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RESEARCH ARTICLE

ATHEROSCLEROTIC CHANGES IN THE CORONARY ARTERIES AMONG THE AUTOPSIED CASES ABOVE THE AGE OF FORTY IN A TERTIARY CARE CENTRE, NORTH KERALA

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ABSTRACT

Back ground: Atherosclerosis also known as arteriosclerotic vascular disease or ASVD is a condition in which an artery wall thickens as a result of the accumulation of fattymaterials such as cholesterol. It is a syndrome affecting arterial blood vessels (Ruffer, 1619). The basic mechanism is stenosis or occlusion of one or more branches of the coronary arteries by atheromatous lesions or one of the complications of such a lesion.

Objective: To study the occurrence of atherosclerosis in coronary arterysegments in the autopsied patients above the age of 40

Materials and Methods: The study was conducted in the Department of Forensic Medicine, Govt. Medical College, Kozhikode over a period of 01/01/2012 to 12/03/2012. A total number of 100 cases were analysed during the study. The criteria for selection were men and women above the age of 40 during the period of study.

Results: Among the 100 subjects studied,simple atheroma was seen in 38%cases, plaque rupture with thrombosis in 5% , coronary artery calcification as well as calcified atheroma in13% and 44% showed fatty streaks. Atheromatous changes were seen more among the males and the association was found to be significant, but there were no association found between age and changes like atheroma and thrombosis secondary to atherosclerosis, but coronary artery calcification and calcified atheroma was more among the age group more than sixty.

Conclusion: The main atherosclerotic change seen above the age forty was simple atheroma and it was associated with males.

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INTRODUCTION

Atherosclerosis is a slowly progressive disease of arteries, marked by elevated fibro fatty intimal plaque involving large to medium sized muscular arteries like coronary arteries. The basic mechanism in Atherosclerosis is stenosis or occlusion of one or more branches of the coronary arteries by atheromatous lesions or one of the complications of such a lesion. The whole length of the coronary arterial system is not uniformly vulnerable to atheromatous lesions. The most common sight of occlusion is in the first two centimetres of the anterior descending branch of the left coronary artery (Bernard Knight, 1996). The next most frequent site is in the right coronary artery, According to response to injury hypothesis, atherosclerosis is a chronic inflammatory and healing response of the arterial wall to endothelial injury (Robbin's and Cotran, 2010). Haemodynamic changes in the blood flow precipitate intimal changes predisposing to atherosclerosis. The predisposition of atherosclerosis to involve the coronary arteries makes ischemic cardiac death a common end. The importance of hemodynamic turbulence in atherogenesis is illustrated by the observation that plaques tend to occur at ostia of existing vessels, branch points, and along the posterior wall of the abdominal aorta, where there are disturbed flow patterns. (Robbin's and Cotran, 2010) The heart has both an extramural and an intramural arterial system. Their totally different environments give reason for their functional andpathological dissimilarities (Gray's Anatomy, 2005). This study proposes to find out types of atherosclerotic changesoccurred in the coronary arteries. The gender variation with the atherosclerotic changes was also studied.

Objectives

To study the occurrence of atherosclerosis in coronary arteries in the autopsied patients above the age of 40.

MATERIALS AND METHODS

Study design: Descriptive cross- sectional study

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Study setting

The study was conducted in the Department of Forensic Medicine, Govt.Medical College, Kozhikode over a period of 01/01/2012 to 12/03/2012.

Inclusion criteria: Men and women above the age of 40 during the period of study.

Exclusion criteria:

1. Cases below the age of 40 years since hemodynamic changes would not affect the vessel wall.
2. Decomposed bodies
3. Severe burns with charring of internal organs.
4. Other situations like pericarditis, cases with coronary bypass graft, and dense fibrotic changes of pericardium were exempted from the study as complete coronary dissection was difficult.

Sampling

Convenient sampling

A total number of 100 cases were analysed during the study.

Methodology

During the routine autopsy by Lettule's method, the heart was removed and opened by the Virchow's method in the direction of blood flow. Its weight was measured; epicardium, valves and chambers were noted. The three epicardial coronary arteries and their major branches were examined by making serial 3mm cross sections with a lancet. The coronary artery was then openedalong its length with small scissors and the branches were identified. The severity of the atherosclerotic change was noted as: simpleatheroma, complicated plaques like calcified atheroma, rupture of plaque and thrombosis.

Ethical aspects

Study protocol was submitted to the Institutional Research Committee as well as Institutional Ethics Committee of Govt. Medical College, Kozhikode and clearance was obtained for conducting the study

Key words:

Atherosclerosis: Atherosclerosis is a disease of the arteries charecterised by the deposition of fatty material on their inner walls

Atheroma: Atheroma is an accumulation of degenerative material containing lipids, calcium, variable amount of fibrous connective tissue and macrophages in the inner layer of an arterial wall.

Plaque rupture with thrombosis: Rupture of the endothelium of arterial wall and the fibrous cap of the atheroma resulting in shower of debris from the plaque combined with platelet and clotting response resulting in narrowing, sometimes closure of lumen.

RESULTS AND DISCUSSION

The study included 100 cases, out of which 79% were males and 21% females. The mean age (SD) was 58.42(9.51).out of 100, 54 % were in the age group below 60 years and 46% were more than 60 years. The main atherosclerotic change was found to be atheroma 38%, thrombosis secondary to plaque rupture 5% and calcified atheroma 13% and 44% showed fatty streaks. All these Atherosclerotic changes were more in the Left Coronary artery and it was found to be significant. It may be due to the increased turbulence of blood flow through the left coronary artery due to more branching sites.

Table 1. Atherosclerotic changes

Types	No	%
Atheroma	38	38%
Thrombosis	5	5%
Calcified Atheroma	13	13%
Fatty streaks	44	44%

The associated factors of atheromatous changes

Table 2. The Associated factors and atheroma

Factors	Atheroma		P value
Age	Yes (38)	No (62)	
<60 (54)	19(35.2%)	35(64.8%0	0.336
>60 (46)	19(41.3%)	27(58.7%0	
Sex			
Males (79)	42 (53.2%)	46.8%	0.000
Females (21)	20(95.2%)	0.8%	

The Atheroma was seen more in the age group more than sixty but it was not statistically significant. The males showed a significant association with atheroma. The study conducted by Ganeshnarayana, Nagaraja *et al*. (2016) also showed a significant association between sex and atheroma. The thrombosis didnot showed any significant association with age and sex. Calcified atheroma was more in the subjects with age group more than sixty and the association was statistically significant, calcified astheromawas more in females when compared with males but it was not statistically significant.

Table 3. Associated factors and calcified atheroma

Factors	Calcified Atheroma		P value
Age	Yes (38)	No (62)	
<60 (54)	4(7.4%)	39(92.6%)	0.003
>60 (46)	9(19.5%)	35(80.5%)	
Sex			
Males (79)	10 (12.7%)	9(87.3%)	0.121
Females (21)	3(14.2%)	18(85.2%)	

Conclusion

In this study the incidence of atherosclerosis was maximum in the Left coronary artery, but calcification appears to be age related. Among the Atherosclerotic changes simple Atheroma was found to be more. The age group and sex showed association with atheroma and calcified atheroma.

Acknowledgement

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