

# Study of Sudden Natural Death: An Autopsy Based Cross Sectional Study in a Tertiary Care Medical College and Hospital of Assam

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## Abstract

Sudden natural death accounts for significant portion of mortality. Autopsy is the only solution for finding the definite cause of sudden deaths. The aim of this study is to find out the causes of sudden natural death and to evaluate associated factors. Study comprise 64 cases of Sudden Death autopsies performed in Silchar Medical College during the period 1st May 2022 to 30th November 2022. The organs were retained for histopathological examination. Information gathered from available documents in departmental records. Inferences made after analyzing data. Out of 514 autopsies during the study period, 64 cases were sudden natural death. Male dominated over female victims. The maximum death occurred in the age group 40-50 years followed by 30-40 years. The cause of deaths in 39% were attributed to cardiac causes and the remaining were due to non-cardiac causes. Sudden unexpected death requires significant health concern as most death occurs in the age ranging from 30 to 50 years. Cardiac causes contribute the maximum and male population are mostly affected. This kind of death of adulthood affects the financial stability of whole family as well as the Society.

**Keywords:** Autopsy, Sudden Death, Adulthood, Natural Death, Histopathological examination

## Introduction

Sudden natural deaths contribute a significant portion of deaths. Autopsy is the only solution for finding the definite cause of sudden death. The term "sudden" has no agreed universal definition. World Health Organization (WHO) defines sudden death as death which is not known to have been caused by any dangerous disease, trauma, poisoning or violent asphyxia and where death occurs all of sudden or within 24 hours of the onset of the

terminal symptoms<sup>6</sup>. 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.<sup>5</sup> **The aim** of this study is to find out the causes of sudden natural death and to evaluate the socio demographic and epidemiological factors associated with it.

## Objectives

- To know about the socio-demographic profile of the deceased of sudden death cases

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- To know about the most predominant system of involvement (Cardiovascular, Respiratory, Central Nervous, Genito Urinary) from the available reports.

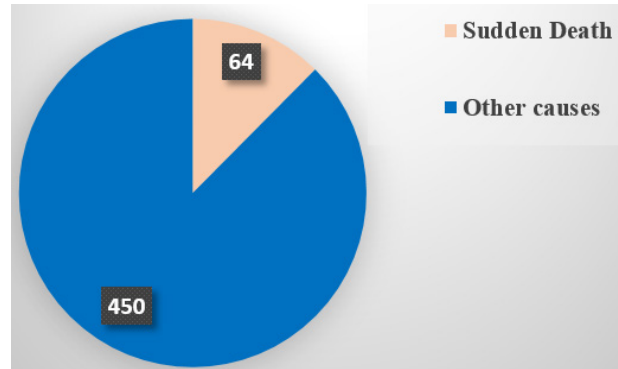
**Methods and Materials**

It is a Cross sectional study conducted among the Victims of sudden natural death cases brought to the Department of Forensic Medicine, Silchar Medical College for medico legal autopsy. A total of 64 Sudden Death cases from 1<sup>st</sup> May 2022 to 30<sup>th</sup> November 2022. The Inclusion Criteria consist of All cases of sudden natural death died within 24 hours of onset of terminal illness brought for autopsy and both sexes of all age groups were included. Unnatural deaths due to accidents, suicides and homicides; Putrefied or decomposed bodies, Poisoning cases and those cases of more than 24 hours of hospitalization were excluded from the study. The whole organ or the portion of organ showing gross pathological changes were retained for histopathological examination. Required information for the study was gathered from inquest reports, autopsy reports, histopathological examination reports and available documents in the departmental records. The collected information was statistically analysed using Microsoft excel version 2019.

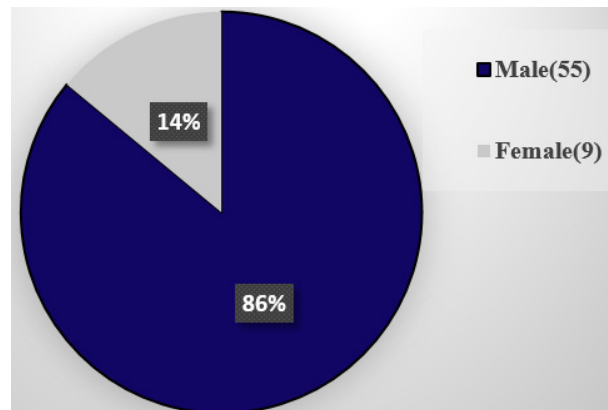
**Result**

During the study period, 514 medico-legal autopsies were conducted and out of these 64 (12.45%) cases were of sudden death. Males dominated over females in the ratio of 6.14:1(86% Male and 14% Females). Among the study population 62% were Hindus and 25% were Muslims and 11% were Christians. Reason could be due to the fact that Hindus constitute the main population in southern part of Assam. Even though age ranged from 0 to 80 years; maximum number of deaths were in the age group 40 to 50 years (31.25%) (20 cases) followed by 30 to 40 years (20.3%) (13 cases). Area wise distribution of cases consists of 66% belong to rural area. Among total 64 cases, 50% of victims died on the way to hospital, 41% found dead at home and only 9% died during hospital stay. Among the causes of sudden death, 25 cases (39%) were due to cardiovascular causes (CVS) followed by respiratory causes (30%), gastrointestinal causes (25%), central nervous system

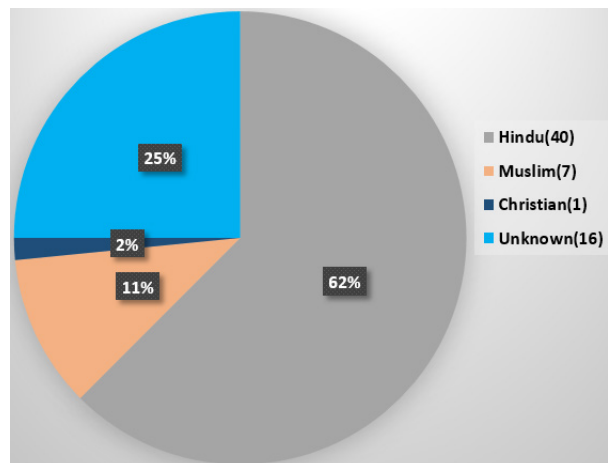
(CNS)(6%). Maximum cases of sudden death due to cardiac causes (39%) were seen in 40-50 years of age group and coronary artery disease (CAD) (64%) was the leading cause with male dominance. Respiratory 12 cases due to chronic parenchymal lung disease. Gastrointestinal 15 cases due to chronic liver disease. Central nervous system cause is 4 cases of intracerebral hemorrhage.



**Fig 1: Incidence**



**Fig 2: Sex wise incidence**



**Fig 3: Religion**

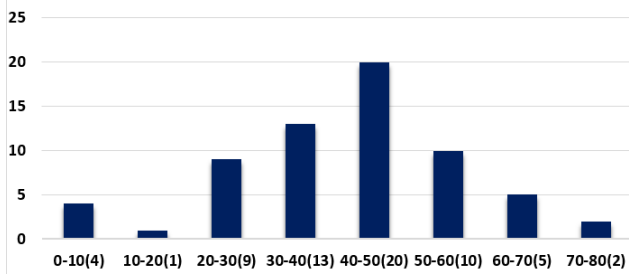


Fig 4: Age Distribution of victims

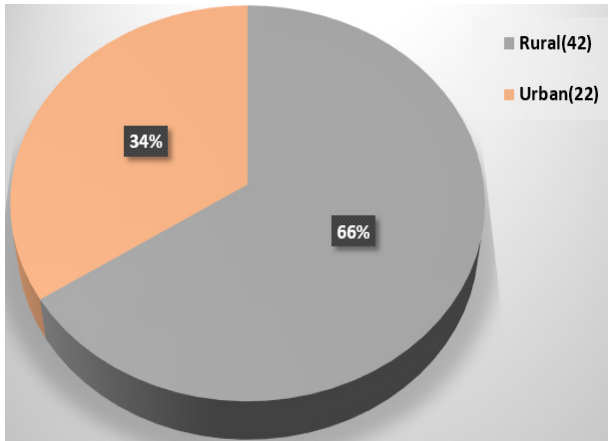


Fig 5: Area Distribution

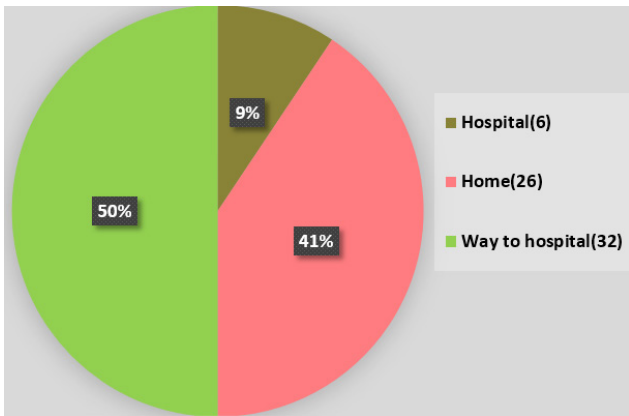


Fig 6: Place of occurrence

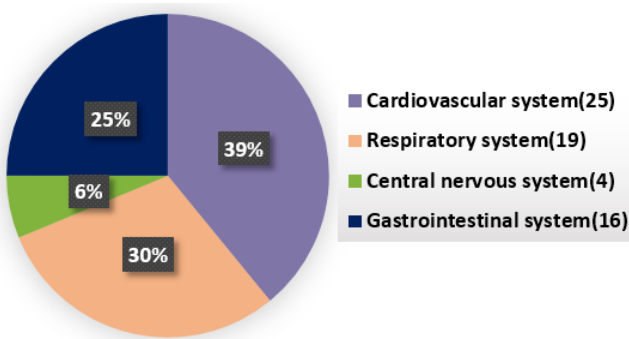


Fig 7: System Involved

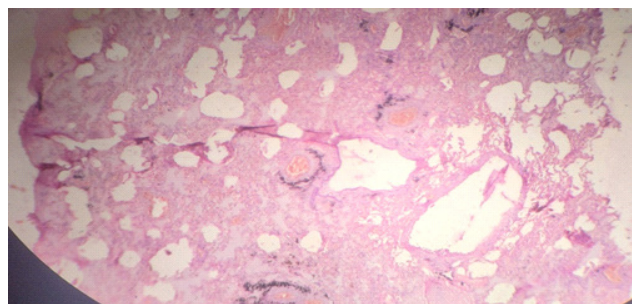
- Gross specimen of heart showing left ventricular hypertrophy. And the histopathology specimen showing thrombosis in capillaries.



- Specimen of chronic liver disease with histopathology showing normal hepatocytes are distended with large lipid vacuoles with peripherally displaced nuclei



- Histopathological section of lung tissue shows lung parenchyma with acute on chronic inflammatory cells infiltrate, stromal edema, congestion and foci of deposition of pigment material.



## Discussion

- In the present study, the incidence of sudden natural death was 12.45% (64/514) which is consistent with studies by Zanjad and Nanadkar (8.92%) and Chaudhari (9%)
- Male: Female ratio is 6.14:1(86% Male and 14% Female) and that is consistent with Chaudhari (4.3:1) and Zanjad and Nanadkar (5.6:1)
- Age distribution: Most of the cases (31.25%) belonged to 40 to 50 years of age group followed by 30 to 40 years of age (20.3%). Findings matches with study of Chaudhari and Zanjad and Nanadkar.
- From all above these studies, it is seen that the maximum number of sudden deaths are seen in the middle age (30-50 years). This may be due to westernization of Indian society, sedentary lifestyle with increased smoking and alcohol consumption habit.
- Although there are numerous causes of sudden death, cardiovascular causes are the principal cause among sudden death in the present study.
- Out of 64 cases of sudden death, 25 (39%) were due to cardiovascular causes, of which 21 (84%) were male and 4 (16%) were female. Similar findings seen with study of Modi (61%); Dayananda(41%); Zanjad and Nanadkar (49.55%)
- Coronary artery disease was not only the principle cause among cardiovascular causes (64%) and is the important cause among sudden death amounting to 25% with male predominance. Consistent with previous studies
- 29.7% were due to respiratory causes. Most common are Chronic parenchymal lung disease 12 cases (63.1%) and pneumonia 5 cases (26.3%). The findings of deaths due to respiratory diseases are similar to all above studies
- The incidence of deaths due to liver pathology, comparatively higher as compared to all above studies

- Cerebrovascular causes accounts for 6 % cases which is higher as compared to Modi (2%) and Chaudhari (3%). Consistent with Zanjad and Nanadkar (8%) and Dayananda (7%)
- 91% of all cases occurred outside the hospital setting
- Victims were either not aware of their prevailing medical conditions or refused to seek appropriate medical intervention.

## Conclusion

- In order to customize health care priorities and to plan for primary prevention strategies, predominant system involved has to be found out.
- Maximum cases of sudden natural death in the age group of 40 to 50 years of both sexes included in which males outnumbered females.
- This is a challenge to the health care professionals and increased awareness is needed among population at risk
- Coronary artery disease the cardiovascular disease is the most common cause and cause of death is confirmed by histopathological examination.
- Meticulous post-mortem examination always helps in avoiding unnecessary litigations in sudden death cases.
- Awareness of routine health check-up amongst the general public would help to reduce the incidence of such death.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from institutional ethics committee at Silchar Medical college, Silchar, Assam

## References

1. Chaudhari SH, Mugadlimath A et al. Study of sudden natural deaths in medico-legal autopsies with special reference to cardiac causes. *Int J Cur Res Rev*, 2013 Feb; 05 (03): 37-42.