

Original Article

Prevalence of Coronary Artery Atherosclerosis in Different Age Groups: A Post-Mortem Study

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Abstract:

Coronary artery atherosclerosis (CAA) leads to ischemic heart disease and that is the most common cause of cardiac deaths worldwide. The incidence is more among the elderly people, but now gradually increasing among the young. The study was done to evaluate the prevalence of CAA in different age group by post-mortem study. An observational study was conducted in the department of Pathology of Faridpur Medical College (FMC). In this study total 53 postmortem histopathological examination of heart were done and analyzed, of them 37 were male and 16 were female. Among all, CAA was found in 8 cases and all were male. Regarding age, 4(50%) cases were in the age group from 41 to 50 years, 3 cases were in age of above 60 years and one case was in the age group from 51 to 60 years. Left CAA was observed in 6(75%) cases, both right and left CAA was found in remaining 2(25%) cases but none was found to involve only right coronary artery. Lowest age of involvement of CAA was 42 years that involved left coronary artery. This study shows that the prevalence of CAA is increasing among the younger age group.

Key words: Coronary artery atherosclerosis (CAA), Histopathology, Autopsy, Postmortem.

Introduction:

The commonest disease affecting the coronary arteries is atherosclerosis and an atherosclerotic lesion may be found at varying stages of its development in different age groups.

The development, progression and occurrence of atherosclerosis are the result of interplay of several predisposing and precipitating factors. Coronary atherosclerosis is a great concern in young adult, because of its potential to cause great incapacitation¹. Although patients with coronary artery disease

typically become symptomatic after age 40 years, necropsy studies have demonstrated that atherosclerotic changes in the vessel wall begin early in life²⁻⁶.

Coronary artery disease is responsible for over 70% of sudden cardiac deaths but in the young, primary cause of death is the nonatherosclerotic coronary abnormalities⁷. The prevalence of coronary atherosclerosis is highly variable according to age, sex and place. Risk factors for coronary atherosclerosis like hypertension, diabetes, cigarette smoking and high cholesterol diets are sharply rising in the developing world⁸. We interpreted the postmortem histopathological examination that may reflect the prevalence of coronary atherosclerosis in different age groups.

Material and methods:

This observational study was conducted in department of Pathology of Faridpur Medical College from January 2016 to December 2018. Postmortem histopathological examination of 53 hearts were done among those viscera sent from forensic medicine department for histopathology to exclude the cardiac pathology as the cause of death, who had history of unnatural and suspicious (accidental, suicidal, homicidal, etc.) death. Data were collected in a data collection sheet. After collection, data were presented accordingly.

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Result:

In this study, among 53 cases 37(69.8%) were male and 16 (30.2%) were female. Maximum cases (14) were in age group from 41 to 50 years, 12 cases were from 20 to 30 years, 11 cases were from 31 to 40 years, 11 cases were in above 60 years and 6 cases were from 51 to 60 years. Among all cases CAA was observed in 8 (15%) cases and all were male (Table I).

Table I: Distribution shows incidence of CAA (n=53).

Status	Total (%)	Male (45)	Female (16)
Normal	45(85%)	37	16
CAA	8(15%)	8	0

Among all the CAA 4(50%) cases were in age group from 41-50 years, 3(37.5%) cases were in age of above 60 years and one case was in the age group from 51 to 60 years (Table II).

Table II: Prevalence of CAA in Different Age Groups (n=8).

Age group (years)	CAA
20-30	0
31-40	0
41-50	4(50%)
51-60	1(12.5%)
>60	3(37.5%)

Table III shows the pattern of coronary artery involvement. Left CAA was observed in 6(75%) cases, both right and left CAA was found in remaining 2(25%) cases but none was found to involve only right coronary artery. Lowest age of involvement of CAA was 42 years and involved only left coronary artery. Maximum cases (4, 50%) belong to age group of 41 to 50 years. Among them 3 cases had only left CAA and one case had both right and left CAA.

Table III: Pattern of CAA in different age group (n=8).

Age group (years)	Left CAA	Right CAA	Both right and left CAA
20-30	0	0	0
31-40	0	0	0
41-50	3	0	1
51-60	0	0	1
>60	3	0	0
Total (8)	6 (75%)	0	2(25%)

Discussion:

Atherosclerosis is a chronic degenerative condition of arteries responsible for significant cardiovascular morbidity and mortality worldwide. In Indian subcontinent, it is reported to be responsible for more than 25% of deaths⁹. Atherosclerotic lesions start developing at an earlier age and are found to be in more advanced stages in Indian population as compared to the patients in western countries¹⁰.

In our study 50% of all CAA was observed in the age range from 41-50 years. A study in India by Sanjeet K et al¹¹ shows highest number of CAA was observed in the age range from 30-40 years, which is more earlier occurrence of CAA than our study. Our study findings are consistent with earlier studies in India by Yazdi SA et al¹² and Singh H et al¹³. Thus, result shows increasing prevalence of atherosclerosis in younger age groups but severity varies. They also found that significant atherosclerotic lesions start developing from 2nd decade of life and onwards. But in our study no body affected before the age of 42 years.

Age is a powerful risk factor for coronary heart disease. The development of atherosclerosis increases markedly with age up to an age of about 65, regardless of sex and ethnic background^{14,15}. In our study 37.5% of affected cases were in the age of 60 years and above. In our study the number is significant in this age group.

In this study all affected cases were male. This may be explained by less incidence of CAA in female and total number of female in the study was less; 16 (30.2%). Males have a relative preponderance of coronary heart disease as is evident from other study in India by Sneha P et al¹⁶; they found incidence of atherosclerosis 76.47% in males while 23.53% in females. In the study conducted by Garg M et al¹⁷; they found atherosclerosis in 80.9% of males and in 19.1% of females. There may be protective role of female hormones like estrogen against atherosclerosis. Moreover, there is greater indulgence of males in smoking and alcoholism as compared to females¹⁶.

In our study most commonly affected vessel was left coronary artery that was 75% of total. Both right and left CAA was observed in 25% cases. There was no case that had only right CAA. In a study in India by Sneha P et al¹⁶, shows the incidence of coronary involvement in left anterior descending artery was more than involvement of right coronary artery. Our findings were also in concordance with the data given by Sudha ML et al¹⁸, who showed left anterior descending artery as the most commonly involved artery followed by right coronary artery.

Conclusion:

The study shows the incidence of CAA is increasing among the young people and male are affecting more. Left CAA is more common. The study involves a small sample size. But observation of this study is very important socio demographically as well as overall assessment, prevention and management of cardiovascular events. That will play a big role for the improvement of mortality and morbidity.

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