

Trends of Suicidal Hangings Brought to the Mortuary of Assam Medical College and Hospital Dibrugarh: A Two-Year Retrospective Study**Swaraj Phukon¹, Gurjeet Singh Juneja², Nandini Pegu³, Jeneth Karmakar⁴, Nabajit Barman⁵**¹Assistant Professor, Forensic Medicine, Assam Medical College²PGT, Forensic Medicine, Assam Medical College³Associate Professor, Forensic Medicine Assam Medical college⁴Assistant Professor, TRIHMS, Arunachal Pradesh⁵Associate Professor, Forensic Medicine Department, Assam Medical College

Received: 01-07-2024 Revised: 15-08-2024 / Accepted: 21-09-2024

Corresponding author: Dr. Jeneth Karmakar

Conflict of interest: Nil

Abstract

Suicide remains a major cause of mortality worldwide, reflecting a region's living conditions as well as its social and psychological dynamics. This study aims to analyse the prevalence, trends, and factors associated with hanging deaths referred for medico-legal autopsies in Dibrugarh, Assam. We assessed the incidence of hanging deaths, identified contributing factors, and examined relevant autopsy findings. A retrospective analysis was conducted on hanging cases autopsied at the Department of Forensic Medicine, Assam Medical College and Hospital, Dibrugarh, from January 1, 2022, to December 31, 2023. Data was collected following appropriate permissions from the college authority, and statistical methods were employed for analysis. Among the 3,716 autopsies performed, 524 cases (14.1%) involved hanging. Males accounted for 304 cases (58.01%), while females comprised 220 cases (41.9%), with the most affected age group being 20 to 30 years (176 cases, 33.58%). Family disputes were identified as the leading cause in 164 cases (31.29%), followed by romantic relationship issues in 104 cases (19.84%). Tea garden workers constituted 156 cases (29.77%), and students represented 122 cases (23.28%). Nylon rope was the most common ligature material, used in 104 cases (19.84%). The study highlights suicide as a critical public health issue, underscoring the need for the medical community's involvement in prevention efforts. Initiatives promoting education, compassion, and reducing societal pressures may decrease suicide rates among young individuals, ultimately enhancing their productivity and benefiting developing economies like India.

Keywords: Suicide, Hanging, Autopsy, Ligature Material.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

The term "suicide" is the phrase for the intentional, self-planned taking of one's own life. It is derived from the words "sui," which means of oneself, and "cide," which means killing of. The World Health Organization (WHO) estimates that 800,000 people attempt suicide each worldwide, with India having the highest suicide rate in Southeast Asia. [1] A prevalent method of suicide is hanging, which involves placing a neck tie on the victim to induce unconsciousness and ultimately death by suspension or partial suspension [2]. In India, hanging is among the top five methods of choice for committing suicide, the other techniques that are most often used include poisoning, drowning, burning and jumping from a tall building or in front of a running train. [3]

The primary goal of the study was to determine the prevalence, pattern and cause of hanging brought for

medico-legal autopsy in Dibrugarh, Assam. [4] Most hangings are self-suspension. This may be carried out by a wide variety of methods, but a typical method of self-suspension is to attach a thin rope to a high point such as a ceiling beam or staircase. The lower end is formed into either a fixed loop or a slipknot, which is placed around the neck while the intending suicide stands on a chair or other support. [5] Hanging is invariably suicidal. Accidental and homicidal hangings are rare [6].

Material and Methods

This study was conducted in the Department of Forensic Medicine at Assam Medical College and Hospital (AMCH) in Dibrugarh, Assam, India, over two years from January 1, 2022, to December 31, 2023. During this time, a total of 3,716 autopsies

were performed. This study focused exclusively on cases of alleged suicidal hanging, excluding all other causes of death.

Collection of data

The primary data in each case is gathered from the police inquest, along with statements from relatives taken by the investigating officers and the autopsy surgeon. Findings from a comprehensive external and internal examination of the body were analyzed in detail. Postmortem reports were reviewed for all cases. The cases were examined using various criteria, including methods of suicide with gender distribution, age groups of the victims, religious affiliation, common ligature materials, and reasons for hanging.

Data Analysis

The data were imported from Microsoft Excel into SPSS. The same software was then used to create figures and calculate descriptive statistics, including means, ranges, odds ratios, confidence intervals, and p-values. A chi-square test was conducted to assess the statistical significance of differences between the categorical variables.

Results

During the study period from 2022 to 2023, a total of 3,716 medico-legal autopsies were conducted, of which 524 were cases of hanging. The highest incidence occurred in 2023 with 310 cases, while the lowest was in 2022 with 214 cases. There is a noticeable increase in the trend of suicidal hanging in 2023. Among the 524 cases, 304 (58.01%) were

males and 220 (41.9%) were females, resulting in a male-to-female ratio of 1.4:1. Of these cases, 364 (69.46%) involved complete hanging, while 160 (30.54%) involved partial hanging.

The cases were categorized into six age groups: 11–20 years (88 cases, 16.79%); 21–30 years (176 cases, 33.58%); and so on. The youngest individual was 15 years old, and the oldest was 88 years old.

The most common reason for suicide was family disputes, accounting for 164 cases (31.29%), followed by love affairs (104 cases, 19.84%), financial crises (41 cases, 15.64%), exam failures (60 cases, 11.45%), alcoholism (34 cases, 6.48%), mental disorders (13 cases, 4.96%), unknown reasons (38 cases, 7.25%), and menstruation-related issues (16 cases, 3.05%).

Tea garden workers made up 156 cases (29.77%), followed by students at 122 cases (23.28%). The majority of the deceased were Hindu, comprising 214 cases (40.83%), followed by Muslims at 176 cases (33.58%) and Christians at 64 cases (12.21%). More than 336 cases (64.12%) came from rural areas, while 188 cases (35.87%) were from urban areas.

In this study, ligature materials were found in situ in only 300 cases (57.3%). The most commonly used ligature material was nylon rope, present in 104 cases (19.84%), followed by jute rope in 64 cases (12.21%). This indicates that many individuals used readily available and inexpensive materials, such as rope, cotton rope, and synthetic sarees, to commit suicide.

Table 1: Distribution of cases according to ligature material used.

Ligature Material	Number of cases	Percentage (%)
Cotton Dhoti	8	1.5%
Cotton Dupatta	30	5.7%
Cotton rope	32	6.1%
Cotton Gamucha	8	1.5%
Synthetic saree	50	9.54%
Nylon rope	104	19.84%
Jute rope	64	12.21%
ELECTRIC WIRE	4	0.76%
NA	224	42.7%
Total	262	100%

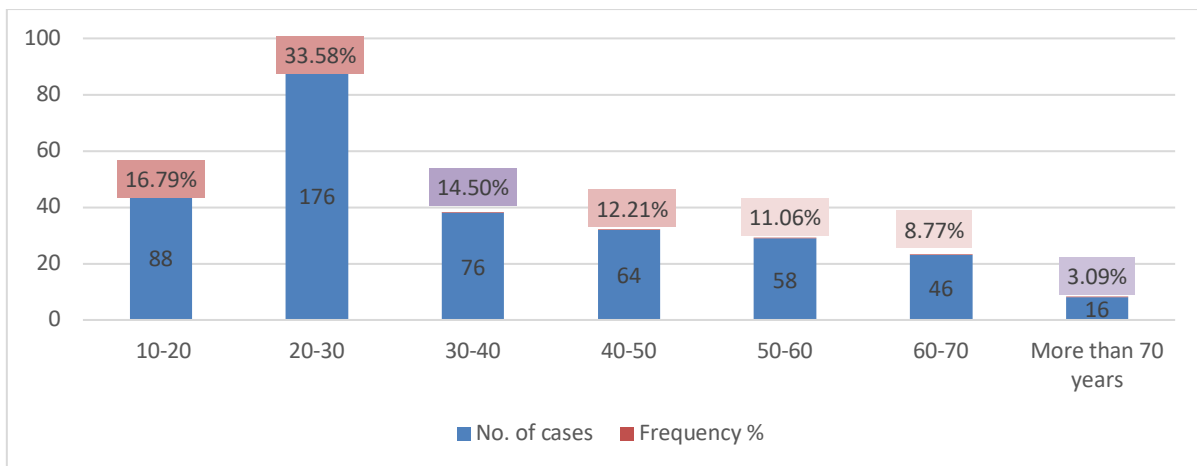


Figure 1: The bar graph displays the number of suicides by age group, highlighting those individuals aged 20 to 30 experienced the highest incidence of fatalities.

Discussion

Every suicide is a tragic event that leads to the premature loss of life and profoundly affects the families and communities of the victims. This study aimed to investigate instances of suicide by hanging, focusing on the reasons or circumstances that led individuals to take their own lives. The findings were analyzed and compared with those from related studies.

This retrospective prospective study was conducted between 2022 and 2023. A total of 3716 cases were autopsied during this period, of which deaths due to hanging comprised 14.10% (n = 524) of autopsies. Similar studies conducted by Dinesh Rao A Total of 634 cases were studied during the period of 11 years. [2] the period of study was from 2009 to 2020 [2]. In another study conducted by Debnath JDhaka Medical College Hospital, A total number of 167 autopsies were done during this period on dead bodies that died due to hanging, the period of study was from July 2020 to June 2022 [4]. Dean et al. had studied 229 cases [9]. This variation in the number of cases per thousand autopsies is possibly due to regional variations and the influence of cultural and socioeconomic factors. [2] Hence, the present study is important for its high number of cases studied as compared to other studies, which makes it more unique in its nature. The present study also indicated the fact that 69.46% of the hangings were complete [n = 364]. These results are close to the observations made by Dinesh Rao [2], Sharma et al [11], Sai Sudheer and Nagaraja [12] and in their study, 71.9%, 68% and 64% of the cases, respectively, were due to complete hanging. However, these observations are contrary to those made by Dean et al. (2013). They observed that 83.4% [n = 229] of their cases were due to partial hanging [9]. All these observations highlight the regional influence, lifestyle, and, to a certain extent, the type of residence.

In the present study, males were the major victims, comprising 58.01% [n=304] of cases and females contributing 41.99% of cases. And the majority belonged to 21-30 years (33.58%; n = 176), and the least affected age group was those below the first decade. The observations are similar to Jayprakash and Sreekumar [10] and Sharma et al [11]. These observations are contrary to those made by Dinesh Rao [2]. This wider variation in the sex group is possibly due to the cultural, religious, economic and lifestyle factors driving the individual to Suicidal Hanging.

During present study, the ligature material was found insitu in only 300 [57.25%] cases in which nylon rope was found maximum in 104 [19.84%] cases followed by jute rope in 64 [12.21%] cases, this shows that in maximum number of cases the easily available and cheap materials like rope, cotton rope, synthetic saree was used to commit suicide. Similar to the claims made by Pateria D, Shrivastava M6and Ambade VN [13] These findings conflict with Patel AP et al who observed dupatta' was most commonly used ligature material (67.5 %). [14]

In the present study, Majority of the Position of the Knot 72.90 % (n - 382) of the victims were situated over the Nape of the Neck and only 27.09% [n=142] over placed over the Sides of the Neck, Similar to the claims made by Dinesh Rao who opined 77% (n - 488) of the cases were typical Hanging 2 These findings conflict with those of Sai Sudheer, Nagaraja [12], Sharma et al [11], who stated that 89% and 88% of the cases, respectively, were Atypical Hanging knot over the sides of neck]. One possible explanation for this could be that the victim tied the noose around his neck during the suspension period and then leaped over it. Another option is that the knot position changed during the last stages of hanging after suspension.

In the present study, the most common reason for hanging is family disputes (31.29%) (n = 164) of

cases), followed by love affairs (19.84%) (n = 104) cases. Similar to the claims made by Debnath J who opined 39.5% the most cause reason for hanging. [4]

Conclusion

This study highlights that suicide is a prevalent issue among young adults, who represent the most dynamic and productive demographic. It is often seen among male tea garden workers, typically occurring in familiar, comfortable settings using easily accessible materials. Suicide poses a serious health challenge, and the medical community has a crucial role in addressing it. With increased education, empathy, and a reduction in societal pressures, we can expect a decrease in the number of young people taking their own lives. Supporting their mental health and economic productivity can significantly benefit the economies of developing countries like India.

References

1. Kamei BK, Gangmei K, Kumari M, Mayanglambam. Trends of suicidal deaths brought to JNIMS mortuary: a five-year retrospective study. *Int J Health Res Med Leg Pract* [Internet]. 2022;8(1):5. Available from: <http://dx.doi.org/10.31741/ijhrmlp.v8.i1.2022.5>
2. Rao D. An autopsy study of suicidal hanging. *IP Int J Forensic Med Toxicol Sci*. 2021;6(3):108–12.
3. Ramtake AK. A study of deaths due to hanging: a retrospective study. *Indian J Forensic Med Toxicol*. 2024;18(2):9–12.
4. Debnath J, Basak AK. A study on hanging in 167 cases. *Cent Med Coll J* [Internet]. 2022 [cited 2024 Feb 28];6(2):77–81. Available from: <https://www.banglajol.info/index.php/CeMeCJ/article/view/67072>
5. Knight B, Saukko PJ. *Knight's forensic pathology*. Boca Raton: CRC Press, Taylor & Francis Group; 2016. p. 386–7.
6. Pateria D, Shrivastava M, Thakur PS, Singh BK, Soni SK. Autopsy-based one-year prospective study of death due to hanging. *Indian J Forensic Community Med*. 2020;5(4):240–4. <https://doi.org/10.18231/2394-6776.2018.0055>
7. Hassan AE, Ghaleb D, Kotb SS, Agamy H, Kharoshah MA. Suicidal hanging in Kuwait: retrospective analysis of cases from 2010 to 2012. *J Forensic Leg Med*. 2013;20(8):1118–39. <https://doi.org/10.1016/j.jflm.2013.09.021>
8. Kumar S, Verma A. A study of elderly unnatural deaths in medicolegal autopsies at Lucknow locality. *Med Sci Law*. 2013;54(3):127–31. <https://doi.org/10.1177/0025802413502783>
9. Dean DE, Kohler LJ, Sterbenz GC, Gillespie PJ, Gonzaga NS, Bauer LJ. Observed characteristics of suicidal hangings: an 11-year retrospective review. *J Forensic Sci*. 2012;57(5):1226–56. <https://doi.org/10.1111/j.1556-4029.2012.02230.x>
10. Jayaprakash S, Sreekumari K. Pattern of injuries to neck structures in hanging: an autopsy study. *Am J Forensic Med Pathol*. 2012;33(4):395–404. <https://doi.org/10.1097/PAF.0b013e3182662761>
11. Sharma BR, Harish D, Sharma A, Sharma S, Singh H. Injuries to neck structures in deaths due to constriction of the neck, with a special reference to hanging. *J Forensic Leg Med*. 2008;15(5):298–305. <https://doi.org/10.1016/j.jflm.2007.12.002>
12. Sai Sudheer T, Nagaraja TV. A study of ligature marks in cases of hanging deaths. *Int J Pharm Biomed Sci*. 2012;3(3):80–4.
13. Ambade VN, Tumram N, Meshram S, Borkar J. Ligature material in hanging deaths: the neglected area in forensic examination. *Egypt J Forensic Sci*. 2015;5(3):109–13.
14. Patel AP, Bansal A, Shah J, Shah KA. Study of hanging cases in Ahmedabad region. *J Indian Acad Forensic Med*. 2012;34(4):342–5.