

**Autopsy Based Comparative Study of Different Types of Asphyxial Deaths Conducted at P.M.C.H., Patna**

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**Abstract**

**Background:** Asphyxial deaths constitute a major proportion of medico-legal autopsies and present significant challenges in forensic investigation. Various forms of asphyxia demonstrate distinct demographic profiles, manners of death, and autopsy findings. Understanding these patterns is essential for accurate medico-legal interpretation and formulation of preventive strategies.

**Objectives:** To compare different types of Asphyxial deaths with respect to demographic characteristics, manner of death, seasonal variation, place of occurrence, and autopsy findings among medico-legal autopsies conducted at PMCH, Patna.

**Materials and Methods:** A retrospective observational study was conducted on 110 medico-legal autopsy cases

of Asphyxial deaths performed at the Department of Forensic Medicine and Toxicology, PMCH, Patna. Data regarding age, sex, type of asphyxia, manner of death, place of occurrence, seasonal variation, and autopsy findings were analysed using descriptive and inferential statistical methods.

**Results:** The majority of victims belonged to the 21–30 years age group (38.16%), with a mean age of  $26.57 \pm 12.77$  years. Males constituted 73.68% of cases. Hanging was the most common type of Asphyxial death (43.42%), followed by drowning (36.84%) and strangulation (6.58%). Suicidal deaths accounted for 44.74%, accidental deaths for 38.16%, and homicidal deaths for 17.11% of cases. Cyanosis (98.68%) and visceral congestion (94.74%) were the most frequent autopsy findings. Dowry-related deaths comprised

10.53% of cases and were significantly associated with homicidal asphyxia.

**Conclusion:** Asphyxial deaths predominantly affect young adult males, with hanging and drowning accounting for the majority of cases. Distinct associations exist between the type of asphyxia and the manner of death. Comprehensive medico-legal investigation integrating autopsy findings with circumstantial evidence remains crucial for accurate determination of cause and manner of death.

**Keywords:** Asphyxia; Hanging, Drowning, Strangulation, Smothering, Autopsy, Forensic Medicine, Medico-Legal Death, Bihar.

### Introduction

Asphyxia refers to a state of impaired oxygen delivery or utilization resulting from interference with respiration, leading to hypoxia, hypercapnia, and ultimately death if untreated. It represents one of the most significant categories of medico-legal deaths encountered during forensic autopsies. The mechanisms involved include hanging, strangulation, drowning, smothering, choking, gagging, traumatic asphyxia, and positional asphyxia.

The epidemiological pattern of Asphyxial deaths varies according to geographical region, socio-economic status, environmental conditions, and cultural practices. Hanging is recognized as one of the most common methods of suicide worldwide, whereas drowning remains a major cause of accidental mortality, particularly in developing countries with extensive exposure to natural water bodies. Homicidal forms of asphyxia such as strangulation and throttling continue to pose considerable medico-legal challenges.

The present study was undertaken to compare different forms of Asphyxial deaths encountered during medico-legal autopsies at PMCH, Patna, and to evaluate their

demographic profile, manner of death, and associated autopsy findings.

### Materials and Methods

#### Study Design

Retrospective observational autopsy-based study.

#### Study Setting

Department of Forensic Medicine and Toxicology, Patna Medical College and Hospital (PMCH), Patna, Bihar, India.

#### Study Population

All medico-legal autopsy cases diagnosed as Asphyxial deaths during the study period.

#### Sample Size

110 Autopsy cases of “The present retrospective autopsy-based study was conducted in the Department of Forensic Medicine and Toxicology, Patna Medical College and Hospital (PMCH), Patna, Bihar, India, over a period of one year from 01 June 2025 to 31 May 2026.”

#### Inclusion Criteria

Confirmed cases of Asphyxial deaths.

Complete autopsy records available.

Cases with adequate police and medico-legal documentation.

#### Exclusion Criteria

Advanced decomposition obscuring findings.

Incomplete autopsy records.

Cases with uncertain cause of death.

#### Variables Studied

Age

Sex

Type of asphyxia

Manner of death

Place of occurrence

Seasonal variation

Autopsy findings

**Statistical Analysis:** Data were entered in Microsoft Excel and analysed using descriptive statistical methods. Associations between variables were assessed using appropriate statistical tests. A p-value <0.05 was considered statistically significant.

**Results**

**Age Distribution**

The highest incidence was observed in the 21–30 years age group (38.16%), followed by 10–20 years (19.74%). Mean age was 26.57 ± 12.77 years.

**Sex Distribution**

Out of 110 cases, 81 (73.68%) were males and 29 (26.32%) were females, giving a male-to-female ratio of approximately 2.8:1.

**Distribution of Types of Asphyxia**

Type	Percentage
Hanging	43.42%
Drowning	36.84%
Strangulation	6.58%
Throttling	3.95%
Traumatic Asphyxia	3.95%
Smothering	2.63%
Choking	1.32%
Suffocation	1.32%

Manner of Death	Percentage
Suicidal	44.74%
Accidental	38.16%
Homicidal	17.11%

**Seasonal Distribution**

The highest incidence occurred during monsoon (22.37%) and summer (22.37%), followed by autumn (19.74%), winter (18.42%), and spring (17.11%).

**Place of Occurrence**

Most incidents occurred at home (53.95%), followed by rivers (23.68%) and ponds (13.16%).

**Autopsy Findings**

Finding	Percentage
Cyanosis	98.68%
Visceral Congestion	94.74%
Petechial Hemorrhage	63.16%

**Discussion**

The present study demonstrated that young adults constitute the most vulnerable age group for Asphyxial deaths. Similar findings have been reported by several Indian studies where socio-economic stress, occupational exposure, and psychological factors contribute significantly to mortality in this age group.

Male predominance observed in the present study is consistent with previous forensic literature. Greater occupational exposure, risk-taking behaviour, and social responsibilities may account for the increased incidence among males.

Hanging emerged as the leading form of Asphyxial death and was predominantly suicidal in nature. Drowning represented the second most common category and was largely accidental, reflecting the widespread exposure of the population to natural water bodies in Bihar.

Strangulation, throttling, and smothering were predominantly homicidal, emphasizing the importance of meticulous autopsy examination and correlation with investigative findings. The strong association between dowry-related deaths and homicidal asphyxia observed in this study underscores the continued medico-social significance of domestic violence in the region.

Cyanosis and visceral congestion were found to be the most reliable indicators of Asphyxial deaths, whereas petechial haemorrhages showed variable occurrence. These findings support the concept that diagnosis of asphyxia should be based on a combination of gross findings, microscopic examination, and circumstantial evidence.

### Conclusion

The present autopsy-based comparative study highlights the epidemiological and medico-legal characteristics of Asphyxial deaths in Bihar. Young adult males constitute the most affected population. Hanging and drowning account for the majority of cases, while homicidal forms are primarily represented by strangulation and throttling. Autopsy findings such as cyanosis and visceral congestion remain valuable indicators; however, determination of cause and manner of death requires careful correlation with scene investigation, police records, and circumstantial evidence. Strengthening mental health awareness, water safety measures, and interventions against domestic violence may contribute significantly to reducing the burden of Asphyxial deaths.

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