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Original Research Article

Sudden natural deaths autopsies-An analytical study

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ABSTRACT

Introduction: Sudden Natural Deaths are Not Uncommon during Forensic Practice. It is always essential to Analyse the Different Type of Sudden Natural Deaths so as to understand the Prevalence of Disease process in a Region.

Materials & Methods: This retrospective study was carried out at TOMCH&RC, Bangalore during the period 2017-2002. All Autopsy Reports during the Period were closely Documented & Analysed.

Aims & Objectives: To study the Contribution of Organ System to Mortality. To study the Age & Se Group affected by Sudden Death in the Region.

Results: Most of the sudden deaths belonged to the age group 41-50 years. Sex Ratio of male to female ratio 16.3:1. Cardiovascular Pathology Contributed to 38.47% of Deaths .Central Nervous System contributed to only 3.84% Fatality. Hepatobiliary System was not known to have contributed to Death in this Study.

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1. Introduction

Death is said to be sudden or unexpected when 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 illness (WHO). Some authors limit sudden deaths as those occurring instantaneously or within one hour of onset of symptoms. Emphasis is placed more on the unexpected character, rather than suddenness of death. Natural death means that the death was caused entirely by the disease, and the trauma or poison did not play any part in bringing it about.¹ The study of sudden death helps in establishing the precise causes of death and enable in assisting the legal authorities in detection of crime, improve the mortality statistical data and pacify the bereaved and aggrieved relatives where the medical negligence was the sufficient ground for legal proceedings.² The incidence is approximately 10 percent of all deaths.

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No period in life is exempt.¹ The Size of the population limited to the jurisdiction,Attibele, Bangalore Rural district of Karnataka state in India , to this autopsy study is around 1-1.5 lakhs. The group involved individuals of all age group, Sex, religion, caste and Nationality.

In the present study analysis of all the sudden deaths referred to Forensic Medicine Department of The Oxford Medical College, Bangalore was done in order to understand the prevalence of disease process responsible for the death of the individual.

2. Aims and Objectives

1. To Study the Contribution of Organs System to Mortality.
2. To Study the Age & Sec Group involvement in Sudden Deaths.
3. To understand the Co Morbid Factors contributing to the Sudden Deaths.

Table 1:

Age (years)	Male deaths	Female deaths	Total deaths
1-10	-	-	0
11-20	-	-	0
21-30	7	-	7 (13.5%)
31-40	10	1	11(21.15%)
41-50	20	1	21(40.38%)
51-60	5	-	5(9.61%)
61-70	2	2	4(7.69%)
71-80	3	-	3(5.57%)
81-90	1	-	1(1.92%)
Total (%)	48(92.3%)	4(7.69%)	52(100%)

Table 2: Systems affected

System affected	Male deaths	Female deaths	Total deaths	Percentage
Central Nervous System	01		01	3.84%
Cardio Vascular System	34	02	36	69.23%
Gastro Intestinal Tract	02	-	02	3.85%
Respiratory System	10	02	12	23.07%
Hepatobiliary System	-	-	-	0%
Reticulo Endothelial system	01	-	01	1.9%

Table 3: Showing diseases and sex-wise distribution of cases

System & diseases	Male deaths	Female deaths	Total deaths
Central Nervous System			
Meningitis	-		
Epilepsy	-	01	01
Cardio Vascular System			
Acute Myocardial Infarction	18	01	19
Congestive cardiac failure	02		02
Chronic ischemic heart disease	07	01	08
Cardiac arrhythmia	01		01
Malignant hypertension	01		01
Cardiac insufficiency/Tumour	02		02
Cardiac arrest	03		03
Gastro Intestinal Tract			
Acute Hemorrhagic pancreatitis	001		01
Eosophageal varices rupture	01		01
Chemical peritonitis due to acid peptic disease leading to perforation	00		00
Respirator System			
Bronchopulmonary pneumonia	02	00	02
Diffuse alveolar damage	01		01
Acute respiratory Distress Syndrome	03		03
Plueritis	00		00
Chronic obstructive pulmonary disorder	02	02	04
Lobar pneumonia	01		01
Acute trachea bronchitis	01		01
Reticulo Endothelial system- 01[1.9%]			
Septicemia/Infections	01	-	01
Total	49	03	52

Table 4: Indicating CNS pathology

System	Diseases	Co-morbid condition
Central Nervous System	Epilepsy	Pulmonary edema
	Meningitis	General congestion
		-

Table 5: Indicating gastro intestinal system pathology

System	Diseases	Co-morbid condition
Gastro Intestinal Tract	Eosophageal varices rupture	Fatty liver
	Acute Hemorrhagic pancreatitis	Portal hypertension
	Chemical peritonitis due to acid peptic disease leading to perforation	Chronic alcoholism Chronic alcoholism

Table 6: Indicating respiratory system pathology

System	Diseases	Co-morbid condition
Respiratory System	Bronchopulmonary pneumonia	Anemia
		Chronic ischemic heart disease
		Generalised muscular atrophy
		Sepsis
		Rheumatic heart disease
		Hypertension
		Diabetes mellitus
		Pleural effusion
		Malnutrient deficiency
		Pyelonephritis
		Hepatomegaly
		Fatty liver
Cardiomegaly		
Cardiac hypertrophy		
Chronic gastritis		
Chronic alcoholism		
ascites		
Viral etiology		
septicemia		
Aplastic anemia		
Pulmonary edema		
Acute tubular necrosis		
Cardiac hypertrophy		
septicemia		
Bronchopulmonary pneumonia		
Iron deficiency pneumonia		
Anemia		
malnutrition		
Generalised debility		
Heptalosplenomegaly		
Senility		
Anemia		
Starvation		
Fatty liver		
Chronic alcoholism		
spilepsy		
bronchopneumonia		
Fatty liver		
Necrotic kidney		
Chronic ischemic heart disease		

Table 7: Indicating cardio vascular system pathology

System	Diseases	Co-morbid condition	
Cardio Vascular System	Acute Myocardial Infarction	Left coronary artery occlusion Left ventricular wall aneurysm Dilated cardiomyopathy Hepatosplenomegaly Artherosclerosis Shock lung Hypertensive heart disease Coronary artery disease Obstructive pulmonomary disease Chronic glomerulonephritis Pneumonia Pleural effusion Malnutient deficiency Bronchopneumonia Pleural adhesion & edema Fatty degeneration of liver Chronic pancreatitis Broncho pulmonary pneumonia Chronic alcoholism Chronic alcoholism Fatty degeneration of liver Cirrhosis of liver Interventricular hemorrhage Narrowing of right coronary artery Fibroatheroma cardiomegaly Complete occlusion of right coronary artery Atheromatous plaques	
	Congestive cardiac failure		
	Chronic ischemic heart disease		
	Cardiac arrhythmia		
	Malignant hypertension		
	Cardiac insufficiency		
	Cardiac arrest		

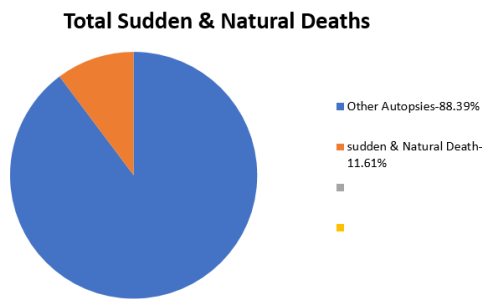


Fig. 1: Total sudden & natural death autopsies done in the present study.

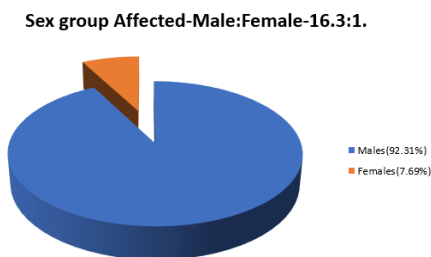


Fig. 2: Sex group affected.

3. Materials and Methods

The present study is a Retrospective Study, all Autopsy reports designated as Sudden and Unexpected Deaths for the period Jan 2017 to June 2022 were Collected and Studied. The Information on Cause of Death and the System Wise Pathology along with Histology reports, was obtained from the Autopsy reports besides, The Information on the circumstances and Past Medical History of the deceased were obtained from those available in the police inquest report and Hospital Records of the Respective Autopsy Records. The Information thus obtained were entered in a standard Performa and the same was analysed and studied. All Sudden Deaths wherein poisons or Unnatural causes were Excluded. onset of the terminal symptoms”.

4. Results

Sudden and unexpected deaths amounted to 11.61% of medico legal autopsies. Male to female rations was 16.3:1. Maximum incidence of sudden and unexpected deaths was reported above 35 yrs of age, with peak incidence between 41-50 years. Pulmonary pathology contributed 50% to major cause of sudden and unexpected deaths. The co morbid conditions associated with the leading cause of

Table 8: Comparison of similar studies done Else where.

Studies	% of sudden natural deaths	Male to female ratio	Max frequency age group	Common system involved
Present study	11.61%	16.3:1	40-49	Rs 50%
Sudden natural death in Khartoum Mortuary Elsadig Y. Mohamed, Ahmed Abdelbadie, Sawsun M. Abdalla, Adil A Alsideg, Ammar Hassan Khamis Sudden natural death in Khartoum Mortuary Elsadig Y. Mohamed, Ahmed Abdelbadie, Sawsun M. Abdalla, Adil A Alsideg, Ammar Hassan Khamis Sudden natural death in Khartoum Mortuary Elsadig Y. Mohamed, Ahmed Abdelbadie, Sawsun M. Abdalla, Adil A Alsideg, Ammar Hassan Khamis	-	4.9:1	40 and below	RS 49.3%
Sudden & Unexpected Natural Deaths-A four Year Autopsy Review. Dr. Dinesh S Rao Dr. Yadhukul5	8.67%	5.8:1	45-65	CVS 66.67%
A study of sudden natural deaths in medico legal autopsies in University Malaya Medical Centre (UMMC), Kuala Lumpur Virendra Kumar *, Kang Pei San, Anuar Idwan, Norazlan Shah, Siti Hajar, Mohamad Norkahf6	18.8%	6.8:1	41-50	CVS 64.9%
Study of Sudden Natural Deaths in Medico-Legal autopsies wit specific reference to Cardiac Causes. Sandesh H. Chaudhari, Anand Mugadlimath Mandar Sane, K.U. Zine D.I. Ingale, Rekha Hiremath7	9%	4.3:1.	41-50	CVS 44.6%
Causes of sudden natural death in Jamaica: a medicolegal (coroner's) autopsy study from the University Hospital of West Indies C.T. Escoffery, S.E. Shirley8	51.3%	1.2:1	61-70	CVS 65.5%
Autopsy findings in sudden death in adults: a study of 150 cases Rahul A. Modi, Mubin I. Patel, Mandakini M. Patel, Suresh Padsala, Jainisha Chaudhary9	21.73%	4:1	35-45	CVS 56%

sudden natural deaths are mentioned in table no. 6.

5. Discussion

In the Present Retrospective Study conducted for the period 2017- June 2022, Sudden and Unexpected Natural Deaths contributed to 11.61%(n-52)(Fig-01) of the total number of Autopsies. The Observations are close to those made by V. Kumar et al.³ and Other studied else

Where,⁴⁻⁶ who had observed 18.8% of his cases contributing to Sudden Deaths, However majority of his victims studied were Males(87.2%).This results are close to the present study wherein Majority victims were Males(Table no 03)(Fig-02) contributing to 92.31%(n-48) of cases. All this clearly indicates the Male Preponderance in incidences of Sudden and Natural Death.⁷⁻⁹

In the present Study Majority of the Victims belonged to 4th Decade(Table no 01), contributing to 40.38%(n-21),this observations are similar to those made by Anand Mugadilmath et al.,² who inferred 30.81% of his victims belonging to similar age group. This findings also are close to the observations made by Meina singh et al.¹⁰

The present study also highlights the fact that Cardiovascular System contributed(Table no 02) to the Major number of Sudden Deaths in 69.23%(n-36) of Cases, this observations are consistent with similar studies done

by other Researchers else where.¹¹⁻¹⁸ All this indicates the fact that Cardiac Pathology is the main contributor for the Sudden and Unexpected nature of Deaths.The major comorbidites [Table no 06]observed that contributed to the underlying cause is Smoking, Obesity, Hypertension, Diabetes Mellitus and possible Life Style factor.

The Table no 3,5, 6,7 indicates the different type of Co Morbid Conditions that contributed to the Deaths.

The other major system involved in Sudden Deaths was the Respiratory System(Table no 02) contributing to 23.07%(n-12) of the Deaths, this results are close to the observations made by Anand Mugadilmath et al.²

The Gastro Intestinal System contributed to 5.77%(n-3) of Sudden Deaths which is in contrast to the studies done by Kuller et al.¹⁹ who observed 27.7% of his Victims died due to Gastro intestinal related causes. This wide variations is possible due to the Regional, Cultural and Life Style Factors. The Table no 08 compares similar studies done else where.

This Study Highlights importance of More Research involving the Cardiovascular System to understand the Causes of Death and at the same time prevent such deaths. It also emphasises the facSt that more studies required to understand the Dominance of Male Victims.

6. Abbreviations

CVS-Cardio Vascular system, CNS-Central Nervous System, RS-Respiratory System. GIT-Gastro Intestinal System, RES-Reticulo Endothelial System; HBS-Hepatobiliary System.

7. Source of Funding

None.

8. Conflict of Interest

None.

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