



A HISTOPATHOLOGICAL ANALYSIS IN AUTOPSY SPECIMENS OF HEART

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ABSTRACT **Background:** The incidence of heart diseases has markedly increased in India over the past few years. The term "sudden cardiac death" (SCD) refers to death from abrupt cessation of cardiac function due to cardiac arrest.

Aim and Objective: The aim of the study was to determine various histological findings in heart specimens.

Materials and Methods: This retrospective and prospective comparative study was carried on autopsy specimen of heart received over the period of 3 years (June 2017 – May 2020) in department of pathology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand.

Results: A total of 104 heart specimens were received, out of which 82 cases had abnormal findings.

Conclusion: The most common heart disease was atherosclerotic coronary artery disease followed by hypertensive heart disease.

KEYWORDS : Autopsies, Atherosclerosis MI, Hypertensive heart disease

INTRODUCTION

The term "sudden cardiac death" (SCD) refers to death from abrupt cessation of cardiac function due to cardiac arrest. Sudden unexpected death due to cardiovascular diseases occupy almost a half of those natural deaths and more than 80% of the cardiovascular deaths are associated with coronary atherosclerosis.⁽¹⁻⁴⁾ Coronary artery disease due to atherosclerosis is an epidemic in India. The projected death from coronary artery disease by 2015 is 2.95 million, of which 14% will be < 30 years, 31% will be < 40 years.⁽⁵⁾ Moreover, atherosclerosis is a complex process involving inflammation and cellular proliferation in the arterial wall that is mediated by a variety of growth factors, cytokines, thrombotic factors and vasoactive molecules.⁽⁶⁾ Reduced mortality from infectious diseases prevalence of ischemic heart disease in developing nations⁽⁷⁾ Hypertensive heart disease (HHD) is a consequence of the increased demands placed on the heart by hypertension causing pressure overload and ventricular hypertrophy. Although most commonly seen in the left heart as the result of systemic hypertension, pulmonary hypertension can cause right-sided HHD, or *cor pulmonale*.⁽⁸⁾

MATERIAL AND METHOD

The present study includes 2 years of retrospective (June 2017- May 2019) and 1 year of prospective (June 2019- May 2020) study of medicolegal autopsies of heart conducted in department of pathology, RIMS, Ranchi. A total of 104 heart specimens were sent for histopathological examination. For the retrospective period, all cases were taken out from records and reviewed. In the prospective period, all heart specimen was received in 10% formalin and processed as per the standard. All sections were stained with hematoxyline and eosin (H & E) stain.

RESULT

The present study consisted of series of 104 autopsy cases from RIMS, Ranchi, India conducted over a period of 3 years. Abnormal findings were found in 82 cases and 22 cases showed no specific cardiovascular lesions. Out of 104 cases, 78 (75%) were males and 2(25%) were females. The majority (27.9%) belonged to 51-60 years followed by 41-50 years (25%). (Table. 1) The most common heart disease was atherosclerotic coronary artery diseases: 54 cases (52 %) followed by hypertensive heart diseases: 8 cases (7.7%). (Table. 2)

Table. 1: Age And Sex Distribution Of The Cases

Age group	Male	Female	Total	Percentage
< 20	5	3	8	7.7
21-30	9	3	12	11.5
31-40	9	5	14	13.5
41-50	19	7	26	25
51-60	23	6	29	27.9
61-70	10	2	12	11.5
>71	3	-	3	2.9
Total	78(75%)	26 (25%)	104	100

Table. 2 : Various Pathological Lesions Found In Heart And Aorta And Their Incidence

Pathological lesion	Total	Percentage
I. Ischemic heart disease		
Atherosclerotic coronary artery disease	54	52
II. Hypertensive heart disease	8	7.7
III. Cardiomyopathies		
Hypertensive cardiomyopathies	6	5.8
Myocarditis	5	4.8
IV. Valvular disease		
Rheumatic heart disease	3	2.9
Infective endocarditis	2	1.9
V. Pericardial disease		
Pericarditis	2	1.9
VI. Congenital heart disease		
Tetralogy of Fallot	1	1
VII Metastatic lesion	1	1
VIII No specific cardiovascular lesion	22	21

DISCUSSION

The term "autopsy" is derived from the ancient Greek word autopsya means "to see for oneself", autos ("oneself") and opsia ("eye").^(9,10) This present study consist of 104 heart specimens. Majority of cases belonged to male patients (75%). The most common age group involved were 4th -6th decade (52.9%) followed by 3rd decade (13.5%). Similarly Bhargava et al. showed 74.8% males and 24.2% females in their study.⁽¹¹⁾ The males indulge more in smoking, alcoholism and are more vulnerable to accidents, violence and stress.

Among the heart disease, the most common cause was

atherosclerotic coronary heart disease (CAD) : 54 cases (52%) followed by hypertensive heart disease (HHD): 8 cases (7.7%). Dhruva et al⁽¹²⁾ and Garg M et al⁽¹³⁾ reported increased frequency of atherosclerosis from 3rd decade onwards. Stressful, sedentary lifestyle, lack of exercise and poor dietary habits are important factors for early initiation and development of atherosclerosis in young generation. Triple vessel disease was most common morphological lesion observed in 22 cases (40.7%) of atherosclerotic CAD followed by double vessel involvement (18 cases, 33.3%) then single vessel involvement in 14 cases(26%). It is similar to study conducted by Garg M et al⁽¹³⁾ who reported 44.4% of triple vessel involvement. Myocardial infarction (MI) was observed in 37 out of 54 cases of atherosclerotic CAD. Histologically in atherosclerosis, there is outward remodelling which manifests as thinning of media underlying the plaques in comparison to relatively thicker spared wall opposite of plaques.(Fig. 1)

In present study, changes of hypertensive heart disease were observed in 8 cases out of 104 cases (7.7%). All cases had history of long standing hypertension. Grossly, weight of the heart in all cases exceeded 450 grams and increase in ventricular thickness.(Fig. 2) Histologically, all cases showed varied degree of atherosclerosis in aorta and coronaries.

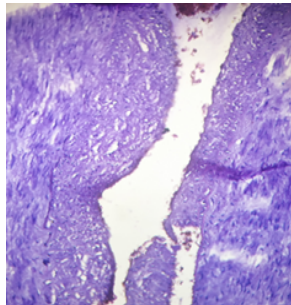


Fig. 1: Atherosclerosis Of Right Coronary Artery,H & E Stain.

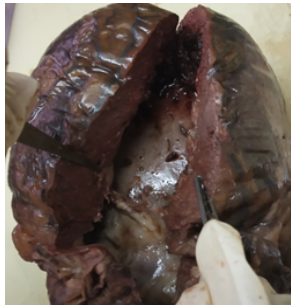


Fig. 2: Gross Appearance Of Heart With Increased Ventricular Thickness.

Cardiomyopathies included 6 cases (5.8%) hypertrophic cardiomyopathy and 5 cases (4.8%) of myocarditis. These lesion are more common in young males. Among valvular disease, 3 cases (2.9%) of rheumatic heart disease and 2 cases (1.9%) of infective endocarditis. 2 cases of pericarditis were found of which one was 21 day old male child and other was a case of tuberculous pericarditis. 1 case of metastatic lesion in heart was found. Myocardium was infiltrated with atypical haemopoietic cells.

Among congenital heart disease, we found 1 case of Tetralogy of Fallot in 33 year old male patient. Grossly, weight of heart was 550 grams. Pulmonary artery diameter was 1.2 cm and there was presence of overriding aorta and ventricular septal defect. There was no specific cardiovascular pathology in 22 cases (21 %) in present study.

CONCLUSION

From our study we conclude that atherosclerotic coronary artery disease is the most common heart disease responsible for the death in India. Incidence of atherosclerosis is more in males than females. There is importance of cardiovascular risk factors screening from third decade. Second most common heart disease was hypertensive heart disease. As this study is difficult to do in living subject, best possible way is to work in autopsy study. Histopathological studies provide better understanding of heart lesions.

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