

Study of Histopathological Analysis in Cases of Sudden Death

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ABSTRACT

Background: The incidences of sudden death (SD) are increasing day by day due to current life style and histopathology examination of the samples of the deceased is having a major role to confirm the diagnosis. **Objectives:** The current study was undertaken with the objective of understanding the role of histopathological analysis in cases of sudden death. **Method:** In this study, the cases of sudden death coming to the autopsy center of S.S.G. Hospital, Vadodara was selected and the routine organs were sent to the histopathological analysis and on the basis of gross and microscopic examination, the cause of death was determined. **Results:** In sudden death, occlusive coronary artery diseases were the main etiology in cardiovascular system followed by the acute myocardial infarction while pneumonia was common in cases of the respiratory involvement. **Conclusion:** The study of sudden death gives a 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.

Key-words: Sudden Death, Histopathology, Autopsy, Natural deaths.

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INTRODUCTION

Sudden death is a broad term meaning “death that occurs unexpectedly and from 1 to 24 hours after the onset of symptoms, with or without knowing pre-existing conditions”.¹ These deaths are usually most suspenseful in the practice of forensic medicine and the family demands the perfect cause of death as they are curious about the death happening suddenly. Most of the times poor coronaries are there to take the blame, but extensive research supported by adequate histo-pathological examination is the need of time. Hence, we have undertaken this study to analyze the role of histopathological examination in cases of sudden death.

MATERIAL & METHOD

This prospective and observational

study had been conducted in the department of Forensic Medicine and Toxicology, Medical College and S.S.G. Hospital, Baroda, Gujarat during the period of one year from 1st March 2013 to 28th February 2014. During this one year period 2240 autopsies were conducted and out of them 224 cases (10%) of sudden death were selected for the present study after taking informed written consent from the relatives.

Inclusion criteria: All the cases of death coming to us for medico-legal autopsy where death is said to be sudden or unexpected when the victim 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 symptoms were selected for the present study.

Exclusion criteria: All cases where death occurred either due to injury or poisoning or where the victims have died after 24 hours from the onset of symptoms with cases of putrefaction.

The detailed history about the incidence with a complete autopsy, examination was performed in all the cases and routine samples for histopathology including brain, lungs, heart, liver, spleen and kidneys were sent in 10% formalin solution for the histopathology examination, which was conducted in the pathology department of our institute. The gross and microscopic reports of histopathology examination were analyzed and compared with the observations of other authors.

RESULTS

Table-1: Distribution of Cases according to the Involvement of Body System

Body System Involved	No. of cases	%
Cardiovascular	149	54.38
Respiratory	63	23.00
Gastrointestinal	25	9.12
Central nervous	17	6.20
Genitourinary	4	1.46
Not Known	16	5.84

Table-1 showing distribution of sudden death cases, according to involvement of the body system in which majority of the sudden deaths were due to the diseases of cardiovascular system (54.38%) followed by diseases of respiratory system (23%). The diseases of the gastrointestinal system constituted 9.12% of the SD cases, while the diseases of central nervous system contributed 6.20% cases of SD and the least number (1.46%) of SD cases were contributed by the genitourinary system. In our study, we could not find any major pathology in 5.84% cases

Table-2: Distribution of Sudden Death Cases, according to Etiology

Classification	No. of cases	%
Diseases of Cardiovascular System		
Occlusive coronary artery diseases	82	29.93
Acute myocardial infarction	45	16.42
Valvular heart diseases	2	0.73
Cardiac tamponade	4	1.46
Hypertrophic cardiomyopathy	16	5.84
Diseases of Respiratory System		
Pneumonia	32	11.68
TB	14	5.11
Pulmonary Edema	10	3.65
Emphysema (COPD)	5	1.83
Asthma	2	0.73
Diseases of Gastro Intestinal System		
Cirrhosis	9	3.28
Fatty Liver	10	3.65
GI haemorrhage	1	0.36
Hepatitis	5	1.83
Diseases of Central Nervous System		
ICH	14	5.11
Epilepsy	2	0.73
Meningitis	1	0.36
Diseases of Genitourinary System		
Chronic Pyelonephritis	1	0.36
Arteriosclerosis and inflammation	3	1.10
Not opined	16	5.84

Table-2 shows the distribution of the SD cases, according to the etiology and it shows that in the majority of the cases occlusive coronary artery disease was the main etiology in cardiovascular system followed by the acute myocardial infarction while the hypertrophic cardiomyopathy was commonly observed in young adults. Pneumonia was the common etiology in cases of respiratory involvement, followed by tuberculosis of the lungs while intracerebral hemorrhages due to cerebral vascular accidents were found as a common etiology in nervous system involvement.

DISCUSSION

The results of our study were compared with previous studies and we have noticed that our observations are more or less similar to the other studies. In the present study, maximum deaths were related to diseases of the cardiovascular system constituting 54.38%, which is very well supported by the observations of other studies done by Di Maio et al (60.9%)²

and Puranik (56.4%) et al³ The other authors like Reddy⁴ and Nandy⁵ have also supported the contribution of cardiovascular system in about 45% cases of SD. Predominance to cardiovascular system could be explained by changing social concepts and way of living, food habits, high concentration of fatty foods in diet, physical and mental stress, lack of exercise with a sedentary lifestyle, high salt intake, ice-cream, bakery items, urbanization, industrialization and progressive excessive indulgence of younger age groups in predisposing factors like smoking and alcoholism. The higher incidences (83%) of cardiovascular disease were reported by Sarkioja et al⁶ in their study, which might be due to the inclusion of young and middle-aged persons only. However, much lower rates of cardiovascular diseases (23%) were also reported by Obiorah et al.⁷ In our study, we could not find any major pathology in 5.84% cases, which denotes that cases of negative autopsy and the incidences are also supported by others.^{4,5}

The present study shows that the occlusive coronary artery diseases (85%) was the most common reason leading to sudden death due to cardiovascular involvement, which is almost similar to the observations of Sarkioja (80.85%) et al,⁶ Nordrum (90.54%) et al⁸ and Di Maio (74%) et al.² In our study, we observed that recent myocardial infarction was seen in 18.12% cases of cardiovascular deaths, which is almost similar (21%) to the observations of Farb et al.⁹ The second common cause of sudden death was related to the respiratory system diseases (23%), which is very well supported by the findings (27.45%) of Yadhukul et al¹⁰ and Escoffery and Shirley et al (23%).¹¹ Lung diseases may be difficult to accept as a cause of sudden death in people who are not disabled by respiratory disease, but intermittent hypoxia may lead to

ventricular arrhythmias in these patients. Pneumonia constituted 50.79% of all respiratory deaths in our study, which is similar to the findings (52.8%) of Nordrum et al (8) and Obiorah et al (62.6%).⁷ The higher rate of deaths due to pneumonia may be attributable to a lack of education, lack of health care, exposure to the cold and inadequate nutrition. Sudden deaths due to pulmonary tuberculosis was 5.11%, which were more (3.1%) when compared to Kumar et al.¹² Lower socioeconomic status, social stigma and treatment default may be the reason for higher incidence of pulmonary tuberculosis in our study.

The third commonest cause of sudden death was related to GI system (9.12%), which is consistent with observations of Chaudhari et al (11.3%)¹³ and fatty liver was the commonest cause (40%) followed by Cirrhosis (36%) in cases of GI system involvement. The fourth common cause of sudden death was related to the central nervous system diseases (6.20%), which was almost similar to Chaudhari et al¹³ and intracerebral haemorrhage due to cerebral vascular accidents was the commonest cause of it.

CONCLUSION

The present study gives a systemic view of differential diagnosis of different causes of sudden death and to make a rational choice of most likely cause, which will help to improve the mortality and morbidity statistics and assists the legal authorities and satisfy the bereaved relatives. This study is particularly significant because it is the first to comprehensively analyze the histopathology examination reports in relation to sudden deaths in Vadodara, Gujarat.

Conflicts of Interest: None.

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