



Original Article

Autopsy findings of coronary artery disease: A 6-month study at a rural tertiary care center

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ABSTRACT

Background: Atherosclerosis is a general term used for all conditions involving thickening and hardening of arterial walls. Atherosclerosis is the most common and important type of coronary artery disease. In almost all developed countries and India the prevalence and incidence of ischemic heart disease is increasing. The objective of the present study was to examine the coronary tree, study grades of atherosclerosis, complications of atherosclerosis like plaque disruption, inflammation, and calcification, and identify the severity of atherosclerosis according to age and gender.

Materials and methods: This was a retrospective observational study conducted during 6 month period between January 1st, 2023 and June 30th, 2023. A total of 89 patients of different age groups were brought for postmortem examination. During postmortem examination, the heart was removed and examined. Macroscopic and microscopic changes were noted.

Results: Of the 89 cases, 62 were male and 27 were female. Coronary atherosclerosis was present in 69 (77.52%) of the patients. Atherosclerosis was present in 53 men (76.81%) and 16 women (23.18%). Men are affected more than women. The majority of the patients (24.63%) were in the 41-50 years age group, followed by those in the age group of 31-40 years (21.73%), while (21.73%) were in the 61-70 years age group.

Conclusions: The incidence of atherosclerosis is higher in men. This study highlights the necessity of screening for cardiovascular problems starting in the early thirties.

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INTRODUCTION

Arteriosclerosis is the “hardening of the arteries”. It is a general term for the thickening and loss of elasticity of the artery wall, primarily due to the involvement of tunica intima, and is characterized by fibrofatty plaques or atheroma.³ The aorta, coronary arteries, and cerebral systems are frequently affected.¹ Blood flow to the heart is mainly provided by the right and left coronary arteries.⁴ In the last three to four decades the consequences of coronary artery disease have doubled in the Indian population. It is postulated to become the most common disorder, causing almost a third of all deaths in India.⁵

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In atherosclerosis, there is a narrowing of major coronary arteries, which over a period of time leads to ischemic heart disease which is now one of the leading causes of early deaths in men in 146 countries and women in 98 countries.⁶

MATERIALS AND METHODS

This research was conducted over 6 months period between January 1st, 2023 and June 30th, 2023. A total of 89 patients from various age groups were brought for autopsy at Swami Ramanand Teerth Rural Government Institute Ambajogai Medical College. The current study is an observational retrospective study with convenient sampling. After the autopsy, the heart was removed and sent to the pathology section for histopathological examination to detect heart disease. Macroscopic findings were noted. Samples of the entire right coronary artery, left coronary artery and the left anterior descending coronary artery were collected at an interval of 1 cm. Tissues were then fixed in 10% formalin and embedded in paraffin. For histological studies, sections were taken from paraffin blocks and stained with hematoxylin and eosin. All histological sections were analyzed under the microscope to detect atheroma. Atherosclerotic plaques were classified as per the American Heart Association.

Grade 0 - no change

Grade 1 - isolated foam cells in the intima (very little change)

Grade 2 – More foamy cells in the intima, mostly layered (fatty streaks)

Grade 3- Undefined extracellular pools of lipid (intermediate lesion)

Grade 4- well-defined lipid core, normal intima present on the luminal surface (atherosclerosis/ fibrous plaque)

Grade 5 - fibrous with or without calcification capped lipid core (fibroatherosclerosis)

Grade 6 - fibroatherosclerosis with capping defects such as bleeding and thrombus.⁷

The following criteria were included and excluded for this research.

Inclusion criteria

1. Identified bodies taken.
2. Only the intact heart was taken in this study.
3. Only hearts sent for histopathological examination were included

Exclusion criteria

1. Unknown/unidentified persons
2. Cases with signs of decomposition

RESULTS

A total of 89 cases were studied at the Department of Pathology, SRTR Medical College. Of the total 89 cases examined, 62 were males and 27 were females. Male to

female ratio was 2.3:1. Out of 89 patients, 69 (77.52%) had atherosclerosis; 53 of them were men (76.81%) and 16 were women (23.18%) with an affected male-to-female ratio of 3.3:1.

This study shows that men are more affected than women. The majority of the patients (24.63%) were in the 41-50 years age group, followed by those in the age group of 31-40 years (21.73%) and (21.73%) were in the 61-70 years age group.

The following grades of atherosclerosis were found in this study: Grade1 in 10 men and 4 women; Grade 2 in 20 men and 4 women; Grade 3 in 3 men and 1 woman; Grade 4 atherosclerosis was found in 6 men and 2 women; Grade 5 in 11 men and 4 women; Grade 6 atherosclerosis was detected in 3 men and 1 woman.

The involvement of coronaries identified were as follows- 1 coronary in 10 cases; 2 coronaries in 20 cases; 3 coronaries in 39 cases.

DISCUSSION

This study aimed to assess the incidence and severity of the disease in our population. The incidence in our study was 77.5%, which is similar to studies by Garg et al, Virmani et al, Thej et al, and Puri et al. The studies by Vyas P et al., Golshahi et al., Garg et al., and Yazdi et al., have all found similar results.⁸⁻¹¹

Table 1: Percentage of atherosclerosis, compared with other studies.

Studies	Atherosclerosis percentage
Present study	77.5%
Vyas P et al ⁸ .	73.45%
Kavitha M et al ¹² .	79%
Golshahi et al ⁹ .	29.4%
Garg et al ¹⁰ .	46.4%
Yazdi et al ¹¹ .	40%

Table 2: Gender distribution of atherosclerosis, compared with other studies.

Studies	male	Female
Present study	77%	23%
Kavitha M et al ¹² .	82.27%	17.73%
Garg et al ¹⁰ .	80.9%	19.1%

Current research shows that men are more affected than women. Research studies provide a means of understanding important processes that influence the treatment of atherosclerotic cardiovascular diseases. There is currently no best way to diagnose atherosclerosis. In this study, the prevalence of atherosclerosis was 77.52%. In this study, age ranged from 1 to 80 years. The prevalence and duration of atherosclerosis increases with age.

Grade 2 atherosclerosis was the most common lesion seen in this study accounting for 24 cases followed by 20 cases of grade 5 atherosclerosis. Grade 2 lesions were common in males followed by grade 5 lesions. While in females grade 3 and grade 5 lesions were common. The most severe form (grade 6 lesion) was seen in 3 males and 1 female.

A calcified lesion was observed in 1 male while thrombus formation was seen in 1 male.

CONCLUSIONS

According to this study, the incidence of atherosclerosis is higher in men, but its incidence is associated with both genders. Screening for cardiovascular problems starting in the early thirties is necessary to prevent some deaths. Present study contributes to studies to predict the future burden of this disease in our society, develop appropriate health policies, and plan preventive measures to help target groups. Similar studies with larger samples should be performed periodically to confirm the effect.

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