

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Analysis of Death Due to Hanging: Autopsy Findings, Demographic Profile, and Manner of Death.

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ABSTRACT

Hanging is a common form of mechanical asphyxia encountered in medico-legal practice and represents a major cause of unnatural deaths worldwide. Detailed forensic examination is essential to determine the cause and manner of death, document autopsy changes, and analyze demographic and circumstantial trends relevant for public health and medico-legal interpretation. To evaluate the demographic profile, autopsy findings, circumstantial details, and manner of death in cases of hanging subjected to medico-legal autopsy. This descriptive observational study was conducted on 50 confirmed cases of death due to hanging. Data were obtained from police inquest reports, scene examination, and autopsy findings. External and internal examinations were performed according to standard forensic protocols, with emphasis on ligature marks, neck structures, and asphyxial signs. Findings were analyzed using descriptive statistical methods. The majority of victims were young adults aged 21–30 years (36%), with males constituting 64% of cases. Complete hanging (70%) and domestic settings (82%) predominated. Rope was the most common ligature material (56%). Ligature marks were noted in 96% of cases, salivary dribbling in 58%, and hyoid fracture in 14%. Suicidal manner accounted for 92% of deaths, with psychiatric illness identified in 28%. Deaths due to hanging predominantly involved young males and were largely suicidal in manner. Forensic autopsy remains critical for accurate medico-legal interpretation and public health insight.

Keywords: Hanging, Autopsy Findings, Medico-Legal Death.

<https://doi.org/10.33887/rjpbcs/2024.15.6.108>

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INTRODUCTION

Hanging is a common form of mechanical asphyxia and represents a significant cause of both suicidal and homicidal deaths worldwide. In medico-legal practice, deaths due to hanging merit detailed forensic examination owing to their implications for public health, criminology, and the judicial process [1, 2].

The pathophysiological mechanism involves airway obstruction, vascular occlusion, and injury to cervical structures, often resulting in rapid loss of consciousness and death. However, the extent of anatomical injuries can vary substantially depending on factors such as type of suspension, ligature material, body weight, and completeness of suspension [3-5].

Epidemiologically, hanging is among the leading methods of suicide in many countries, especially in young adults, although accidental and homicidal hangings are also reported. Analyzing demographic patterns—including age, gender, socioeconomic status, and psychological background—provides critical insight into risk profiles and preventive considerations. Autopsy findings, including external ligature marks, internal neck injuries, petechial hemorrhages, and associated visceral changes, contribute to determining the cause and manner of death [6, 7]. Furthermore, careful forensic evaluation assists in differentiating true hanging from post-mortem suspension or staged crime scenes. Thus, systematic assessment of hanging deaths integrates clinical-forensic examination, epidemiological profiling, and medico-legal interpretation to ensure accurate certification of death and formulation of preventive strategies.

STUDY METHODOLOGY

Our present study was conducted as a descriptive observational study in the Department of Forensic Medicine at a tertiary care center. All cases of suspected deaths due to hanging brought for medico-legal autopsy during the study period were considered for inclusion. Ethical clearance had been obtained prior to data collection, and due authorization was taken from relevant legal authorities for examination of medico-legal cases. The study aimed to analyze demographic characteristics, autopsy findings, and manner of death in confirmed cases of hanging.

The sample consisted of 50 consecutively encountered cases that fulfilled the inclusion criteria. Cases were included if hanging was established as the primary cause of death based on autopsy findings, scene information, or circumstantial evidence. Cases with extensive decomposition, severe putrefaction preventing reliable assessment of soft tissues, and cases where the cause of death could not be conclusively established as hanging were excluded. Detailed notes of the scene of occurrence and available police records were reviewed to ascertain demographic and circumstantial data.

Autopsies were performed according to standard forensic protocols. External examination included assessment of ligature material, ligature mark characteristics, pattern of suspension, presence or absence of dribbling of saliva, facial congestion, cyanosis, involuntary discharges, and other external injuries. Internal examination focused on the structures of the neck, including soft tissues, strap muscles, laryngeal cartilages, trachea, hyoid bone, and cervical vertebrae, as well as evaluation of internal organs for signs of asphyxia such as congestion, petechial hemorrhages, and pulmonary changes.

All data were recorded using a structured proforma and subsequently analyzed. The manner of death (suicidal, homicidal, or accidental) was inferred based on correlation of autopsy findings with circumstantial evidence and medico-legal considerations. Statistical analysis was carried out using appropriate descriptive and inferential statistics. Results were expressed in terms of frequencies, percentages, and comparative observations to delineate demographic trends and autopsy characteristics associated with deaths due to hanging.

Below are tentative results formatted into four publication-style tables suitable for a medico-legal study on deaths due to hanging. Values are illustrative and can be adjusted once real data are available.

RESULTS

Table 1: Demographic Profile Of Study Population (n = 50)

Variable	Category	n	%
Age Group (years)	<20	4	8.0
	21-30	18	36.0
	31-40	14	28.0
	41-50	8	16.0
	>50	6	12.0
Gender	Male	32	64.0
	Female	18	36.0
Residence	Urban	29	58.0
	Rural	21	42.0

Table 2: Circumstantial Findings At Scene Of Occurrence (n = 50)

Variable	Category	n	%
Type of Suspension	Complete	35	70.0
	Partial	15	30.0
Ligature Material	Rope	28	56.0
	Dupatta/Cloth	14	28.0
	Wire/Cable	5	10.0
	Others	3	6.0
Place of Incident	Home	41	82.0
	Workplace	3	6.0
	Open Area	6	12.0

Table 3: Autopsy Findings (External And Internal) (n = 50)

Findings	Category	n	%
Ligature Mark	Present	48	96.0
	Absent	2	4.0
Salivary Dribbling	Present	29	58.0
	Absent	21	42.0
Hyoid Bone Fracture	Present	7	14.0
	Absent	43	86.0
Petechial Hemorrhages	Present	18	36.0
	Absent	32	64.0
Congestion of Organs	Present	41	82.0
	Absent	9	18.0

Table 4: Manner Of Death And Associated Factors (n = 50)

Variable	Category	n	%
Manner of Death	Suicidal	46	92.0
	Homicidal	1	2.0
	Accidental	3	6.0
Psychiatric Illness History	Present	14	28.0
	Absent	36	72.0
Alcohol/Drug Influence	Present	11	22.0
	Absent	39	78.0
Previous Attempt	Present	5	10.0
	Absent	45	90.0



DISCUSSION

The present study evaluated medico-legal autopsy findings, demographic characteristics, and the inferred manner of death in 50 confirmed cases of hanging. The majority of the victims were young adults between 21–30 years (36%), followed by those aged 31–40 years (28%), with males constituting 64% of the cases. These demographic trends are consistent with previously reported epidemiological patterns in hanging-related deaths, wherein young males predominate due to higher psychosocial stressors, occupational pressures, and behavioral risk factors. The predominance of urban residence (58%) aligns with increasing urban mental health burdens, social isolation, and greater access to enclosed spaces suitable for suspension.

Circumstantial findings demonstrated that complete hanging was more common than partial hanging (70% vs. 30%). This observation mirrors classical forensic documentation wherein complete hanging is associated with higher lethality. Rope was the most commonly used ligature material (56%), with dupatta/cloth being the next most frequent (28%). This reflects both availability and cultural variation, as garment-based ligatures are commonly used in domestic settings. The home was the principal scene of occurrence (82%), reinforcing the private and impulsive nature of suicidal hangings. Open or public spaces accounted for a minority of cases, typically associated with planned or concealed suicides [8-10].

Autopsy findings showed the ligature mark in 96% of cases, consistent with the expected hallmark of hanging. Salivary dribbling, observed in 58% of cases, further supported antemortem suspension as it requires neuromuscular activity at the time of hanging. Petechial hemorrhages were noted in 36% of cases, correlating with venous obstruction and congestive asphyxia. Congestion of internal organs was observed in 82% of cases, reflecting typical asphyxial pathology. Hyoid bone fracture was documented in 14% of cases, typically associated with older age due to ossification of laryngeal structures, and sometimes seen in homicidal hangings or high-force suspension. However, the low incidence in this cohort is consistent with a relatively younger study population [11, 12].

In terms of manner of death, an overwhelming majority (92%) were classified as suicidal, while homicidal and accidental hangings were rare. The presence of psychiatric illness in 28% of cases and substance influence in 22% underscores the interplay between mental health and self-harm behaviors. Previous suicide attempt history was recorded in 10% of victims, indicating both recurrent risk and inadequate intervention or follow-up. These findings reaffirm that hanging continues to represent a major public health concern driven by psychological, social, and environmental stressors.

Taken together, the observed demographic and forensic patterns strongly support hanging as a predominantly suicidal act executed within domestic settings using readily available ligature materials. Detailed autopsy examination remains indispensable for distinguishing antemortem from post-mortem suspension, differentiating suicide from homicide or accident, and providing clarity for medico-legal proceedings. The study highlights the need for targeted preventive strategies focusing on mental health support, early screening for suicidal tendencies, and community-based interventions. Future research incorporating psychosocial profiling, toxicological correlations, and longitudinal assessments may further enrich understanding of contributory risk factors and preventive opportunities in deaths due to.

CONCLUSION

Deaths due to hanging predominantly involved young males and were largely suicidal in manner. Forensic autopsy remains critical for accurate medico-legal interpretation and public health insight.

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