

## Study of Profile of Ligature Materials used in Case of Hanging in Saphthagiri Institute of Medical Sciences & Research Centre, Bengaluru

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### Abstract

**Background:** Hanging (self-suspension) is that form of asphyxia which is caused by suspension of the body by a ligature which encircles the neck, the constricting force being the weight of the body. The person will use any article readily available for this purpose, like a rope, metallic chains and wires, leather strap, belt, bed sheet, scarf, dhoti, saree, turban, sacred thread, etc. The Doctor who performs the autopsy should note whether the mark on the neck corresponds with the material alleged to have been used in hanging, and if it is strong enough to bear the weight and the jerk of the body.

**Methods:** The present prospective study is done in the Department of Forensic Medicine & Toxicology, Saphthagiri Institute of Medical Sciences & Research Institute, Bengaluru for a period of 6 months considering the inclusion and exclusion criteria.

**Results:** During our study period, a total of 102 Autopsies were conducted in the Department of Forensic Medicine and Toxicology, Saphthagiri Institute of Medical Sciences, Bengaluru. In this study, the incidence of Hanging is 33.33% (34 out of 102). Males outnumbered the female with a male: female ratio of 10:3 with highest incidence of hanging being noticed in the age group of 16-30 years (62%). Soft material (77%) was the most commonly used ligature material than the hard one.

**Conclusion:** To conclude, this study will educate and provide awful information for the Investigating Officer (Police and Magistrate) in investigating cases of Hanging.

**Keywords:** Hanging, Autopsy, Ligature Material

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### Introduction

Hanging is a form of Asphyxial death due to constriction of the air passage at the neck, as a result of suspension of the body by a ligature in the form of a noose, applied in such a manner, when weight of the body or other part of the body e.g. head, acts as a constricting force<sup>1</sup>. When body is fully suspended and no part of the body touched the ground then it is called complete hanging, where constricting force is weight of whole body. On the other hand in incomplete hanging or partial hanging, the body is partially suspended, the toes or feet touching the ground or are in a sitting, kneeling, lying down, prone or any other posture with only head and chest off the ground<sup>2</sup>.

As hanging is commonly presumed to be mostly suicidal, the suicide usually hangs on the spur of moment with little premeditation, using any type of

ligature available at hand. Articles used as a ligature may be rope made of cotton, or, coconut fibre, or jute etc. or Dhoti, Saree, Turban, Bed-sheet, Sacred-thread, Handkerchief, Neck-tie, Cord of pajamas or dressing gowns, Belts, Braces, Scarves, Boot-lace, Towels, or Gamcha, Torn pieces of wearing apparels, Metallic chains, Wires, Leather strap etc. Dhoti, Saree, Curtain etc. may be torn into strips & used as ligature. In short, the material can be anything handy and available near place of occurrence as the suicide is an impulse mediated act. All cases of hanging are considered to be suicidal until the contrary is proved<sup>3,4</sup>.

**Symptoms:** The first symptom is the loss of power and subjective sensations, such flashes of light and ringing and hissing noises in the ears. These are followed by loss of consciousness, which is so rapid that hanging is regarded as a painless form of death. Owing to this rapid unconsciousness, an effort at saving oneself is not possible in case of accidental or suicidal hanging. In case of judicial hanging, convulsive movements of the limbs caused by anoxia may be seen. Respiration stops before the heart, which may continue to beat for about 10 to 15 minutes.

**Cause of death:**

1. Asphyxia
2. Venous congestion
3. Combined Asphyxia and Venous Congestion
4. Cerebral Ischaemia (Anoxia)
5. Shock
6. Fracture or Dislocation of the Cervical Vertebrae<sup>3</sup>

**Fatal period:** Death is almost instantaneous, if the cervical vertebra is fractured as in judicial hanging. It may occur instantaneously or rapidly in cases of asphyxia, but usually in five to eight or ten minutes if the blocking of the air passages is only partial. Death is, as a rule, slow in cases of venous congestion<sup>3-5</sup>.

### Methods and Materials

The present prospective study was done in the Department of Forensic Medicine & Toxicology, Saphthagiri Institute of Medical Sciences & Research Centre, from 27<sup>th</sup> January 2014 to 27<sup>th</sup> July 2014, for a period of 6 months considering the inclusion and exclusion criteria.

### Inclusion criteria:

1. All age groups.
2. All cases of hanging reported to the department of forensic medicine and toxicology, Saphthagiri Institute of Medical Sciences & Research Centre, Bengaluru, during the study period.
3. Either of the genders.

### Exclusion criteria:

1. Decomposed cases.
2. Alleged history of strangulation.

A detailed history from the police & the relatives along with the pretested questionnaire with

variables regarding the type of Ligature Material, point of suspension, type of hanging, type & position of knot etc. were collected. The data obtained was analyzed using latest software.

### Results and Observation

During our study period, a total of 102 Autopsies were conducted in the Department of Forensic Medicine and Toxicology, Saphthagiri Institute of Medical Sciences, Bengaluru. Out of the 102 Cases studied, 45 cases were suicidal in nature and among these 34 were due to hanging. Among the 34 hanging cases, the details from 8 cases could not be obtained as the relatives did not give consent in providing the details. In this study, the incidence of Hanging is 33.33% (34 out of 102). Among the 26 cases studied, 20 (76.92%) were male & 6 (23.07%) were female, whereas in the remaining 8 cases the relatives refused to give the details. It is clear that in our study, males outnumbered the female with a male: female ratio of 10:3. Highest incidence of Hanging (Table 1) in this study was noticed in the age group of 16-30 years (62%) followed by 31-45 years age group (23%). Soft material (77%) was the most commonly used ligature material (Table 2) than the hard one. Amongst the soft materials, 'saree' was the most commonly used material in majority of the cases (46.15%). The present study also revealed that the type of knot (Table 3) in majority of the cases (85%) was fixed & in very few cases (11%) it was found to be 'running' type. Regarding the place of hanging (Table 4), in majority of the cases (88%) closed places like living room was chosen as place of hanging. In more than half of the cases (85%) the point of suspension (Table 5) was found to be ceiling fan. The most common type (Table 6) of hanging in this study was observed to be 'Atypical' type (69.23%).

**Table 1: Shows age-wise distribution of cases**

Age group (in years)	1-15	16-30	31-45	45-60	>60
Cases	0	16	6	4	0
Percentage	0%	62%	23%	15%	0%

**Table 2: Shows type of ligature materials used in the study**

Ligature material	Hard material	Soft material				
	Rope	Bedsheet	Dhupatta	Saree	Piece of cloth	Others
No. of cases	06	1	2	12	5	0
Percentage	23.07%	03.84%	07.69%	46.15%	19.23%	0

**Table 3: Shows type of knot in the present study**

Type of knot	Fixed	Running	Others
No. of cases	22	3	1
Percentage	84.61%	11.53%	03.84%

**Table 4: Shows place of hanging in the present study**

Place of hanging	Living room	Outside (Tree)	Others (showroom)
No of cases	23	2	1
Percentage	88.46%	07.69%	03.84%

**Table 5: Shows point of suspension among the cases studied**

Point of suspension	Ceiling fan	Iron rod	Tree branch	Others
No of cases	21	3	2	0
Percentage	80.76%	11.53%	07.69%	0

**Table 6: Shows type of hanging among the cases studied**

Type of hanging	Typical hanging	Atypical hanging
No. of cases	8	18
Percentage	30.76%	69.23%

## Discussion

In the present study, out of the 102 cases studied, 45 cases were suicidal in nature and among these 34 were due to hanging. Among the 34 hanging cases, the details from 8 cases could not be obtained as the relatives did not give consent in providing the details. In this study, the incidence of Hanging is 33.33% (34 out of 102). It is clear that in majority age groups males' outnumbered female with a male: female ratio of 10:3. Similar findings were noted in studies conducted by Patel AP et al<sup>5</sup> in which incidence of hanging was 4.65% (320 out of 6880) & Ahmed M. et al<sup>6</sup> which studied 145 cases of Hanging out of which 60 (41.37%) were male & 85 (58.62 %) were female. Highest incidence of Hanging in our study was noticed in the age group of 16-30 years, which is supported by studies conducted by Patel AP et al<sup>5</sup> & Ahmed M. et al<sup>6</sup> who also found nearby results with highest incidence amongst the population of 15-25 years & 20-30 years respectively. The reason for increased incidence among these age groups may be due to the Academic failure, Inter-personal conflicts, Love failure and other financial crisis which are encountered during these periods.

In the present study, 'Saree' was the most common ligature material used which accounts to 46.15%. Running type of knot was the most common type with ceiling fan being the most common point of suspension. These finding are similar to studies conducted by Patel AP et al<sup>5</sup>, Ahamed M. et al<sup>6</sup>, Pradhan A et al<sup>7</sup>, Bhoshle SH et al<sup>8</sup>, Sharma BR et al<sup>9</sup>, Momin SG et al<sup>10</sup>.

The probable reason for 'saree' being the most common ligature material is because of the easy availability in every home in our country and that it can sustain one's weight. Ceiling fan is chosen as the most common suspension point because it can withstand the

weight of the person and available in almost every living room in the house.

## Conclusion

To conclude, this study will educate and provide awful information for the Investigating Officer (Police and Magistrate) in investigating cases of Hanging. By studying the choice of point of suspension one can know the mental status or mind set of the individual who had the intension to hang. This study will also educate about the ease of an individual in opting for that particular ligature material.

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**Conflict of Interested: None**

**Ethical Clearance: Taken from the Ethical Committee from the Institute**

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## Reference

1. JB Mukherjee's Forensic Medicine & Toxicology. 4<sup>th</sup> Edition, INDIA: Academic Publishers; 2011:p.504, 510.
2. Biswas H, Islam MR and Das TC. Case Report, Medicolegal, Legal and Social Issues in a Case of Hanging. Dinajpur Med Col J 2009 Jan;2(1):32-36.
3. Modi. A textbook of Medical Jurisprudence and Toxicology. 24<sup>th</sup> Edition 2012, INDIA: LexisNexis; 2012: p.445-46.

4. KrishanVij. Textbook of Forensic Medicine & Toxicology. 5<sup>th</sup> Edition, INDIA: ELSEVIER; 2012:p120.
5. Patel AP, Bansal A, Shah JV, Shah KA. Study of Hanging Cases in Ahmedabad Region. *J Indian Acad Forensic Med* Oct-Dec 2012;34(4):342-45.
6. Ahmad M, Hossain MZ. Hanging as a Method of Suicide Retrospective Analysis of Postmortem Cases. *JAFMC* Dec 2010;6(2):37-9.
7. Pradhan A, Mandal BK, Tripathi CB. Hanging: Nature of ligature material applied and type of hanging according to point of suspension. *Nepal Med Coll J* 2012;14(2):103-106.
8. Bhosle SH, Batra AK, Kuchewar SV. Violent Asphyxial Death Due To Hanging: A Prospective Study. *Journal of Forensic Medicine, Science and Law, A Journal of Medico legal Association of Maharashtra* Jan-Jun 2014;23(1):2-7.
9. Sharma BR, Harish D, Virendar PS, Preminderjeet S. Ligature Mark On Neck: How Informative? *J Indian Acad Forensic Med* 2005;27(1):10-15.
10. Momin SG, Hari MM, Hetal CK, Vijapura MT, Bhuva SD. Pattern of Ligature Mark in Cases of Compressed Neck in Rajkot Region: A Prospective Study. *J Indian Acad Forensic Med.* Jan- March 2012;34(1):41-3.