# Prevalence of Coronary Atherosclerosis in Different Age Groups: A Post Mortem Case Study

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**Abstract:** Background and Objective: The Coronary Atherosclerosis is one of the common disease in elderly people. Now it is growing fast in young persons. This Study is to evaluate the prevalence of coronary atherosclerosis in younger verses older age group. Method: A Study of 150 cases was carried out at our department. A detailed postmortem examination was done. Representative samples from both right and left coronary arteries were taken and processed by routine paraffin method and H&E stain. Slides were examined microscopically for histo-morphology and graded in mild, moderate and severe categories. Result: Total 150 cases were taken age ranging from 22 to 70 years, in which 108 cases were male and 42 cases were female. Among them atheromatous lesion were noted in 83 males and 17 females .In 22-40 years age group 41 males and 10 females were affected. In 41-50 years age group 17 males and 2 females were affected. In 50-70 years age group 26 males and 5 female were affected. Conclusion and Interpretation: Previously Atherosclerosis was more prevalent in older peoples and mean age of presentation was around 50 years. But from this study result we can conclude that now its prevalence is increasing in younger age group also.[Sneha P NJIRM 2017; 8(2):103-105]

**Key words:** Atherosclerosis, Prevalence, Younger Age.

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**Introduction:** The development, progression and occurrence of atherosclerosis are the result of interplay of several predisposing and precipitating factors. Coronary atherosclerosis has emerged as a major social epidemic in India. Coronary atherosclerosis is great concern in young adult, because of its potential to cause great incapacitation .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 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 world with early younger age involvement.[1]So we planned a post mortem study to investigate the prevalence of coronary atherosclerosis in different age groups from 22-70 years old persons.

**Method:**The study was conducted from June 2016 to august 2016 at Department of Pathology, BJ Medical College, Ahmedabad, Gujarat. The legal proceedings and permission were availed from ethical committee and administration when ever required for study. The hearts of 150 successive autopsies were grouped according to age and sex. The specimens were fixed in 10% formalin solution for 2-5 days. The coronary arteries were dissected and examined grossly for thickening, yellow streaks, frank plaque or calcification. Identified segments of the coronary arteries viz. left anterior descending coronary artery (LADA) and right coronary artery (RCA) were sectioned and histopathological slides were made. The intimal changes, atherosclerotic changes and approximate luminal narrowing (in percentage of luminal area) were noted in each section. The degree of atherosclerosis was taken as the percentage of the cross-sectional area of occlusion of the lumen at the maximum point of occlusion of the respective artery. According to these criteria atherosclerotic lesions were graded in mild, moderate and severe category. Photomicrographs of the sections were taken (Figure 1 to 4) and observations were made.

**Figure 1: Mild Atherosclerosis**

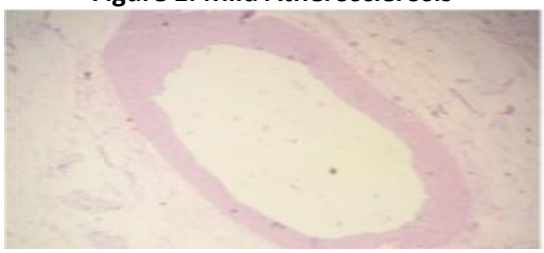


**Figure 2: Moderate Atherosclerosis**

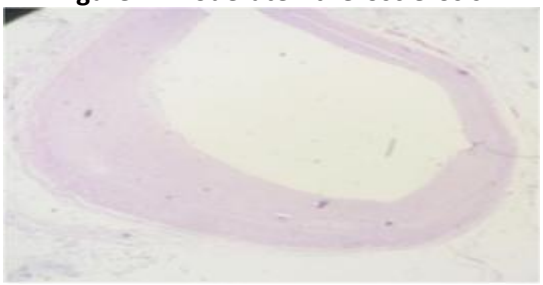


**Figure 3: Severe Atherosclerosis With Calcification**

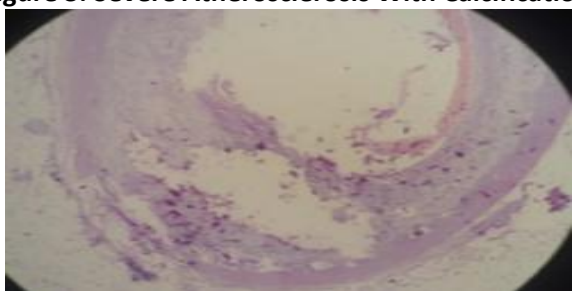
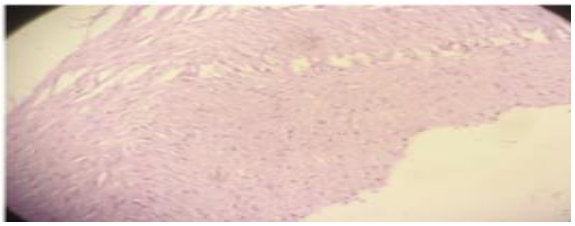


**Figure 4: Atheromatous plaque formation**



**Result:** In present study 150 cases were studied for atherosclerotic changes, in which 108 cases were male and 42 cases were female. Among 108 males, 91(84.25%) males showed changes of atherosclerosis and 25 (23.14%) males were normal. In 42 females, atheromatous lesions were found in 28 (66.66%) females and 14 (33.33%) females showed no atherosclerotic changes. The observations of the study were grouped according to age groups and sex (Table 1).

**Table 1: Prevalence of coronary Atherosclerosis in different age groups**

| Age group | Total hearts | | Atherosclerotic luminal narrowing | | | | | | Total Atheromatous Lesions | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mild | | Moderate | | Severe | | | |
| | M | F | M | F | M | F | M | F | M | F |
| 20-40 | 48 | 20 | 7 | - | 18 | 10 | 16 | - | 41(85.41%) | 10(50%) |
| 41-50 | 22 | 4 | 2 | 1 | 2 | 1 | 13 | - | 17(77.27%) | 2(50%) |
| 51-70 | 38 | 18 | 12 | - | 4 | 2 | 17 | 14 | 33(86.84%) | 16(88.88%) |
| Total | 108 | 42 | 21 | 1 | 24 | 13 | 46 | 14 | 91(84.25%) | 28(66.66%) |

Correlation of age with number of coronary vessels involved is shown in Table 2.

**Table 2: Correlation of age with number of coronary vessels involved**

| Age | Single vessel disease | | Double vessel disease |
|---|---|---|---|
| | Left Anterior Descending Artery | Right Circumflex Artery | |
| 21-40 | 18 | 4 | 29 |
| 41-50 | 5 | 2 | 10 |
| 51-70 | 8 | 17 | 34 |
| Total | 31 | 23 | 73 |

**Table 3: Comparison with another similar study**

| Present Study | | | Similar another study | | |
|---|---|---|---|---|---|
| Age Group | Total Atheromatous Lesion | | Age group | Total Atheromatous Lesion | |
| | M (%) | F (%) | | M (%) | F (%) |
| 21-40 | 85.41 | 50 | 21-40 | 85.71 | 50% |
| 41-50 | 77.27 | 50 | 41-50 | 76.92 | 50 |
| 51-70 | 86.84 | 88.88 | 51-70 | 88.88 | 100 |
| Total | 84.25 | 66.66 | Total | 83.72 | 57.14 |

**Discussion:** Age is a powerful risk factor for coronary heart disease. Morbidity and Mortality due to coronary atherosclerosis in India has reached alarming proportions and expected to maintain upward trend in the next decade. The development of atherosclerosis increases markedly with age up to an age of about 65, regardless of sex and ethnic background.[2,3]The onset of atherosclerosis starts early in life from childhood and gradually progresses through young adulthood to form lesions that causes coronary heart diseases later in life.

In the present study the overall incidence of atherosclerosis was found to be 86.84% in 51-70 year age group male patients, while in age group 22-40 year it was 84.41%.Thus, result show increasing prevalence of atherosclerosis in younger age groups. In our study we found that there is a progressive steady increase in atherosclerosis of coronary vessels from 2nd decade of life. Our findings corroborates well with findings of earlier studies in India. Yazdi et al.[4]Wig et al and singh et al[5], also found that significant atherosclerotic lesions start developing from 2nd decade of life and onwards.

Comparison of present study with similar study performed by Sanjeet kumar et al[6];at Lucknow India which include is shown in Table 3, which showed result similar to our present study.

In this modern globalized era, where human life style has become more and more complex and challenging. Various life stressors (anxiety, depression etc.) along with a sedentary lifestyle and lack of exercise and poor dietary habits like intake of junk food and increased use of refined and processed food items in place of whole grains and fruits and vegetables can be important factors for earlier initiation of development and progressive increase in atherosclerotic lesions in this young Indian population.

Males have a relative preponderance of coronary heart disease as is evident from our study we found incidence of atherosclerosis 76.47% in males while 23.53% in females. In the study conducted by Garg et al[7], 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 females.

Incidence of coronary involvement in Left anterior descending artery was more than involvement of Right coronary Artery .This was in concordance with the data given by Sudha et al[8], who showed Left anterior descending artery as the most commonly involved artery followed by RCA.

**Conclusion:** The study showed high prevalence of atherosclerosis; especially in the relatively young population with no prior history and where the diagnosis of coronary atherosclerosis was least suspected. However, there is a male preponderance but there is a progressive increase in the proportion of females. The study of human atherosclerotic lesion is an extremely difficult in living subject and autopsy study is the best possible way to work on it.Previously Atherosclerosis was more prevalent in older peoples and mean age of presentation was around 50 years. But from study result we can conclude that now its prevalence is increasing in younger age group also.

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