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A RETROSPECTIVE STUDY OF HANGING CASES IN CENTRAL DELHI BASED ON AUTOPSY FINDINGS.

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ABSTRACT This study examines hanging-related deaths over a five-year period (January 2018 to December 2022) at LNJP Hospital New Delhi. Among 3,699 post-mortem cases, 169 (4.56%) were due to hanging. Most cases were aged 11-50 years (91.12%), with males (66.86%) and females (33.13%) affected. Common causes were financial issues, unemployment, and poverty. Married individuals accounted for 43.78% of cases. Hanging cases peaked in November and March. The majority occurred at residences (95.85%) and resulted in immediate death (95.85%). Nylon ropes were frequently used (40.23% males, sarees 20.11% females). Atypical hanging (88.16%) was more common than typical (11.83%). Ligature marks were mostly above the thyroid cartilage (89.34%) and parchmentized (100%). Physical signs included bluish discoloration, subconjunctival hemorrhage, and protrusion of the tongue. Internal exams showed larynx and trachea congestion (84.61%) and subcutaneous tissue showed whitish glistering underneath the ligature mark (87.57%). The primary cause of death was suicidal hanging (95.85% mechanical asphyxia, 4.14% hypoxic brain injury). This study offers insights into hanging-related deaths within a specific context.

KEYWORDS : Hanging, Suicide, Autopsy findings

INTRODUCTION

Asphyxia and neck compression resulting in death are common in forensic practice. In India, hanging is the most prevalent form of asphyxial death caused by the suspension of the body with a ligature around the neck. Hanging can be classified based on the mode (suicidal, homicidal, accidental, judicial), degree of suspension (complete or partial), and position of the knot (typical or atypical).[1]

According to Anton J. L. van Hoof, In prehistoric and pre-industrial communities, hanging was the most common method used for suicide.[2] The World Health Organization (WHO) estimates that 170,000 persons die by suicide in India each year, out of roughly 900,000 deaths worldwide.[3] However, India's National Crime Records Bureau (NCRB) estimated only 135,000 suicides in 2011.[4,5] Hanging is almost always suicidal, and accidental or homicidal hangings are rare.[6]

The distribution of age, gender, choice of ligature material, and autopsy results varies across regions due to factors like education, employment, happiness, and resource availability. This study aims to analyze the hanging case patterns specifically in Delhi.

MATERIAL AND METHODS

The Department of Forensic Medicine & Toxicology at MAMC & Associated Hospital Delhi conducted a five-year retrospective analysis of hanging-related deaths. The study encompassed the entire Central district and focused on medico-legal post mortems and unnatural deaths occurring from January 2018 to December 2022. The analysis involved studying post-mortem reports, police inquest reports, and panchanama reports. The main objective of this study was to examine the different characteristics of hanging-related deaths and compare the findings with existing literature on the subject.

OBSERVATION & RESULTS

During the Five-year period from January 2018 to December 2022, a total of 3,699 deceased individuals were brought to the LNJP Hospital New Delhi mortuary for post-mortem examination. Out of these cases, 169 (4.56%) were attributed to deaths by hanging. Among the hanging cases, the highest occurrences (44 cases, 38.93%) were observed among males aged 21-30 years, and among females, 25 cases (44.64%) were reported in the same age group. one case was reported in a male child at 10 years of age, while a total of 14 cases (8.28%) were found in individuals above the age of 51.

The most vulnerable age group for hanging was found to be between 11-50 years, accounting for 154 cases (91.12%). This period in one's life is often characterized by increased activity and productivity. The deaths were linked to various factors such as financial problems, livelihood burdens, unemployment, and poverty, which likely contributed to feelings of frustration and hopelessness.

A gender-wise analysis revealed that out of the 169 hanging cases, 113 (66.86%) were male and 56 (33.13%) were female. The age group of 21-30 years had the highest number of cases, accounting for 69 (40.82%), followed by the age groups of 31-40 years with 37 cases (21.89%), and 11-20 years with 31 cases (18.34%).(Table No 1)

Nearly half of the victims were married 74 cases (43.78%). The highest concentration of cases occurred in November, accounting for 20 cases (11.83%), followed by March with 19 cases (11.24) %. Conversely, December had the lowest number of cases at 9 cases (5.32%). The summer season (March to June) exhibited the highest instances of hanging (35.50%), while the winter season (November to February) had the fewest 50 cases (29.58%).

Of the total cases, 162 individuals (95.85%) took their lives at their residences, while the remaining seven cases (4.14%) were found hanging in diverse locations such as places of custody, tempos, guest houses, hotels, and factories. Out of these cases, 162 (95.85%) were pronounced dead upon arrival at the hospital, while the remaining seven cases (4.14%) were hospitalized for up to one week before death.

Regarding the ligature material used, nylon rope was the most common choice in 68 cases (40.23%), followed by sarees in 34 cases (20.11%), cotton dupattas in 19 cases (11.24%), cotton ropes in 9 cases (5.32%), bed sheets in 19 cases (11.24%), cable wires in 12 cases (7.1%), and electric wires in 8 cases (4.73%). Male victims mostly preferred nylon ropes, while female victims chose sarees and cotton dupattas.

Typical hanging, with the knot positioned behind the neck in the occiput region, was observed in only 20 cases (11.83%). Atypical hanging, with the knot on either the right or left side of the neck, was reported in 149 cases (88.16%).(Table No 2)

During the autopsies, 162 cases (95.85%) showed a single mark imprint of the ligature material, while 7 cases (04.14%) displayed

multiple marks. In 151 cases, (89.34%), the ligature mark was observed above the thyroid cartilage, while in 10 cases (5.91%) it was at the level of the thyroid, and in 8 cases (4.73%) below the thyroid cartilage. Ligature mark was parchmentized in all 169 cases (100%).

Various physical signs were observed during the autopsies, including bluish discoloration of nails, lips, and earlobes in 132 cases (78.10%), subconjunctival hemorrhage in 92 cases (54.43%), protrusion of the tongue in 112 cases (66.27%), and dribbling of saliva from the mouth in 119 cases (70.41%). Post-mortem lividity was noted on the back in 109 cases (64.49%), and on the legs in 60 cases (35.50%), depending on the time period of suspension. Seminal ejaculation was discovered in 28 cases (16.56%) cases, while discharge of urine and passing off of fecal matter was found in 34 (20.11%) cases. Hesitation marks were present in 8 cases (4.73%). (Table No 3)

Internal examination revealed congestion of the larynx and trachea in 143 cases (84.61%) . The tissue under the ligature mark appeared glistening white in 148 cases (87.57%). Hemorrhages in neck muscles, particularly in the sternocleidomastoid, were present in 32 cases (18.93%). In no case there was a fracture dislocation of the cervical vertebra. Tear in the intima of the carotid artery ,Hyoid bone fracture and thyroid cartilage fracture was found to be intact in all cases. Petechial hemorrhages present over lungs in 142 cases (84.02%). (Table no 4)

Suicidal hanging was the alleged cause of death in all 169 (100%) cases. Mechanical asphyxia was the cause of death in 162 instances (95.85%) and hypoxic brain injury in the remaining seven instances (4.14%)

DISCUSSION

In the current study, a total of 169 cases of hanging were examined [4.56%]. A similar number of cases were observed in a study conducted by Buchade DD et al[7], and Ahmad M. et al.[8] observed 145 cases of hanging during their study. Within this study, the age group of 21-30 years constituted the highest proportion at 40.82%. This age distribution was also observed in studies by Udhayabanu R et al.[9], Patel A.P. et al.[10], and Vijayakumari N et al.[11], with percentages ranging from 32.25% to 38.5%. The above findings are simply explained by the fact that people between the ages of 21 and 30 are more vulnerable to numerous frustrating situations in life, such as exam failure, study pressure, unemployment, marital quarrel, extramarital affair, and others.

The study indicated a predominance of male cases, accounting for 66.86% of the total. Similar sex distribution patterns were noted in studies by Udhayabanu R et al.[9] and Momin SG et al.[12], with male-to-female ratios varying between 1.5:1 and 2.0:1. In terms of ligature materials used, nylon rope was the most common choice (40.73%), while electric wire was the least preferred (4.73%). This differed from observations made by Udhayabanu R et al.[9] and Vijayakumari N et al.[11], where the most common ligature was Dupatta. However, study done in Ranchi by Kumar et al.[13] reported that hard ligature material such as rope was used most commonly.

In our research, on external examination ligature mark situated above the level of the thyroid cartilage in 89.34% of cases while in 5.91% & 4.73% cases ligature was situated at & below the level of thyroid cartilage respectively. This aligned with the results from Ballur's [14]study which found that 83% of cases had a ligature mark above the thyroid cartilage, and Sudheer and Nagaraja's[15] study which reported an 88% occurrence of ligature marks above the thyroid cartilage. In contrast, Naik and Patil's[16] study and Kumar et al.'s[13] study demonstrated lower occurrences, with 62% and 69% of cases respectively presenting ligature marks above the thyroid cartilage. In each case, the ligature mark was evident. Similar observations were made by Sudheer and Nagaraja[15], Ballur[14], and Kumar et al.[13] The ligature mark was also noted to be desiccated and hardened.

Our investigation revealed that the highest number of hanging-related deaths occurred in November, with 20 victims (11.83%), followed by March with 19 victims (11.24%), and February with only eight victims (4.73%). The summer season (July to October) accounted for the majority of cases, 60 (35.50%), while the winter season (November to February) saw the fewest cases, 50 (29.58%).

Of the total, 95.85% were declared dead upon arrival at the hospital, while seven cases survived up to seven days. This underscores the efficacy of hanging as a method of suicide.

Prominent postmortem findings included saliva dribbling, seen in 119 cases (70.41%), nail cyanosis in 132 cases (78.10%), and petechial hemorrhages on the lungs in 142 cases (84.02%). In 64.49% of cases, hypostasis was evident on the back of the body, indicating the prompt removal of the body from suspension.

In all 169 cases (100%), the hyoid bone remained intact. Our findings aligned with those of Patel et al.,[10] Naik and Patil,[16] Kumar et al.,[13] Yadav et al.,[17] Sudheer and Nagaraja,[15] Ballur,[14] Jayaprakash and Sreekumari,[18] and Meera and Singh,[19] who reported hyoid bone fracture rates of 5.2%, 1.6%, 4%, 4%, 2.7%, and 3.6%, respectively. Conversely, studies by Ahmad and Hossain,[8] Charoonnate et al.,[20] and Uzun et al.,[21] indicated higher occurrences of hyoid bone fractures in hanging cases. No cases exhibited thyroid cartilage fractures, in line with Kumar et al.'s[13] and Patel et al.'s[10] research. However, Jayaprakash and Sreekumari's study[18] documented thyroid cartilage fractures in 5.3% of cases.

In 95.85% of cases, the cause of death was mechanical asphyxia, while 4.14% of cases resulted in death due to hypoxic brain damage.

CONCLUSION

Hanging-related suicides pose a significant global public health concern, particularly in developing nations. Factors like physical ailments, mental health issues, marital conflicts, and economic hardships contribute to these tragic incidents either directly or indirectly.

A collective effort is needed from various quarters including law enforcement agencies, media professionals, social activists, healthcare practitioners, psychiatrists, NGOs, political leaders, governmental bodies, and individuals at large to uncover the underlying societal issues that lead to such tragedies. By doing so, we can prevent the heartbreaking loss of lives that affects both families and the broader community.

Table1: Age & Sex Wise Distribution

Age group	No	Male Percentage	No	Female Percentage	No	Total Percentage
0-10 yrs	1	0.88%	0	0%	1	0.59%
11-20 yrs	16	14.16	15	26.78	31	18.34
21-30 yrs	44	38.93	25	44.64	69	40.82
31-40 yrs	27	23.89	10	17.85	37	21.89
41-50 yrs	16	14.15	1	1.78	17	10.05
51-60 yrs	7	6.19	3	5.35	10	5.91
61 & above	2	1.76	2	3.57	4	2.36
Total	113	100	56	100	169	100

Table 2: Position of Knot

Occiput	Percentage	Right/left side of neck	Percentage
20	11.83	149	88.16

Table 3: Month-wise distribution of cases

Month	Cases	%
January	13	7.69
February	8	4.73
March	19	11.24
April	12	7.1
May	15	8.87
June	14	8.28
July	12	7.1
August	14	8.28
Septamber	15	8.87
October	18	10.65
November	20	11.83
December	9	5.32
Total	169	100

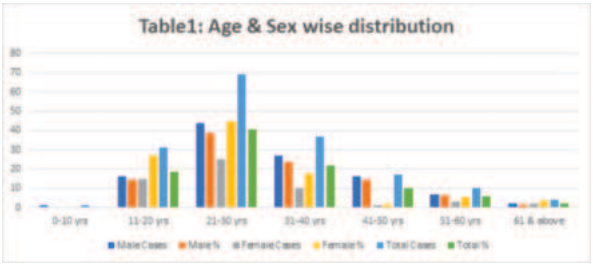
Table 3: Post-mortem findings on external examination

S. No.	External Findings	No. of victims	Percentage
1 ligature Mark	1-Single mark	162	95.85
	2-Multiple marks	7	04.14
2 Location	1-Above thyroid	151	89.34
	2-At thyroid	10	5.91
	3-Below thyroid	8	4.73

3 Face	1-Pale	12	7.10
	2-Congested	157	92.89
4 Tongue	1-Protruded & bitten	112	66.27
	2-Inside the mouth	57	33.72
5 Cyanosis of nails, fingers, lips, ear	Lobes	132	78.10
6 Postmortem Lividity	1-Back	109	64.49
	2-Legs	60	35.50
7 Dribbling of saliva		119	70.41
8 Sub-conjunctival hemorrhage		92	54.43
9 Discharge of semen		28	16.56
10 Discharge of urine & feces		34	20.11
11 Hesitation marks		8	4.73

Table 4: Post-mortem findings on internal examination

S. No.	Internal examination		No. of victims	Percentage
Normal			26	15.38
1	Larynx & Trachea	Congested	143	84.61
2	Tissue under ligature mark	1-Glistening white	148	87.57
		2-Normal	21	12.42
3	Neck muscles Hemorrhages in SCM muscle		32	18.93
4	Hyoid fracture	Absent	169	100
5	Thyroid Fracture	Absent	169	100
6	Tear in intima of carotid	Absent	169	100



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