

SUDDEN AND UNEXPECTED NATURAL DEATHS - A FOUR-YEAR AUTOPSY REVIEW

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Abstract

Sudden and unexpected death is an indication for a medicolegal autopsy. The present study constitutes both Prospective and Retrospective periods and was undertaken in Department of Forensic-Medicine at R.M.C. Loni, India, between the period Jan 2000 to Dec. 2004, with the object of studying this untimely deaths. A total of 1176 Medico-Legal Autopsies were performed during this period. Sudden and Unexplained deaths formed 8.67% of Medico Legal Autopsies, with Male to Female ratio of 5.8:1. About 66.67% of cases were due to Cardiovascular Pathology, 27.45 % were due to Pulmonary Pathology. All natural deaths occurring within 24hours (WHO) from the onset of signs and symptoms were considered. Cases involving trauma, drugs, poison, asphyxia, decomposition were excluded.

Keywords: Sudden Death; Natural death

Introduction

A person likely to die in the opinion of treating physician in a particular manner dies otherwise, is also a sudden death to be investigated. When death occurs on the spot due to violent trauma are homicidal, suicidal or accidental nature, it is an exception to death which has occurred as sudden. When a person dies by any other causes and manner than expected, where a person suddenly dies in a manner otherwise than expected not only it's a natural death but consider "Sudden Death" to be thoroughly investigated. The cause of death is often evident from the postmortem findings. But in some of the cases the diagnosis is not obvious

All Natural deaths autopsies which were carried out in this study were deemed Medico-Legal because of sudden nature of occurrence and the Medical Officer unable to certify the Cause of death. In many instances during the course of Medicolegal work we come across various deaths where the onset was Unexpected in individuals who were having history of disease and in other situations death will be sudden in individuals who were seemingly fit. In all this cases the very sudden nature leads to suspicion of foul play and hence police were informed hence the case was booked under Medico Legal category to rule out any foul play and know the

cause of death. But there are instances where homicides were disguised as Natural deaths.

As such Pathological or Clinical Autopsy can never happen because it is next to impossible to convince the nearest relatives for the consent irrespective of the religion. Once a case of Sudden death is reported to the hospital (Casualty) the Doctor in charge of the Causality reports the matter to the Police, the police in turn registers it as UNNATURAL and orders for the autopsy

The Size of the population limited to the jurisdiction to this autopsy study is around 4-5 lakhs. The group involved individuals of all age group, Sex, religion, caste and Nationality.

Materials and Methods

All autopsies were performed in the Department of Forensic Medicine between Jan 2000 to Dec. 2004. The period of study between Jan 2000 to Dec 2002 was retrospective and the period from Jan 2003 to Dec 2004 was Prospective studies. All clinical data were collected for admitted case; circumstances surrounding the death were analyzed as per the police report. In the present study the cases were chosen as per the definition of sudden deaths occurring within 24hr from the onset of

signs and symptoms. Deaths from non medical causes were excluded.

The total number of Autopsies of Sudden and unexpected deaths performed were 102 cases. All cases were from P.R.H. which were termed medico legal.66 were treated 36 were Brought in Dead to Hospital. It included deaths within all age groups. All cases with drug, poison, trauma, decomposition have been excluded. sex, age, circumstances of death, causes of death reported in 102 cases.

Complete forensic autopsies were performed in every case with relevant histopathological examinations in all cases. The tissue were preserved in 10% Formal saline, thickness of 3-5mm was kept for fast and better fixation and stained with Haematoxylin and Eosin. Toxicological analyses were carried out in all cases to rule out poisonings. All studies and Autopsy data review were performed with strict confidentiality and in strict accordance with the university ethical considerations. . Hence on Histopathology, gross examination, Hospital details, Circumstantial and Police reports the Cause of Death was inferred.

Observations

The mean age of the studied population was 35yrs. sudden and unexpected deaths amounted to 8.67% of medico legal autopsies. Male to female rations was 5.8:1. Maximum incidence of sudden and unexpected deaths was reported above 35 yrs of age, with peak incidence between 45-65 years. Cardiac pathology contributed 66.67% to major cause of sudden and unexpected deaths.

Table No. 1: Causes of Sudden Death in 102 cases

Causes	No	Percentage
Cardiovascular	68	66.67%
Pulmonary	28	27.45%
Neurological	02	1.96%
Others	04	2.94%

Distribution of Medico Legal Postmortem Examinations during the period Jan 2000 to Dec 2004:

Burns	178
Drowning	56
Hanging	68
Fall from height	08
Insecticide consumption	286
Snake bite	64
Homicides	28
Firearm injuries	02
Infanticides	03
Sudden & Natural Death	102
Road Traffic Collision	381
Total	1176

Table No. 2: Causes of Sudden Death

Causes	< 35yrs	>35 yrs
Cardiovascular	09	59
Pulmonary	07	21
Neurological	01	01
Others causes	01	03
Total	18	84

Table No. 3: Gender and age Distribution:

Age Group (Yrs.)	Male	Female
5 – 15	-	01
16 – 25	02	02
26 – 35	07	02
36 – 45	16	02
46 – 55	21	02
56 – 65	32	06
66 – 75	07	02
Total 85	17	

Table No. 4: Gender distribution of Causes:

Causes	Jan 2000 to Jan 2004	
	Male	Female
Cardiovascular	60	08
Pulmonary	21	07
Neurological	02	-
Miscellaneous	03	01
Total Percentage	82.76%	17.24%

Table No. 5:

CARDIOVASCULAR CAUSES	68
Left Coronary artery thrombosis	41
Hypertrophic Cardiomyopathy	02
Rheumatic Heart Disease	06
Mitral Stenosis	04
Mitral Valve Prolapse	01
Cardiac aneurysm	02
Right Atrial Myxoma	01
(Myomalacia cordis) Myocardial Infarction	04
Right Coronary Thrombosis	06
Left Circumflex	00
Dilated Cardiomyopathy	01

Table No. 6

PULMONARY CAUSES	28
Aspiration of Food materials / Acute	02
Pulmonary Edema	
Pneumonia	05
Pulmonary Embolism	05
COPD	11
Tuberculosis	05

Table No. 7:

NEUROLOGICAL CAUSES	02
Epilepsy	01
Glio-blastoma multiforme	01

Table No. 8:

Miscellaneous	04
Viral hepatitis	01
Pancreatitis	02
Alcoholic Liver disease	01

Discussion

As the definition of sudden death varies, it is difficult task to compare one set of published data with another. Death from natural causes in which the interval between onset of signs and symptoms and death was not more than 24 hours were regarded as sudden deaths [1,2,3]. The longer the delay between the onset of symptoms and the death the more are the causes of death. It's by definition natural and it excludes all deaths due to poison, trauma. Various workers in this field have given different definitions of sudden and unexpected

death. Although sudden death is a relative concept, this concept is currently described as unexpected death occurring within one hour of new symptoms⁴. If the patient died instantaneously in presence of witness or died while asleep, their death was classified as Sudden. Adelson and Hoffman(1961) limited the time for two hours. But in the present study all the Natural deaths occurring within 24 hours from the onset of signs and symptoms were considered as sudden and unexpected deaths.

Despite this heterogeneity most of the series showed that the majority of cases of sudden and unexpected deaths were secondary to cardiovascular pathology (CVS)^{5,6,7} and involved mostly Coronary artery. Table no.02 shows various causes of death related to Cardiovascular system. Table no.01 shows the systems involved in sudden deaths. There is a wide variability being quoted as from 77.7% to 90%,⁸ of all Sudden and Unexpected deaths, The present study observations are in close to the similar observations..Deaths due to Respiratory system comprised only 10-15%, which are again similar to the present study which constituted 17.24%, Table no.06 showed various causes of death related to Respiratory system In the present study of the 102 cases of sudden and unexpected deaths 66.67% (n=68) of the cases constituted CVS Pathology of which 60.29% (n=41) were due to LAD [left anterior descending coronary artery] involvement and the remaining cases were due to other cardiac causes. Of the 102 cases 27.45% (n=28) cases were secondary to pulmonary pathology, this was similar to the observations made by Pentilla et al [10].

Hoon and Balasubramanian (11) reported that LAD was the cause of death in 89% of 'Brought in Dead' cases and 85% of those who died within 2hrs of arriving at hospital as an Emergency, the present study is also matching with it comprising 81.8% (n=41) of LAD involvement in Brought in Dead cases. Table no.02 showed the relationship of Sudden death according to age groups. The maximum incidence of Sudden Deaths were (n=74) reported in individuals above 35years of age

with peak incidence between the age group 45-65 years (n-51). The least affected age group was between 5-15 years (n-01). Males constituted 82.76% (Table no.03 and 04) against

Females 17.24%, which was similar to observation made by Copeland [12].

Table 9: Showing Causes in relation to age distribution.

Causes	5-15 yrs	16-25 yrs	26-35 yrs	36-45 yrs	46-55 yrs	56-65 yrs	66-75 yrs	Total
Left Coronary artery Occlusion	-	-	-	02	14	21	04	41
Hypertrophic Cardiomyopathy	-	02	-	-	-	-	-	02
Rheumatic Heart Disease	-	-	05	01	-	-	-	06
Mitral Stenosis	-	-	-	02	01	01	-	04
Mitral Valve Prolapse	-	-	-	-	-	-	01	01
Cardiac Aneurysm	-	-	-	-	-	01	01	02
Right Atrial Myxoma	-	01	-	-	-	-	-	01
Myocardial Infarction (Cardiac Rupture)	-	-	-	-	02	01	01	04
Right Coronary occlusion	-	-	-	-	02	03	01	06
Left Circumflex	-	-	-	-	-	-	-	-
Dilated Cardiomyopathy	-	-	-	01	-	-	-	01
Aspiration Pneumonia	01	-	01	-	-	-	-	02
Pneumonia	-	-	-	02	01	02	01	05
Pulmonary Embolism	-	-	-	03	-	02	-	05
COPD	-	-	01	03	02	05	-	11
Tuberculosis	-	01	01	02	-	-	-	05
Alcoholic Chirrosis	-	-	-	-	01	-	-	01
Viral Hepatitis	-	-	-	01	-	-	-	01
Pancreatitis	-	-	-	-	-	02	-	02
Glioma	-	-	-	01	-	-	-	01
Epilepsy	-	-	01	-	-	-	-	01

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