

## Profile of Ligature Materials, Knots and Types of Suicidal Hanging in Tertiary Care Hospital – Postmortem Centre.

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**Abstract:** A Prospective study on hanging was done, which included 155 consecutive cases of hanging, at Indira Gandhi Government General Hospital, Pondicherry, from September 2011 - March 2013. The main objective of this article was to ascertain the profile of ligature material, knot & the type of suicidal hanging. In this study, males constituted bulk of the cases (70.3 %) & the age group of 20 - 40 years was noted to be the most affected age group. Nylon materials (74.82%) were the most commonly used ligature material. Running knot (28.38 %) & single turn of ligature (89.67%) was the commonest. Complete hanging (76.19%) cases were more than partial hanging cases. Among the partial hanging cases feet touching the ground, was the most common posture noted.

**Keywords:** Hanging, prospective study, ligature material, type of knot, type of hanging

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### I. Introduction:

Death by ligation of neck has been in practice from the time immemorial. Earlier, it was a homicidal method, but with progression of civilization, ligation has been adopted for suicides also. Of all the methods of ligation of neck, hanging is one of the leading cause of death in the world, accounting for more than one million deaths annually.<sup>1</sup> It is also the oldest and most widely used method of execution in the world today.<sup>2</sup> At present, hanging cases are most commonly, suicidal and rarely, accidental and homicidal.<sup>3</sup> Virtually, all hanging cases are considered suicidal, unless otherwise proved.<sup>4</sup> Globally, hanging is the most common method of committing suicide. Also, in India hanging is one of the top five methods of choice for committing suicide.<sup>5</sup> The reason appears to be that, the materials necessary for the act are relatively easily available to the average person, compared to a firearm or a lethal poison. Also, hanging results in quick death for the victim and there is no cost involvement due to the easy availability of the ligature material.<sup>1</sup> In hanging, the ligature material depends on the accessibility and availability of means. Various ligature materials are being used, like nylon rope, cotton rope, metal wire, cable wire, synthetic saree, cotton saree, dhoti, lungi, synthetic dupatta, cotton dupatta, etc

### II. Subjects And Methods

This study was done in Indira Gandhi government general hospital, Pondicherry from September 2011 to March 2013. Data and history were collected from the police and the relatives of the deceased. The findings were noted from the body of the deceased and incorporated with the proforma which has been prepared already and containing information like age, sex, occupation, type of hanging, type of ligature material and knot types and marks, etc. **Inclusion criteria:** All cases of violent asphyxial death due to hanging. Hanging cases belong to both sexes and all age groups. **Exclusion criteria:** Asphyxial death other than hanging, for example, strangulation, throttling and bodies showing advanced decomposition. This is a descriptive study and the data was analysed using descriptive statistics and presented in the form of tables, figures, and graphs. In this study, descriptive statistics- percentage and ratio analysis were used.

### III. Results

This study was done for a period of one and half years to study the pattern of ligature material and knot types in hanging cases. The total of 155 cases were recorded during the period.

The most commonly used ligature materials were nylon materials (saree, rope, dupatta) constituting 116 (74.83 %) cases. Among these, the majority had used sarees 74 (47.74 %) cases followed by nylon rope in 25 (16.12 %) cases and dhoti in 21(13.54 %) cases [**Table 1**].

With regard to the type of hanging, it was found that a majority of victims 113 (72.9 %) adopted a complete suspension mode. Whereas partial hanging was noted in 42 (27.09 %) cases [**Figure 1**].

It was noted that posture of the body, among 42 cases of partial hanging, feet touching cases were 32 (76.19 %), kneeling posture cases were 9 (21.42%) and sitting posture cases were 1 (2.38 %) [Table 2].

In this study, the position of knot was noted after the body was brought to the mortuary. Ligature material itself was mutilated (not present) in 101 (65.16) cases. Rest of the 54 cases, the most common site was the left side of neck 25 (16.12 %) cases, followed by the right side of neck 22 (14.19 %) cases. Front of neck was the least preferred position for the knot, found in only 1 (0.64 %) case [Figure 2].

In our study, atypical hanging was seen in 96.12% cases and typical hanging was found to be in 3.87% cases.

Regarding the type of knot, ligature material itself was not present in 101 (65.16) cases, while brought to the mortuary. Rest of the 54 cases, running knot was present in 44 (28.38 %) cases and the fixed knot was present in 10 (6.45 %) cases [Table 3].

Regarding number of rows of noose, single row of noose was present in 139 (89.67%) cases followed by multiple row of noose in 5 (3.22 %) cases and 11 (7.09 %) cases were not appreciable [Figure 3].

#### **IV. Discussion**

On eliciting detailed history from the police and the relatives, a majority of the victims have chosen ligature materials whichever was available during that period of time. Our study showed, the most commonly used ligature materials were nylon materials (saree, rope, dupatta) constituting 116 (74.83 %) cases. Among these, the majority had used sarees 74 (47.74 %) cases followed by nylon rope in 25 (16.12 %) cases and dhoti in 21 (13.54 %) cases. These findings were consistent with study of Vijayakumari N et al <sup>6</sup>, but dupatta was the most commonly used ligature according to Patel AP et al <sup>7</sup>, Naik SK et al <sup>8</sup>, Ahmad et Al <sup>1</sup>, but in the larger context similar to this study softer materials are being used commonly than the harder ones. In comparison to this study, the findings are different in other studies. But this could be because, suicide is often an impulsive act and most South Indian women commonly wear sarees instead of chudithar with dupatta. So, sarees are commonly noted in this study.

Regarding the type of hanging, as per the history given by the police or the relatives & scene of crime photos, it was found that a majority of victims 113 (72.9 %) adopted a complete suspension mode and 42 (27.09 %) cases adopted partial suspension mode. Similar findings were documented by Saisudeer T et al <sup>4</sup>, Samantha AK et al <sup>9</sup>. However, Charoonnate N et al <sup>10</sup> observed that majority adopted incomplete suspension mode, in study done in Thailand. It was found that compared to males, females chose partial suspension. Most of the males adopted complete hanging, probably explained by the ease of reaching higher places for tying the knot to the ceiling

It was noted that, the posture of the body in partial hanging, in a majority of cases in this study, had their feet touching the ground (76.19%), which is similar to the findings of Sai Sudeer T et al <sup>4</sup> (44%). Kneeling position cases were noted in 21.42% cases, but this finding is not consistent with study conducted by Sai Sudeer T et al <sup>4</sup>, who observed that sitting position was more common than kneeling suspension. The reason, a majority of cases of partial hanging in this study, had their feet touching the ground, was that the point of suspension was high, other than other possible reasons are faulty assessment by the victims, before the application of noose around the neck, stretching of the ligature material after suspension, and stretching of the neck after death.

In this study, the position of knot was also noted. Ligature material itself was mutilated (not present) in 101 (65.16) cases. Rest of the 54 cases, the most common site was the left side of neck 25 (16.12 %) cases, followed by the right side of neck 22 (14.19 %) cases. Front of neck was the least preferred position for the knot, found in only 1 (0.64 %) case. Similar findings documented in Sharma BR et al <sup>11</sup> and Sai Sudeer et al <sup>4</sup>. However Ahamed et Al <sup>1</sup> and Talukder MA et al <sup>12</sup> observed the knots on the right side of the neck (41.51% census). Front and back of the neck were the least preferred position of the knot in many of the cases.

In this study, atypical hanging was seen in 96.12% cases and typical hanging was found to be in 3.87% cases. Similar findings were noted by Talukder MA et al <sup>12</sup>. Regarding the type of knot, ligature material itself was not present in 101 (65.16) cases. Rest of the 54 cases, the commonest type of knot applied was the running knot 44 (28.38 %) cases and the fixed knot was present in 10 (6.45 %) cases. The findings are not consistent with Meera TH et al <sup>5</sup> and Sharma BR et al <sup>11</sup>. 139 (89.67%) of the cases had single turn of ligature and 5 (3.22%) cases had double ligature. Similar findings were noted by Sarangi MP et al <sup>13</sup> and Meera TH et al <sup>5</sup>. The possible reason could be in most of the cases, the ligature material was long and strong enough to suspend the victim with a single turn.

#### **V. Conclusion**

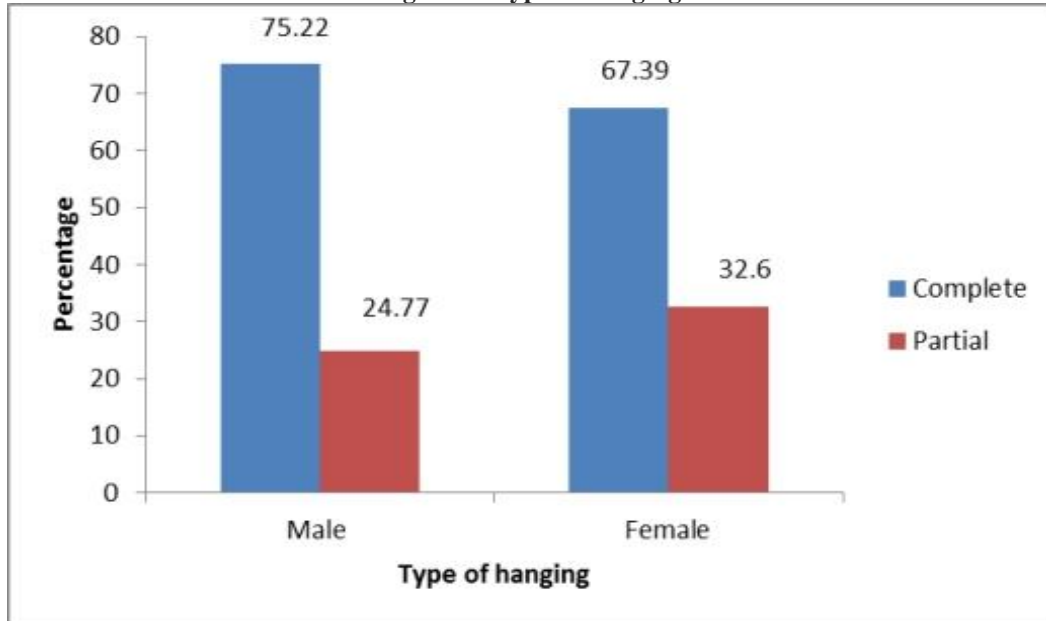
Hanging offers quick, effective and relatively pain free death. Young people mostly resort to hanging using easily available clothes especially, sarees and softer materials. Although technically different, both complete and partial hanging techniques are equally effective. Death, is most commonly seen in young people, leading to loss of production and economy and lives. This should be prevented. Main strategies to reduce

hanging should focus the prevention of suicide in controlled environments. The family members should support the victims, whenever in emotional crisis, mental illness issues and suicidal ideation

**Table 1: Ligature material used by victim**

Ligature material	Male		Female		Total	
	No	%	No	%	No	%
<b>Hard material</b>						
Nylon rope	22	20.18	3	6.52	25	16.12
Cotton rope	6	5.50	0	0	6	3.87
Metal wire	2	1.83	0	0	2	1.29
Cable wire	1	0.91	0	0	1	0.64
<b>Soft material</b>						
Synthetic saree	47	43.11	27	58.69	74	47.74
Cotton saree	1	0.91	3	6.52	4	2.58
Dhoti	20	18.34	1	2.17	21	13.54
Lungi	4	3.66	0	0	4	2.58
Synthetic dupatta	5	4.58	12	26.08	17	10.96
Cotton dupatta	1	0.91	0	0	1	0.64
<b>Total</b>	109	100	46	100	155	100

**Figure 1: Type of hanging**



**Table 2: Posture of the body in the partial hanging**

Posture of the body	No	%
Feet touching	32	76.19
Kneeling	9	21.42
Sitting	1	2.38
<b>Total</b>	<b>42</b>	<b>100</b>

Figure 2: Position of knot in hanging cases

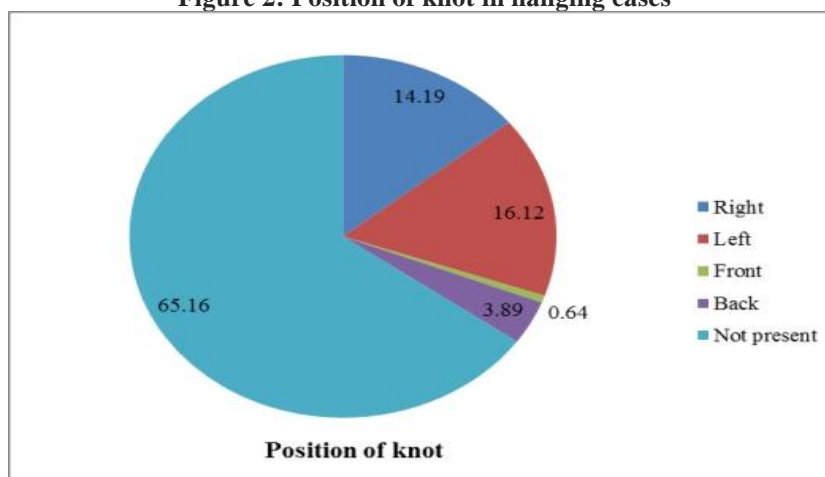
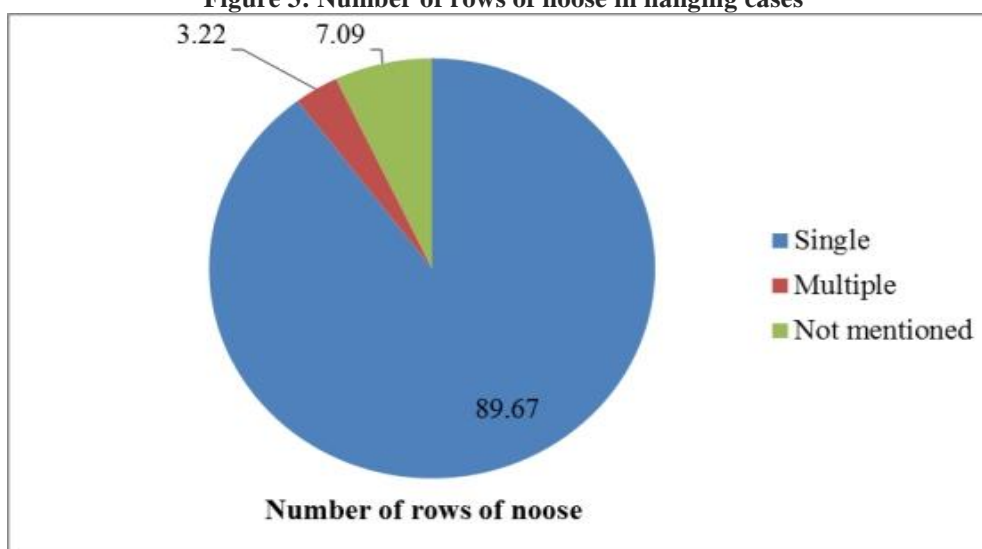


Table 3: Type of knot in hanging cases

Type of knot	No of cases	%
Fixed knot	10	6.45
Running knot	44	28.38
Not present	101	65.16
<b>Total</b>	<b>155</b>	<b>100</b>

Figure 3: Number of rows of noose in hanging cases



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