

# Epidemiology of sudden unexpected natural medicolegal deaths in Jammu region of union territory of Jammu and Kashmir



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## ABSTRACT

**Background:** Medicolegal autopsies are conducted in cases of sudden and unexpected deaths primarily to establish the cause of death in cases where such deaths have occurred in apparently healthy individuals under suspicious circumstances. **Aims and Objectives:** The current study was done to analyze autopsies of individuals dying of sudden death. **Materials and Methods:** A retrospective, case record study on cases of natural deaths brought for medicolegal autopsies to the mortuary was studied. The findings were statistically analyzed using descriptive statistics to find out the mean, percentage, and frequencies. **Results:** In the present study, a total of 70 sudden unexpected natural medicolegal deaths were studied. Male (92.86%) was more than females (7.14%) and male: female ratio was 13:1. The most common age group was 51–60 years (40%) followed by 41–50 years (35.71%). System-wise cardiovascular system involvement was most common (54.29%), followed by respiratory system (14.29%), central nervous system (10%), gastrointestinal tract (8.57%), genitourinary system (2.86%), septicemia (2.86%), and miscellaneous (7.14%) were noted. Coronary artery disease (51.43%) was most common disease noted, followed by tuberculosis (10%), intraventricular hemorrhage (10%), cirrhosis (7.14%), pneumonia/bronchiolitis (4.29%), cardiomyopathy (2.86%), septicemia (2.86%), ruptured ectopic pregnancy (1.43%), and chronic pyelonephritis (1.43%) were noted as cause of death. **Conclusion:** Cardiovascular disease accounts for the maximum number of sudden deaths, in which coronary artery disease is the main cause of sudden deaths.

**Key words:** Cardiovascular diseases; Coronary artery disease; Medicolegal autopsies; Sudden natural deaths

## INTRODUCTION

The most widely accepted definition of sudden death is a death which is not known to have been caused by any trauma, poisoning, or violent asphyxia, and where death occurs all on a sudden or within 24 h of the onset of terminal symptoms.<sup>1</sup> Sometimes sudden deaths occur in older individual and generally under circumstances which arouse no suspicion. However, such deaths in young people are likely to raise suspicion.

The cardiovascular system (CVS) is the primary cause of unexpected sudden death in people of all ages, and

sudden cardiac death is a clinical condition that accounts for more than half of all ischemic heart disease-related mortality.<sup>2</sup> Cerebrovascular accidents such as cerebral and subarachnoid hemorrhage, brain infarction, gastrointestinal disease, pulmonary disease, hepatic disease, and blood dyscrasias are among the other causes of sudden death.<sup>3-5</sup>

Medicolegal autopsies are frequently performed in cases of sudden and unexpected deaths, primarily to determine the cause of death in cases when such fatalities have occurred in otherwise healthy people under questionable circumstances. The present study was aimed to analyze

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autopsies of individuals dying of sudden death, to find out cause of death and any relation to medicolegal cause if any.

### Aims and objectives

The current study was done to analyze autopsies of individuals dying of sudden death.

## MATERIALS AND METHODS

A retrospective, case record study on cases of natural deaths brought for medicolegal autopsies to the mortuary of Government Medical College, Jammu, during the 3-year period from January 2017 to December 2019 was carried out. The Institutional Ethical Committee approval was taken.

Cases of natural deaths, age > 18 years, brought for medicolegal autopsies were studied.

Poisoning and trauma cases have been excluded.

The detailed case history, police records, hospital records, if available, and postmortem examination reports were studied. Age, sex, and external injuries present on the body, the cause of death and type of diseases causing the deaths were noted. Circumstances surrounding the deaths and information regarding lifestyle were also noted.

The findings were statistically analyzed using descriptive statistics to find out the mean, percentage, and frequencies.

## RESULTS

In the present study, a total of 70 sudden unexpected natural medicolegal deaths were studied. Male (92.86%) was more than females (7.14%) and male: female ratio was 13:1. The most common age group was 51–60 years (40%) followed by 41–50 years (35.71%) (Table 1).

System-wise CVS involvement was most common (54.29%), followed by respiratory system (14.29%), central nervous system (10%), gastrointestinal tract (8.57%), genitourinary system (2.86%), septicemia (2.86%), and

**Table 1: Age-wise and sex-wise distribution of natural deaths**

Age group (years)	Males (%)	Females (%)	Total (%)
19–30	2 (2.86)	1 (1.43)	3 (4.29)
31–40	6 (8.57)	0	6 (8.57)
41–50	24 (34.29)	1 (1.43)	25 (35.71)
51–60	26 (37.14)	2 (2.86)	28 (40)
61–70	4 (5.71)	1 (1.43)	5 (7.14)
>70	3 (4.29)	0	3 (4.29)
Total	65 (92.86)	5 (7.14)	70

miscellaneous (7.14%) were noted. Coronary artery disease (51.43%) was most common disease noted, followed by tuberculosis (10%), intraventricular hemorrhage (10%), cirrhosis (7.14%), pneumonia/bronchiolitis (4.29%), cardiomyopathy (2.86%), septicemia (2.86%), ruptured ectopic pregnancy (1.43%), and chronic pyelonephritis (1.43%) were noted as cause of death (Table 2).

## DISCUSSION

Establishing the cause of death in sudden death cases is a difficult task for an autopsy surgeon since the goal of a medicolegal autopsy in a sudden death case is to ascertain whether violence or poisoning had a role in the death.

Sudden deaths can be classified into two groups where autopsy of death reveals a lesion, which is not compatible with life because of its nature, site, and extent, or where some lesion is found at autopsy which may have caused death, but which can also be compatible with continued life, for example, arteriosclerosis of coronary arteries. The failure to find any other causes of death in these circumstances provides presumptive evidence that the lesion was the cause of death, but it is not conclusive proof. As a result, in such cases, the clinical history is frequently useful in pinpointing the probable cause of death.

One of the most common challenges in sudden unexpected deaths, whether cardiac or non-cardiac, is the lack of precision in collecting various factors within the 24 h period preceding death.<sup>6</sup>

Raof et al.,<sup>7</sup> studied 121 medicolegal autopsies of natural deaths, involving 110 males and 11 females with a M: F ratio of 10:1. The highest number of cases was observed in the age group of 31–50 years (57.85%). Interestingly,

**Table 2: Causes of sudden natural deaths (system wise)**

System affected disease	No. of cases (%)	Total (%)
Cardiovascular system (CVS)		38 (54.29)
Coronary artery disease	36 (51.43)	
Cardiomyopathy	2 (2.86)	
Respiratory system		10 (14.29)
Tuberculosis	7 (10)	
Pneumonia/bronchiolitis	3 (4.29)	
Central nervous system (CNS)		7 (10)
Intraventricular hemorrhage	7 (10)	
Gastrointestinal tract (GIT)		6 (8.57)
Cirrhosis	5 (7.14)	
Duodenal perforation	1 (1.43)	
Genitourinary system		2 (2.86)
Ruptured ectopic pregnancy	1 (1.43)	
Chronic pyelonephritis	1 (1.43)	
Miscellaneous (STARVATION)	5 (7.14)	5 (7.14)
Septicemia	2 (2.86)	2 (2.86)

66.9% of the cases had external injuries which were trivial in nature. The most common cause of death was CVS diseases (41.32%), of which 90% were due to coronary insufficiency. They noted that CVS disease, especially coronary insufficiency, is a common cause of sudden natural deaths in this part of the country. Similar findings were noted in the present study.

Neha and Panigrahi<sup>8</sup> studied 124 cases of sudden death at North Delhi, the main etiology of sudden death was cardiovascular disease. The highest numbers of sudden death were in old age group. Male patients died from sudden death at a higher rate, which could be due to their various comorbidities. Sudden deaths were more common in the winter and early in the morning. There are certain cases of unexplained abrupt death that is autopsy negative. The leading causes of sudden natural death were cardiovascular, respiratory, and central nervous system problems. The surge in pollution and poor air quality in Delhi during the winter season may be to blame for seasonal variations in sudden mortality, particularly from respiratory causes.

Khetre and Umbare<sup>9</sup> studied 125 cases of SND. Maximum, that is, 32.8% of cases were of cardiovascular causes followed by 25.6% due to respiratory causes. About 13.6% of cases were of central nervous causes, 16% were of gastrointestinal causes, 4% due to genitourinary causes, and 8% were of miscellaneous causes. Out of cardiovascular causes, coronary artery disease contributed for 80.4% of cases.

Prasanna and Vanaja<sup>10</sup> studied 52 cases of sudden cardiac deaths, maximum numbers of deaths were in the age group of 41–50 years (46.2%), males (92%) outnumbered the females (8%) in being victims of coronary artery disease. Double-vessel disease was seen in more than half of the cases (57.6%) followed by single-vessel disease (34.6%) and triple-vessel disease (7.6%). Atheromatous type of occlusion (77%) was seen in majority of cases followed by thrombosis (19.2%) and both atheromatous and thrombosis were seen in few cases (3.8%). Majority of the victims were obese (75%). In near half of the deaths, smoking and drinking were the lethal mix of behaviors that contributed to coronary artery disease (48.1%).

Studies have shown that ischemic heart diseases are the leading causes of sudden natural deaths. The most common is cardiac ischemia, which develops as a consequence of coronary atherosclerosis.<sup>11</sup> The most common cause of sudden natural death is connected to CVS and, in turn, followed by respiratory, cerebrovascular, and digestive and urogenital systems.<sup>12</sup>

Majority of the sudden natural deaths were due to the diseases of CVS, as observed by Bhagora *et al.*,<sup>3</sup> (59.18%), Sapate *et al.*,<sup>4</sup> (55%), and Sreedevi and Sreelekshmi<sup>5</sup> (66%) with coronary artery disease in 46.82%, 41%, and 81.8%, respectively.

Women of child-bearing age in India contribute 48.9% of total population.<sup>13</sup> In the developing countries, pregnancy and childbirth-related complications are the leading cause of disability and death among women of reproductive age.<sup>14</sup> The worldwide incidence of sudden cardiac death is difficult to estimate because its variable prevalence of coronary heart disease in different countries. Diabetes mellitus, hypertension, hyperlipidemia, and smoking are other important risk factors for atherosclerosis, ischemic heart disease, and sudden death.

### Limitations of the study

Limitation of the study was retrospective nature of study limits evaluation in details.

## CONCLUSION

Cardiovascular disease accounts for the maximum number of sudden deaths, in which coronary artery disease is the main cause of sudden deaths. Sudden natural deaths were associated with hypertension, diabetes, alcohol, and smoking which are modifiable factors and can help to reduce sudden deaths.

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