

**SPECTRUM OF CARDIAC DEATHS IN MEDICO LEGAL  
AUTOPSIES AT A TERTIARY CARE CENTRE IN  
CHIKKAMAGALURU**

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**ABSTRACT**

*Background*

Cardiac diseases constitute one of the leading causes of natural deaths worldwide and frequently encountered in medico-legal autopsies. Sudden cardiac deaths often occur without prior clinical symptoms, making post-mortem examination crucial for determining the exact cause of death.

*Objectives*

To determine the proportion of cardiac deaths and cardiac causes of death among all medico-legal autopsies.

*Materials and Methods*

A retrospective descriptive study was conducted on medico-legal autopsies performed between 1st January 2023 and 31st December 2024 at a tertiary care centre in Chikkamagaluru. A total of 665 autopsy reports were reviewed. Relevant demographic details, gross and microscopic cardiac

findings and cause of death were analyzed. Data was compiled and expressed as frequencies and percentages using Microsoft Excel.

### Results

Out of 665 medico-legal autopsies, 87 deaths (13.08%) were attributed to cardiac causes. Myocardial infarction was the most common cause of cardiac death, accounting for 43 cases (49.4%), followed by cardiac failure in 20 cases (23.0%). Cardiac arrest accounted for 13 cases (14.9%), cardio-respiratory failure for 7 cases (8.0%) and coronary artery disease for 4 cases (4.6%).

### Conclusion

Cardiac deaths constitute a significant proportion of medico-legal autopsies in Chikkamagaluru, with myocardial infarction and coronary artery disease being the leading causes. Autopsy examination plays a vital role in accurately identifying the underlying cardiac pathology, particularly in sudden and unexpected deaths. The study highlights the need for early detection of cardiovascular risk factors and strengthened preventive strategies to reduce cardiac mortality.

**Key Words:** Cardiac death, Natural death, Myocardial Infarction, Cardiac Pathology.

### INTRODUCTION:

The heart is a vital organ responsible for maintaining continuous circulation of blood to all parts of the body, and any sudden or severe disturbance in its function can result in death. Cardiac death is defined as death resulting from diseases of the heart and great vessels, either due to structural abnormalities or functional disturbances, often occurring suddenly and unexpectedly.

Cardiovascular diseases are among the leading causes of mortality worldwide and account for a substantial proportion of natural deaths. Sudden cardiac death is a well-recognized entity in medico-legal practice and frequently poses diagnostic challenges, particularly when death occurs without prior symptoms or medical history. Many cardiac deaths occur outside hospital settings and are brought for medico-legal autopsy to ascertain the cause and manner of death.

In India, the burden of cardiovascular disease has increased significantly over the past few decades due to rapid urbanization, changing lifestyles, dietary habits, increasing prevalence of

hypertension, diabetes mellitus, smoking and sedentary behavior. However, cardiac deaths are not confined to urban populations alone. Rural and semi-urban regions are also witnessing a rising trend of cardiac mortality, often compounded by lack of early diagnosis and limited access to healthcare facilities.

Cardiac deaths may result from a variety of underlying pathologies, including myocardial infarction, coronary artery disease, cardio-myopathies, hypertensive heart disease and other structural abnormalities of the heart. In many cases, the terminal event is described as cardiac arrest or cardio-respiratory failure, which represents the final pathway of death rather than the underlying cause. Hence, medico-legal autopsy plays a crucial role in identifying the exact pathological cause of cardiac death.

Autopsy examination of the heart, including gross and histo-pathological evaluation, provides invaluable information regarding the presence of coronary artery disease, myocardial infarction and other cardiac pathologies that may not have been clinically diagnosed during life. Autopsy-based studies thus serve as an important source of epidemiological data on cardiac mortality, particularly in regions where clinical records may be incomplete or unavailable.

Chikkamagaluru district, though predominantly agricultural, is undergoing gradual lifestyle transitions that may influence cardiovascular health. However, there is limited published literature documenting the pattern and causes of cardiac deaths in this region. The present study was therefore undertaken to analyze the proportion of cardiac deaths among medico-legal autopsies and to study the spectrum of cardiac causes of death at a tertiary care centre in Chikkamagaluru over a period of two years.

## **MATERIALS AND METHODOLOGY:**

*Study Design:* Retrospective descriptive study.

*Study Period:* The study was conducted over a period of two years from 1st January 2023 to 31st December 2024.

*Study Setting:* Department of Forensic Medicine, tertiary care centre, Chikkamagaluru.

*Study Material:* A total of 665 medico-legal autopsies conducted during the study period constituted the study material.

### Inclusion Criteria

All medico-legal autopsies in which the cause of death was attributed to cardiac causes based on post-mortem findings.

### Exclusion Criteria

1. Deaths due to poisoning, trauma, burns, hanging, drowning, asphyxia, septicemia and other non-cardiac causes.
2. Deaths due to cardiac shock secondary to blunt chest trauma.

### Methodology

The study was conducted after obtaining approval from the Institutional Ethics Committee. Secondary data was collected from post-mortem records, police inquest reports and histopathological examination reports.

A complete medico-legal autopsy was performed in each case following standard dissection techniques. Detailed examination of the heart and great vessels was carried out, including assessment of heart weight, chamber dimensions, myocardial thickness and coronary artery patency. Histopathological examination of myocardial tissue was performed wherever indicated to confirm the diagnosis.

Cases were classified based on the underlying cardiac pathology into myocardial infarction, coronary artery disease, cardiac failure and other cardiac causes. Cases described as cardiac arrest or cardio-respiratory failure were categorised based on the underlying cardiac pathology identified at autopsy.

### Data Analysis

The collected data was analysed using Microsoft Excel. Results were expressed in terms of frequencies and percentages and presented in the form of tables and graphs.

## **RESULTS:**

During the study period from January 2023 to December 2024, a total of 665 medico-legal autopsies were conducted at the tertiary care centre in Chikkamagalur. Of these, 87 cases were

attributed to cardiac causes of death and formed the study group. Cardiac deaths thus constituted 13.08% of all medico-legal autopsies conducted during the study period.

Cardiac causes emerged as one of the significant contributors to mortality among medico-legal autopsies. Out of the total 665 cases, 87 deaths were due to cardiac pathology, highlighting the importance of cardiovascular diseases as a major cause of sudden and unexpected deaths encountered in medico-legal practice.

Myocardial infarction (MI) was the most common cardiac cause of death, accounting for 43 cases (49.43%). These cases included both acute and old myocardial infarctions identified during post-mortem examination based on characteristic gross and microscopic findings.

Cardiac failure constituted the second most common cause, observed in 20 cases (22.99%). These cases showed evidence of structural or functional cardiac abnormalities consistent with heart failure, including dilated cardiac chambers, ventricular hypertrophy and myocardial degeneration.

Coronary artery disease (CAD) without definite evidence of myocardial infarction was identified in 4 cases (4.59%), based on significant coronary atherosclerosis and luminal narrowing observed during autopsy.

The remaining 20 cases (22.99%) were categorised under other cardiac causes, which included cases initially labeled as cardiac arrest or cardio-respiratory failure, where underlying cardiac pathology was evident on post-mortem examination. In these cases, cardiac arrest represented the terminal event secondary to pre-existing cardiac disease.

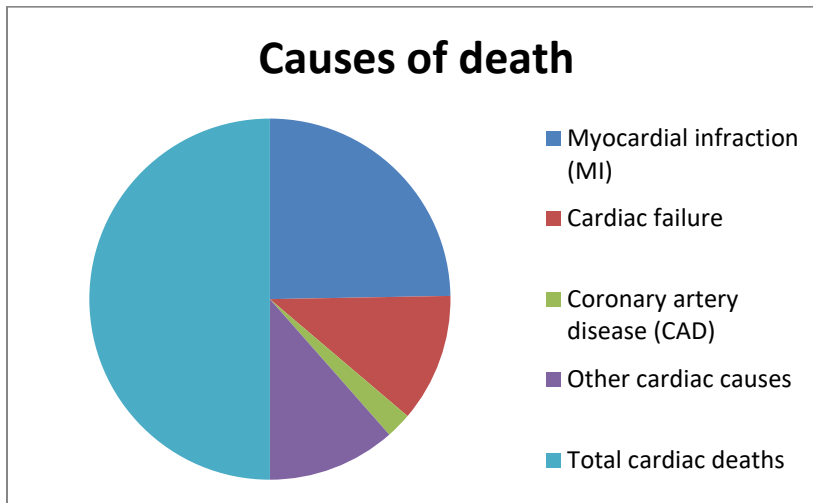
Ischaemic heart disease, comprising myocardial infarction and coronary artery disease, together accounted for the majority of cardiac deaths in the present study. Conditions related to cardiac pump failure and terminal cardiac events also contributed substantially to overall cardiac mortality.

The distribution of cardiac causes of death is presented in Table 1. The relative contribution of various cardiac causes is depicted in Figure 1 (pie chart) and 2 (Bar Graph), illustrating myocardial infarction as the predominant cause of cardiac death among the study population.

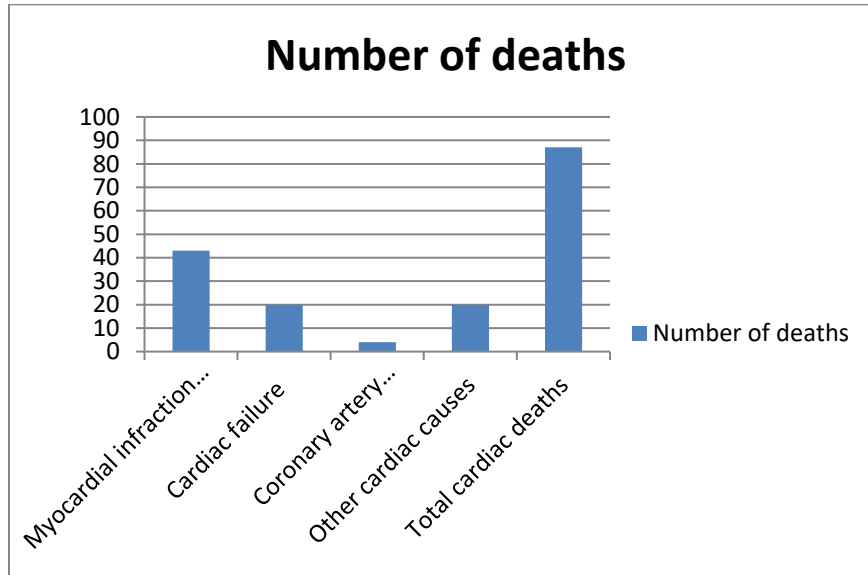
**TABLE 1: Distribution of cardiac cases of death.**

Cardiac causes of death	Number of deaths
Myocardial infarction (MI)	43
Cardiac failure	20
Coronary artery disease (CAD)	4
Other cardiac deaths	20
<b>Total deaths</b>	<b>87</b>

**Fig. 1. Contribution of various cases of cardiac death.**



**Fig. 2.** Contribution of various cases of cardiac death.



## DISCUSSION:

Cardiac diseases constitute a major cause of natural deaths worldwide and are frequently encountered in medico-legal autopsies. Sudden and unexpected cardiac deaths often occur without preceding symptoms, making autopsy examination essential for establishing the cause of death. In developing countries like India, the burden of cardiovascular disease continues to rise due to demographic transition, lifestyle changes and increasing prevalence of risk factors.

Autopsy-based studies provide valuable insight into the true magnitude and pattern of cardiac deaths, especially in cases where individuals die outside healthcare settings. Such studies help bridge the gap between clinical diagnosis and actual pathological findings, thereby contributing to a better understanding of cardiac mortality.

Myocardial infarction and coronary artery disease have consistently been reported as the leading causes of cardiac death in autopsy studies across India. Coronary atherosclerosis leading to compromised myocardial blood supply remains the primary pathological mechanism underlying sudden cardiac death. Many individuals with significant coronary artery disease may remain asymptomatic until a fatal cardiac event occurs.

Cardiac failure represents another important cause of cardiac death and is often associated with chronic cardiac conditions such as cardiomyopathy, hypertensive heart disease and ischemic heart disease. Structural and functional changes in the myocardium ultimately impair the heart's ability to maintain adequate circulation, resulting in fatal outcomes.

In medico-legal practice, causes of death are sometimes documented as cardiac arrest or cardio-respiratory failure. These terms describe the terminal physiological event rather than the underlying disease process. Detailed autopsy examination is therefore crucial to identify the primary cardiac pathology responsible for death and to avoid misclassification.

The predominance of ischemic heart disease and related conditions in the present study reflects the growing burden of cardiovascular disease even in semi-urban and rural regions. Limited access to healthcare facilities, lack of early diagnosis and inadequate awareness regarding cardiac symptoms may contribute to sudden cardiac deaths in these populations.

The findings of the present study emphasise the importance of preventive strategies, including early detection of cardiovascular risk factors, lifestyle modification and improved access to medical care. Autopsy-based data such as this can aid clinicians, forensic experts and public health authorities in understanding regional trends and formulating appropriate preventive measures.

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