

Sudden Natural Deaths in Medicolegal Cases- An Autopsy Based Study

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Abstract

Objective: The investigation of sudden or unexpected death has got immense importance where the vital objective of the investigation is to exclude an unnatural cause of death.

Method: Data of 50 cases of sudden unexpected death brought for medicolegal autopsy at J.L.N.M.C.H Bhagalpur in the year 2015 were studied and information were collected from the postmortem records. Data was entered in the proforma. The histopathological examination findings of relevant cases were studied.

Results: Most of the sudden deaths were in the middle age group i.e. 31-50 years of age. Male predominates female among all sudden deaths with male: female ratio 1:0.178. Cardiovascular causes were the leading causes of death followed by respiratory causes among all sudden deaths. Death due to coronary artery disease amounts to almost half of all sudden deaths (42.85%).

Conclusion: From the cases of natural disease brought for medicolegal autopsy it was found that majority of cases were due to cardiac causes. Males were most commonly affected. Sixth decade of age had most cases followed by fourth decade. Pancreatitis, steatohepatitis, rupture of cerebral aneurysm and ectopic pregnancy were rare causes of sudden death encountered in this study. It was observed that physical and mental injury can precipitate or accelerates death in myocardial infarction..

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I. Introduction

Sudden death is the death which is sudden or unexpected in a person not known to have been suffering from any dangerous disease, injury or poisoning is found dead or dies within 24 hours after the onset of terminal. Causes of sudden natural deaths are mainly represented by cardio-vascular diseases and in turn followed by respiratory, neurological, digestive, infectious and genito-urinary conditions. Ischaemic heart disease is the leading cause of sudden natural death in developed countries of Europe and America, but the incidence is low in developing countries. Autopsy studies in India have shown that the most common cause of sudden natural death was cardio-vascular disease and that the complications of hypertension accounted for most cases. The study of sudden death gives systemic view of differential diagnosis of cause of death and to make a logical choice of most likely cause will help to improve the mortality statistics, assist the legal authorities and satisfy the bereaved relatives. The aim of this study was to determine the causes of sudden natural death by a retrospective analysis of 50 autopsies carried out on patients who died of medical diseases within a seven-year period.

II. Material & Method

The present study has been conducted in the Department of Forensic Medicine J.L.N. Medical College & Hospital, Bhagalpur during the period of 1st January 2015 to 31st December 2015. The material for the present study consists of the cases where the deceased had died suddenly and or unexpectedly and had been subjected to medico-legal autopsy. The criteria for selection of cases was as per definition of sudden death - '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 of a sudden or within 24 hrs of the onset of the terminal symptoms'. A careful autopsy examination was carried out in every case and the whole organ or pieces of organ showing gross pathologic changes were preserved for histopathological examination. After the receipt of histopathological report, final opinion as to cause of death was given. The findings were recorded and analysed statistically..

III. Result

Out of 50 cases studied, 44 persons were males and others females. In 56.81% of males, atherosclerotic occlusive coronary artery disease was the cause of death. Among females 33% died of myocardial infarction and other causes constituted tuberculosis, rupture of ectopic pregnancy, hypoxic encephalopathy and septicemia. While considering the systemic distribution of cause of death the cardiovascular system was found to be most commonly affected, 33 cases (66%) followed by respiratory system 7 cases (14%). In 4 (8%) cases gastrointestinal system was affected. In Two cases (4%) central nervous system was affected and others were generalized infection, which constituted 2 cases (4%). (Table 1) Out of 33 cases observed in cardiovascular system the commonest cause being the atherosclerotic occlusive coronary artery diseases involving 27 cases (81.81%) in which the predominant involvement was seen in left anterior descending artery 21 cases (77.77%) followed by right coronary artery, 4 cases (14.8) and left circumflex coronary artery, 2 cases (7.4%). Coronary artery thrombosis and myocarditis constituted two cases (6.6%) each. One among the twenty seven persons of occlusive coronary artery disease showed intracranial bleed and 8 persons had evidence of previous myocardial infarction. One person among the coronary artery thrombosis cases was suffering from pneumonia. of gastro oesophageal junction, myocarditis and steatohepatitis. In one case of myocardial infarction, there was history of attack by dog. In 3 cases, there was history of mental harassment and in 1 case there was history of physical assault. Persons having normal basal metabolic index was most commonly affected 31 cases (62%) followed by overweight persons 10 cases (20%). Very severely underweight, one among them was suffering from valvular heart disease and the other was found suffering from tuberculosis (Table 3)

Respiratory system was involved next to the cardiovascular system in which most common cause was pneumonia, which was found in 3 cases (42.86%). In gastrointestinal system 50% were due to pancreatitis. In one person among two with pancreatitis had evidence of previous myocardial infarction. Alcoholic steatohepatitis (Picture 1) was found to be a rare cause of unexpected natural death. In central nervous system involvement, hypoxic encephalopathy and rupture of cerebral artery aneurysm were found as causes of death. In genitourinary system rupture of ectopic pregnancy and postpartum haemorrhage were found to be the causes of death. Generalised infection were found in two cases (4%). Majority of persons were in their sixth decade, 18 cases (36%) (Figure 2). Among them 83% had atherosclerotic coronary artery disease and others had valvular heart disease, squamous cell carcinoma and pneumonia. Out of 50 cases, 24 (48%) were instantaneous deaths (among them 14 cases were due to myocardial infarction) (58.33%). (Table 2). Others are due to acute haemorrhagic pancreatitis, valvular heart disease, squamous cell carcinoma of larynx, pneumonia, Cardiomyopathy, Rupture of aneurysm, carcinoma patients’.

Figure 1. System wise Distribution of cases in sudden death

Organ System	Cause of Death	No. of Cases (Percentage)
Involved (n) %		n (%)
	Atherosclerotic occlusive coronary artery disease	27 (81.8)
Cardiovascular System (n=33) 66%	Coronary artery thrombosis	2 (6.1)
	Cardiomyopathy	1 (3.0)
	Valvular heart disease	1 (3.0)
	Myocarditis	2 (6.1)
	Pneumonia	3 (42.9)
Respiratory System (n=7) 14%	Tuberculosis	2 (28.6)
	Squamous cell carcinoma lung	1 (14.3)
	Carcinoma larynx	1 (14.3)

	Gastro	
Gastrointestinal	esophageal	1 (25.0)
	adenocarcinoma	
System		
	Pancreatitis	2 (50.0)
(n=4) 8%	Alcoholic	1 (25.0)
	Steatohepatitis	
	Hypoxic	
	encephalopathy	1 (50.0)
Central Nervous	with nerve	
System	disorder	
(n=2) 4%		
	Aneurysmal	
	rupture of	1 (50.0)
	cerebral artery	

Period of Survival	No. of Cases	Percentage
Instantaneous	24	48
Minutes	9	18
Hours	17	34
Total	50	100

Table 2. Distribution of Case with Period of Survival

IV. Discussion

The term "sudden" has no agreed universal definition. In the material for the various studies, the duration of the death process has ranged from 1-24 hours, but it is difficult to determine exactly how long the fatal symptoms have been present, as death often occurs before the victim reaches hospital, in such circumstances no data on the symptoms are available for want of eye witnesses. In the present study majority of sudden death cases were observed in age group of 51-60 year, which was similar with various studies, like Azmak et al 50-59 years Rao D et al 56-65 years Udnoon Jtta et al 46-60 year. Although there are numerous causes of sudden death, cardiovascular causes are the principle cause among sudden death in the present study. Out of 50 cases of sudden death, 33 cases (66%) were due to cardiovascular causes, of which 28 were male and 5 were female. Dr. K.S.Narayan Reddy⁸ and Apurba Nandy⁹ stated that most of the deaths were due to cardiovascular causes about 45-50%. Similar findings were seen in the study of Kuller Lewis et al (49.50%), Anders Siboni et al (46.20%), Di Maio V.J.M. et al¹¹ (60.9%), T. Sarkoija et al (61%), James Luke et al (38%)¹², Ivar Nordrum et al (69.15%), Anthony Thomas et al (69.5%). amounting to 42.85% with male predominance, which is consistent with previous studies. In the present study, out of 50 cases of sudden deaths, 7 cases (14%) were due to respiratory causes. The important among respiratory causes were Pulmonary Koch's (28%), and pneumonia (42%). This finding of deaths due to respiratory causes are comparatively higher as compared to other studies. This may be due to cases of pulmonary Koch's and pneumonia are higher in our studies. This may be due to lower economic status, increased pollution and treatment defaulter in pulmonary Koch's patients.

V. Conclusion

From the descriptive study of natural disease brought for medicolegal autopsy it was found that majority of cases were due to cardiac causes with predominance of atherosclerotic occlusive coronary artery disease affecting anterior descending branch of left coronary artery. Males were most commonly affected and sixth decade of age and had most cases followed by fourth decade. Alcoholic steatohepatitis was observed as a rare unexpected cause of sudden death in this study. It was observed that physical and mental injury can precipitate sudden death by myocardial infarction. It was observed that proportion of cases with normal BMI was high among MI category than non-MI category, but this was not statistically significant results of this study are in favour of using the cartilage technique in difficult cases..

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