestyle, family history of ischemic heart disease, obesity, waist hip ratio, and hypertension. ECG, fasting lipid profile, fasting and postprandial blood sugar and cardiac catheterization were done in every subject.

One was considered to be diabetic if his fasting and postprandial blood sugar was \geq 126 and/ or \geq 200 mg/dl

respectively or patients were already on anti-diabetic treatment. Dyslipidemia was defined when any of the lipid fraction was abnormal for example serum cholesterol ≥ 200 mg/dl or HDL ≤ 35 mg/dl, LDL-C ≥ 100 mg/dl or triglycerides ≥ 150 mg/dl.

Variables were analyzed by using SPSS program 10. Frequencies of all variables were generated and standard deviation of quantitative variables like age was also generated. Categorical variables were given in number (percentages / frequencies).

Results

Total number of 459 young patients (≤ 40 years) who presented with symptoms suggestive of ischemic heart disease were studied. All patients were evaluated for conventional risk factors for coronary artery disease (like Diabetes mellitus, hypertension, smoking, dyslipidemia, obesity, waist hip ratio (WHR) and by doing coronary angiography.

Out of these 459 patients, there were 376 (81.9%) males and 83 (18.1%) were females. Age at the time of presentation ranged from 21 to 40 years and the mean age was $36 + 4$ years (mean + SD). Females were somewhat elder to their male counter parts and most of them belonged to 36-40 years age group. 46 (10%) males were between 20-30 while females were 5 (1.1%) only. Between the 31-40 years age group, the males were 330 (72%) and females were 78 (16.99%). The youngest male was 21 years old and was a motor mechanic. He was a heavy smoker. He was a lean and thin individual without hypertension and diabetes. He had low HDL (30 mg/dl).

Table 1: Epidemiological Characteristics of Study Population.

| Characteristics | | Population Number | Percentage (%) |
|-----------------|--------|-------------------|----------------|
| | | (n = 459) | |
| Age | Mean | 36 + 4 | |
| Sex | Male | 376 | 81.9 |
| | Female | 83 | 18.1 |
| Smoking | | 291 | 63.4 |
| Hypertension | | 236 | 51.4 |
| Dyslipidemia | | 191 | 41.66 |
| Obesity | | 160 | 35 |
| Family History | | 86 | 18.8 |
| Diabetes | | 32 | 7.14 |

These patients were evaluated for conventional risk factors and it was found that 291 (63.4%) of young coronary artery disease subjects were chronic smokers. All of them were males and belonged to low socioeconomic group.

Another interesting observation was the fact that as many as 72 (15.68%) males had smoking as the only conventional risk factor. However, many (approximately 116 i.e. 25.27%) had three or four major risk factors and the most common combination was family history, smoking, hypertension, obesity or dyslipidemia. The risk increases as much as 9-16 times when three or more risk factors are present.^{10,11} Family history of premature coronary artery disease was found in 86(18.8%) cases. Obesity was observed in 160 (35%) cases while dyslipidemia was found in 191 (41.66%) cases. Hypertension was detected in 236 (51.4%) cases and diabetes was seen in 32 (7.14%) cases. Most of our patients exhibited central obesity, an indirect clinical marker of hyperinsulinemia. Results are summarized in Table 1.

These results show that smoking is the commonest risk factor for premature coronary artery disease in our population and it is more prevalent in males. Hypertension, dyslipidemia and obesity also contribute to the development of early coronary artery disease while diabetes mellitus is less prevalent in young individuals as a marker of coronary artery disease which is major risk factor in elderly patients.

Discussion

At the threshold of the new millennium, Coronary artery disease is looming as the new epidemic afflicting South east Asians at a relatively younger age with a severe and diffuse form of disease.^{9,12} Premature coronary artery (CAD) disease is defined as occurring below the age of 40 years. This global phenomenon of prematurity and severity suggests that the disease starts at an early age and has a malignant course⁸. The incidence of CAD in the Western population is upto 5% as compared to 12-16% in the South East Asians.¹³⁻¹⁴

Smoking is the commonest risk factor for CAD in the young individuals as was seen in our study³ and causes an increase of 2-3 folds.

Smoking exerts direct toxic effects on myocardium, produces endothelial dysfunction and promotes premature atherosclerosis. High prevalence of chronic heavy smoking in our study may possibly explain why young subjects who have smoking as a sole conventional risk factor develop premature coronary artery disease. Doll and Hill & Hammond and Horn showed that smoking is the commonest risk factor in young patients having CAD.¹⁵⁻¹⁶

Hypertension was detected in 51.4% cases. If we compare this figure with earlier studies it becomes evident that the incidence of hypertension is quite high in patients with CAD. Another fact is that faulty life style, stress and certain genetic factors also play role in premature CAD and hypertension.³⁻⁵ Wilson and Agostino et al. showed that hypertension is an important risk factor in young adults and 7 mmHg increase in diastolic blood pressure is associated with 27.7% increase in coronary heart disease.¹⁷

By the age of 40 years, coronary heart disease is one of the leading causes of death in both diabetic males and females as shown by Cowie and Haris.¹⁸ Diabetes increases the

risk of coronary heart disease by two to four folds as compared with non-diabetics.

The ominous combination of risk factors in our study population was smoking, dyslipidemia and hypertension which was the same as seen in other studies. In a Belgian study, presence of three or more risk factors in an individual was associated with increased risk of coronary artery disease in the young.¹⁹

In addition, hereditary factors like family history of premature CAD also plays an important role in early atherosclerosis which was the same as reported in the previous studies.²⁰⁻²²

Coronary artery disease is increasing in our young population day by day due to faulty life style and certain risk factors already discussed. So what should be done to prevent the early development of coronary artery disease? Whether to start public awareness programs on mass scale level or educate our students in their schools or modify our eating habits and do regular exercise or start early screening programs in patients with family history of premature coronary artery disease.

Conclusions

Premature coronary artery disease is quite common in our young population. Smoking is the commonest risk factor followed by hypertension, dyslipidemia and obesity. Early coronary artery disease can be prevented by modifying our life style, dietary habits and regular exercise. Patients with family history of premature coronary artery disease should undergo an early and regular screening programs.

Acknowledgements

I am thankful to my brother, AHMAD USMAN, and my family for their great support.

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