Original Research Article

Autopsy profile of sudden cardiac deaths reported in Anantnag district of Jammu and Kashmir

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Abstract

Background: Cardiovascular disease is the most common cause of deaths in India, it is the leading cause of deaths in men between 20-65 years of age. Zipes and wellens estimate that up to 80% of individuals dying suddenly of cardiac disease die of coronary artery disease. There is a circadian variation in the incidence in the early morning. **Materials and Methods:** 77 cases of sudden cardiac death brought for autopsy. All cases of sudden cardiac death brought for autopsy to the District Hospital Anantnag, Jammu and Kashmir during the year July 2014 to June 2019. Baseline data like age, sex, history of any previous illness, and a brief history of the case were collected from the requisition provided by the investigating officer. Details of the post-mortem findings were collected from the post-mortem certificate.. **Results:** These shows 62% of sudden cardiovascular deaths as males, 38% in females and 11% are of ages less than thirty (30) years. In this later age range males are 10% and females 1 %. **Conclusion:** These goes to say if one could have identified all risk factors and measures instituted most patients would have been saved from sudden death.
Key Words: Cardiovascular disease, post-mortem certificate, sudden death.

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INTRODUCTION

Cardiovascular disease is the most common cause of deaths in India, it is the leading cause of deaths in men between 20-65 years of age. Zipes and wellens estimate that up to 80% of individuals dying suddenly of cardiac disease die of coronary artery disease.[1] There is a circadian variation in the incidence in the early morning. Willich *et al* reported the peak incidence as between 7am and 9am (after discounting individuals found dead during this time), which was 70% higher than the average rate during the rest of the day.[2] The explanation was attributed to increased activity of the sympathetic nervous system, known to occur in morning, which may predispose to cardiac arrhythmias.[3] Sudden cardiovascular deaths is currently described as natural, unexpected death occurring within an hour of onset of final symptoms. If sudden cardiovascular deaths were to occur in the young, a systematic forensic autopsy including toxicological analysis must be done.[4] The toxicology is to exclude toxic causes and to determine any drug-related cardiomyopathy as cocaine or amphetamine induced cardiomyopathy which could lead to sudden death. Also cardiac toxicity of anabolic steroid abuse must also be taken into account.[5] It is also well known that coronary artery disease (CAD) including acute myocardial infarction, recent thrombosis and high grade coronary stenosis (>75%) due to atheroma is still major cause of death in people of 35 years. Pulmonary diseases are usually caused by pulmonary embolism and asthmatic attack. When neurological signs are elucidated it represents cerebral haemorrhages and epilepsy. There is now frequency of right ventricular cardiomyopathy (RVC in 70% of sudden death between ages of 20-40 years

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in USA). The new forms of RVC with minimal gross anomalies and other exclusive left ventricle involvement have been described. These have shown that left ventricle and interventricular septum involvement has a poor prognosis. Clinically, it has been shown also that patients with left ventricular hypertrophy (LVH) have significantly more premature contractions than normal individuals or those with hypertension without (LVH). In most cases, sudden cardiovascular deaths have been recorded from coronary artherosclerosis.[6] In study of 500 consecutive autopsies of ages 20-99 years Dimaio *et al* found acute thrombosis in 13.4% as cause of death. The left coronary and its branches showed higher incidence of thrombosis when compared with right. Hence it is acceptable to see in all deaths due to coronary artherosclerosis severe artherosclerosis of the coronary vessels. However, this is obscured in hypertensive cardiovascular disease as this is lacking because of plaque formation resulting to thickening of the walls by artheriosclerotic deposits. In elderly the lumina are patent, vessels rigid, calcified tubes because of calcium deposits in vessel walls. In some others while epicardial coronary arteries are non-occluded, microscopic examination of myocardium shows severe occlusive dysplasia of the intramural coronary arteries.[7] The Objective Of The Study Was To Determine The Possible Association Between The Histopathological Changes Of The Coronary Atherosclerotic Lesions And The Risk Of Sudden Cardiac Death (SCD) And Acute Myocardial Infarction (AMI) Using Autopsy Cases reported in anantnag district of Jammu and Kashmir.

RESULTS

MATERIALS AND METHODS

Study Design

Retrospective case series study conducted in the Department of Forensic Medicine and Toxicology, Anantnag, Jammu and Kashmir during the year July 2014 to June 2019.

Sample Size

77 cases of sudden cardiac death brought for autopsy in District Hospital Anantnag, Jammu and Kashmir.

Source population

All cases of sudden cardiac death brought for autopsy to the District Hospital Anantnag Jammu and Kashmir during the year 2014 to 2019.

Inclusion Criteria

All autopsies in which death was due to sudden cardiac death were included in the study.

Exclusion Criteria

1. All unidentified bodies.
2. All decomposed bodies.

Data Collection

Baseline data like age, sex, history of any previous illness, and a brief history of the case were collected from the requisition provided by the investigating officer. Details of the post-mortem findings were collected from the post-mortem certificate.

Analysis

Data collected was entered in MS-Excel and analysed using SPSS version 15.

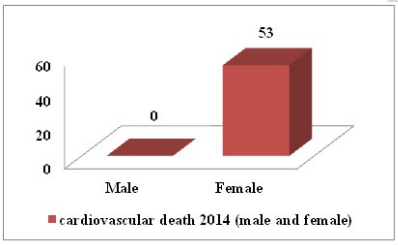
Table 1: CARDIOVASCULAR DEATH IN JULY 2014- JUNE 2019

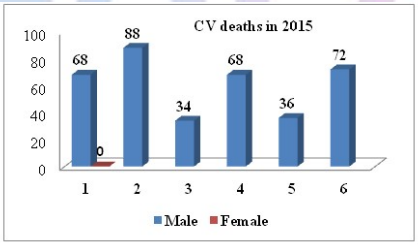
2014	2015	2016	2017	2018	2019
56	68	40	75	29	70
	88	45	50	70	65
	34	27	55	54	55
	36	27	55	25	60
	72	70	25	45	75
	36	40	33		49
	72	45	72		50
		27	25		48
		25	20		35
		89	50		68
		14	60		57
		Adult	25		60
		Adult	Adult		48
		54	53		63
		Adult	50		56
		18	22		54
		70			78
		40			64
					76
					72
					60
					72
					47

	45
	39
	40
	43
	44
	80
	76

Table 2: GENERAL OVERVIEW OF AGE DISTRIBUTION OF CARDIOVASCULAR DEATH FROM JULY 2014- JUNE 2019

2014		2015		2016		2017		2018		2019	
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	56	68	0	27	40	75	20	29	25	70	65
		88		45	40	50	55	70		55	60
		34		27	89	55		54		49	75
		68		70	14	55				35	50
		36		45		25				68	48
		72		27		50				57	60
				25		33				78	48
				54		72				64	63
				18		50				72	56
						25				45	56
						50				39	54
						60				40	76
						53				43	60
						25				44	72
						22				76	47
											80





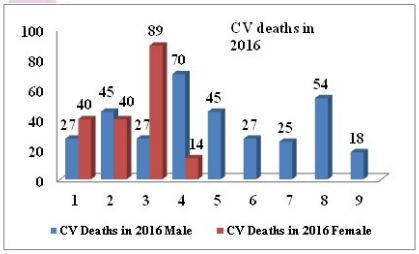
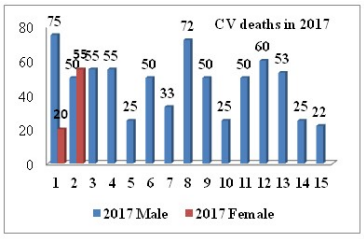
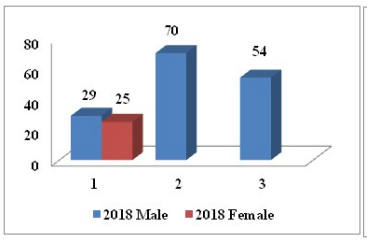


Figure 1: Cardiovascular deaths in 2014; **Figure 2:** Cardiovascular deaths in 2015; **Figure 3:** Cardiovascular deaths in 2016





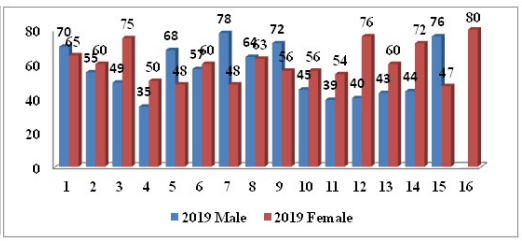


Figure 4: Cardiovascular deaths in 2017; **Figure 5:** Cardiovascular deaths in 2018; **Figure 6:** Cardiovascular deaths in 2019

DISCUSSION

Sudden death is currently described as natural unexpected death occurring within an hour of new symptoms. Most studies focused on cardiac causes of death because they are always cardiovascular related. This is because cardiac causes are leading cause of sudden death, as other causes are not well known since many such deaths are not autopsied.[8] In most of the hospitalized patients with a known history who died suddenly, autopsy revealed an enlarged heart with left ventricular hypertrophy and minimal coronary artherosclerosis. The mechanism of death in these cases is sudden cardiac arrhythmia most likely ventricular fibrillation. These have been seen clinically that patients with left ventricular hypertrophy have more ventricular premature contractions than normal individuals or ones with hypertension without left

ventricular hypertrophy. This observation agrees with our study that a significant number of individuals who die suddenly and unexpected with clinical history of hypertension have only left ventricular hypertrophy without severe artherosclerotic involvement of their coronary arteries. A few of our patient had ruptured berry aneurysms invariably at the apex. These led to haemorrhage into the subarachnoid spaces and in the substance of the brain. Death here is due to generalized vasospasm triggered by the subarachnoid haemorrhage, with resultant ischaemic injury to the brain. In our study, 62% of deaths recorded were males, 38% females and 30% below the age of 30 years. In this age range still male were 10% and 1% are female. This shows the great preponderance of the cases that occurred were in males. Also most of the male middle aged as seen in the graphical representation died as a result of sudden death rupture of cerebral vessels leading to intracerebral haemorrhage. This is supported by Vincent dimaio *et al* when he said that intracerebral haemorrhages are more common in males and in negroid race than in whites probably due to greater incidence of hypertension.[9] The sudden death seen in the young is up most important despite our detailed forensic autopsy though lacking forensic toxicological analysis. Indeed, toxicology is important as to exclude toxic causes and help to determine drug related cardiomyopathy as cocaine or amphetamine-induced cardiomyopathy which can give sudden death. Hair testing is needed even if no or low levels of drug are detected in blood, in order to show a past history of drug abuse. These result must be compared with a known cardiac pathologic findings suggestive of cocaine or amphetamine cardiac toxicity, as association of microfocal fibrosis, contraction band necrosis and cardiomyocyte hypertrophy. Also cardiac toxicity of anabolic steroids must be checked.[10]

CONCLUSION

In conclusion, the progress in autopsy diagnosis of sudden death depends respectively on the following criteria- scene investigation, number and quality of autopsies and use of complementary technique especially molecular biology. Indeed, molecular autopsy is now needed to overcome autopsy diagnosis difficulties, although molecular investigation is not yet available in daily work of forensic pathologist. However, improvement needs to be done in all the new discovered methods of clinical, biological or imaging diagnosis used in investigating sudden deaths. A major problem for cardiologist will be to identify assymptomatic patients at high risk of sudden death as to avoid early manifestation of the diseases. That is to develop preventive strategies as to use of anti-arryhthmic agents or implantable cardioverterdefribillator, and the ability to identify the incidence, causes and circumstances surrounding the sudden death must be well known and provided by the forensic pathologist.

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