

Original Research Article

# The study of pattern of ligature marks and manner of death in Hanging at Solapur Region

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## Abstract:

**Aim:** To evaluate patterns of ligature marks and manner of death in all hanging deaths.

**Material and Methods:** The present prospective study carried out at the post mortem center in the department of Forensic Medicine and Toxicology, Dr. V. M. Government Medical College, Solapur. wherein 316 cases of hanging out of total 2958 cases brought for medico legal autopsies were studied during the period from October2019-June2021.

**Results:** Out of 316 cases of hanging maximum no of cases were of age group of 21-30 years. i.e. 85 cases (26.89%) followed by 31-40years. i.e. 79 cases (25%) cases. Male to female ratio was 3.93:1. Sari was the commonest type of ligature material used for hanging in 85(27%) of cases. All most all cases were suicidal in nature. In 27 (8.54%) cases ligature material was in situ. Typical hanging was observed in 265 (83.87%) cases in which position of knot was found behind the neck on occiput region, while in 51 (16.13%) cases it was atypical hanging in which position of knot present either on right or left side of neck. Fixed noose was present in 62 cases (19.62%) and running noose in 8 (2.53%) cases, where as it was not ascertained in 246 (77.89%) cases due to absence of ligature mark. Imprint of ligature material in the form of single mark was found in 282 (89.24%) cases, two imprints in 27 (8.54%) cases, while multiple marks of ligature material were noted in 7 (2.21%) cases. Ligature mark was complete in 11(3.48%) cases and incomplete or intermittent in 305 (96.51%) cases.

**Conclusion:** bread and butter earning reproductive age group of 20 to 40 years was most vulnerable to suicidal tendency by means of Hanging due to financial problems, frustration of unsuccessful life, love and extra marital affairs, job insecurity, familial disharmony, etc. due to which they terminated their lives at very early stages. Presence or absence of circumstantial evidence in the form of suicide notes is mere an obsolete finding and it does not confer suicidal intent in related case. In all such cases autopsy surgeon had performed proper meticulous post mortem to rule out any foul play or suspicious death, putting an end to the rumours arising especially in minds of next of kin and also helping out police officials in doubtful case

## 1. INTRODUCTION

“Death is certain for all living beings, but only humans end their lives prematurely by committing suicide”<sup>1</sup> Among various methods opted for committing suicides, hanging is one of the most common. In today's modern and civilized world, Hanging is being practiced since the advent of ancient civilization. Hanging is almost always suicidal in manner, only in

few instances it may be accidental or homicidal, the former (Suicidal manner) being by far the most common.<sup>2</sup> Hanging is one of the top ten leading causes of death in the world accounting for more than a million deaths annually.<sup>3</sup> Although Hanging is committed only by adults and in adolescents, children have an increased risk for injury or death from accidents for a variety of reasons compared to adults. Nevertheless, accidental hangings are still very uncommon in the paediatric population.<sup>4-5</sup> Hanging is one of the popular modes of suicides in India since time immemorial for its simplicity, availability of objects and in terms of efficacy.<sup>6</sup> Hanging 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.<sup>7</sup> Hanging is preferred over other methods of ending life as it produces painless death for the victims and there is no cost involvement other than that of ligature material. Post-mortem examination in cases of hanging provides sufficient evidence to ascertain the cause and the manner of death. Ligature mark on the neck is the most important and specific sign of death from asphyxia due to hanging or other means. Autopsy surgeons are frequently subjected to clarify the manner of death in suspicious deaths by concerned police officials. General external appearances, local external neck findings, neck autopsy and neck histological changes play a major role in differentiation between types of hanging (suicidal, accidental or homicidal). Most common type being suicide hanging, whereas homicidal and accidental hanging are only rarely documented.<sup>8</sup> Our present study was conducted at department of FMT, Dr.V.M.GMC, Solapur to evaluate pattern of ligature mark and manner of death in all hanging deaths

## 2. MATERIALS AND METHODS

The present prospective study carried out at the post mortem center in the department of Forensic Medicine and Toxicology, Dr.V.M.Government Medical College, Solapur, wherein 316 cases of hanging out of total 2958 cases brought for medico legal autopsies were studied during the period from October 2019 to June 2021

**Procedures followed:** All medico legal cases (Total 2958 cases) referred to the forensic medicine department of our tertiary care centre for autopsies were studied. Out of these 316 cases were of Hanging and included in our study. Crime scene photographs, Investigating Police officer's records (Inquest Panchnama and requisition letter) and information provided by relatives of deceased were recorded in details. Autopsies were conducted and External findings of the ligature mark were described and photographed. Detailed characteristics patterns of ligature mark and its relation with ligature material and manner of death noted.

**1. Inclusion Criteria-**All cases of alleged death due to hanging or cases in which typical ligature mark of hanging was present on neck region.

**2. Exclusion criteria-** **A)** All cases with ligature mark on neck but due to cause of death other than hanging were excluded from this study. **B)** All pathological/ clinical autopsies **C)** Suspected Hanging by ligature which was done to conceal other cause of death or was a part of foul play.

Collected data was compiled and entered in Microsoft Excel Sheet 2016. Appropriate test was applied wherever necessary. The data was analyzed for the socio demographic factors such as Age, gender etc

## 3. OBSERVATIONS AND RESULTS

Total 2958 autopsies were conducted during the study period, out of which 316 (10.68%) cases were of hanging.

**Table No. 01: Age and gender wise distributions of cases**

Age (years)	Number of cases		Total (%)
	Male (%)	Female (%)	
0-10	2 (0.79%)	0 (0.00%)	2 (0.63%)
11 to 20	27 (10.71%)	11 (17.1%)	38 (12.02%)
21-30	63 (25%)	22 (34.37%)	85 (26.89%)
31-40	66 (26.19%)	13 (20.31%)	79 (25%)
41-50	45 (17.85%)	6 (9.37%)	51 (16.13%)
51-60	27 (10.71%)	5 (7.81%)	32 (10.12%)
61-70	16 (6.34%)	4 (6.25%)	20 (6.32%)
71-80	6 (2.38%)	2 (3.12%)	8 (2.53%)
>80	0(0.00%)	1 (1.56%)	1 (0.31%)
<b>Total</b>	<b>252</b>	<b>64</b>	<b>316</b>

Table no. 1 shows that out of total 316 cases maximum number of cases were recorded in the age group of 21-30 years 85 (26.89%) followed by 31-40 years 79 (25%) cases. Two cases were found in the age group 0-10 years (5years and 7 years old male) which were a part of suicidal pack in the family of four members.

Out of the total 316 cases, 252 (79.74%) were males and 64 (20.25%) females. Male to female ratio was 3.93:1. It was observed that male victims outnumbered females in all age groups indicating male predominance.

**Table No. 02: Ligature material used for hanging**

LIGATURE MATERIAL	Male		Female		Total	
	Cases	%	Cases	%	Cases	%
Nylon Rope	68	91%	7	9%	75	24%
Shela (male neck cloth)	3	75%	1	25%	4	1%
Odhani (female neck cloth)	22	58%	16	42%	38	12%
Cotton material	10	91%	1	9%	11	3%
Sari	68	80%	17	20%	85	27%

Coconut Rope	21	88%	3	13%	24	8%
Shawl	3	100%	0	0%	3	1%
Electric wire	5	100%	0	0%	5	2%
Others	7	88%	1	13%	8	3%
Not ascertained	45	71%	18	29%	63	20%

Table number 02 depicts the type of ligature material used by the victims. Sari was the commonest type of ligature material used for hanging in 85(27%) of the cases, followed by nylon rope in 75(24%) cases. However Nylon rope as a ligature material for hanging was preferred by male in 68 cases, but sari or cotton dupatta were preferred by female victims in 17 and 16 cases respectively.

**Table No. 03: Distribution of cases based on manner of neck compression**

Manner of neck compression	Number of cases (Percentage)		
	Males	Females	Total
Suicidal	249(98.80%)	64(100%)	313(99.05%)
Homicidal	2(0.79%)	0(0.00%)	2(0.63%)
Accidental	1(0.39%)	0(0.00%)	1(0.31%)
<b>Total</b>	<b>252</b>	<b>64</b>	<b>316</b>

As far as manner of death is concerned in our study all cases were of suicidal in nature except two cases of children less than ten years who were part of dyadic death in which husband had strangulated his wife and hanged both of his children and finally hanged himself and one case reported was of accidental hanging of male while working got entangled in chains and wires leading to death by partial hanging.

**Table No. 04: Distribution of cases based on presence suicide note**

SUICIDE NOTE	MALE		FEMALE		TOTAL	
	Cases	%	Cases	%	Cases	%
Present	2	0.79%	1	1.56%	3	0.95%
Absent	250	99.21%	63	98.44%	313	99.05%
<b>TOTAL</b>	<b>252</b>	<b>100%</b>	<b>64</b>	<b>100%</b>	<b>316</b>	<b>100%</b>

In present study circumstantial evidence in the form of suicide note was present in only three cases which included 02 males and one female. However mere presence of suicide note

was not considered as evidence of hanging and thorough post mortem was conducted to rule out any possibility of any other cause of death in such cases

### No. 05: External Post Mortem Examination findings

Sr. No.	Characteristic	Description	Number of Cases		Total cases (% out of 316)
			Male	Female	
1	Ligature Material	In situ on Neck	21	6	27(8.54%)
		Present but Removed	33	19	52(16.45%)
		Absent	198	39	237(75%)
2	Position of Knot	Typical	213	52	265(83.87%)
		Atypical	39	12	51(16.13%)
3	Noose	Fixed	45	17	62(19.62%)
		Running	6	2	8(2.53%)
		Not Ascertained	201	45	246(77.84%)
4	Circumference	Complete	10	1	11(3.48%)
		Incomplete	242	63	305(96.51%)
5	Direction	Oblique	247	61	308(97.46%)
		Horizontal	5	3	8(2.53%)
6	Depth	Shallow	118	46	164(51.89%)
		Deep	134	18	152(48.10%)
7	Number	One	227	55	282(89.24%)
		Two	20	7	27(8.54%)
		Multiple	5	2	7(2.21%)
8	Thyroid level	Above	244	58	302(95.56%)
		At Thyroid	6	5	11(3.48%)
		Below	2	1	3(0.95%)

Table number 05 shows distribution of various findings seen on external examination at the time of post mortem. It was found that ligature materials used for hanging was present in situ on the neck region in 27 (8.54%) cases, removed by relatives or by the police officials in 52 (16.45%) cases but presented at the time of post mortem or later on and was absent in 237 (75%) cases.

Typical hanging was observed in 265 (83.87%) cases in which position of knot was found behind the neck in occiput region, while atypical hanging in which position knot present either on right or left side of neck was reported in 51(16.13%) cases. In doubtful cases where position of knot was not found appreciable to the naked eye, after dissection of neck region it was determined whether it was typical or atypical hanging.

Fixed noose was present in 62 (19.62%) cases, running noose in 8 (2.53%) cases whereas it was not ascertained in 246 (77.84%) cases due to absence of ligature material. Imprint of ligature material in the form of single mark was found in 282 (89.24%) cases, two imprints in

27 (8.54%) cases, while multiple marks of ligature material were noted in 7 (2.21%) cases. Ligature mark was complete in 11(3.48%) cases and incomplete or intermittent in 305 (96.51%) cases.

In maximum 308 (97.46%) it was placed obliquely and running upwards and backwards towards the occiput, whereas it was horizontal in 8 (2.53%) cases but all post-mortem findings were consistent with hanging. IN most cases 164 (51.89%) cases mark was shallow and in 152 (48.10%) it was deep in nature. In most 302 (95.56%) cases of hanging ligature mark was noted above the thyroid cartilage while in 11 (3.48%) and 3 (0.95%) it was found at and below the level of thyroid cartilage respectively.

#### 4. DISCUSSION AND CONCLUSION

In our present study it was observed that cases of hanging accounted for 316 (10.68%) of all cases (2958) brought for Medico legal autopsies in this institute.

Similar incidence of death due to hanging was noted in study done by **Mohammed Musaib M.Shaikh et al**<sup>9</sup> reported 90 (8.78%) cases of compression of neck by ligature either due to hanging and **Mishra PK<sup>10</sup> et al** reported 113 cases (10.39%) of deaths due to hanging . **Jagtap NS, Patekar MB, Pawale DA<sup>11</sup> (July 2020)** reported 443 (12.91%) cases were death due to hanging. But Comparatively lower rate (%) of cases of hanging as compared to our study were reported by study carried by **Sharma BR<sup>12</sup> et al** deaths due to hanging constituted 3.4%. and 542 (6.95%) cases by the study done by **Chourasia N, Pandey SK, Mishra A<sup>13</sup> . Ambade VN, Tumram N and Meshram S (2015)<sup>14</sup>** in their study in Nagpur reported hanging in 4.1% cases. Maximum number of cases 85 (26.89%) were recorded in the age group of 21-30 years followed by 31-40 years 79 (25%) cases in our present study. **Meera T and Singh M<sup>15</sup>** reported similar findings that maximum cases were in 21-30 years (25%) followed by 31-40 years(22.62%). **Vijayakumari N et al<sup>16</sup>** study showed commonest age group involved was 21-30yrs (38.5%). **Patel A P, Bansal A, Shah J V, Shah K A et al<sup>17</sup>** study in Ahmedabad reported that age group of 21-30 years comprised of 40% cases. **Bhosle SH, Batra AK, Kuchewar SV<sup>18</sup>** in Yawatmal district of Maharashtra reported maximum cases in the age group of 21-30 years (41.67%) followed by age group 31-40 years (20.24).

However even though third decade of life is most commonly involved followed by fourth decade as seen in our study, few studies reported fourth decade or fifth decade being most commonly involved in such cases: **Nikolic S. et al<sup>19</sup>** retrospective analysis of 175 autopsies of suicidal hanging at the Institute for Forensic Medicine in Belgrade from January 1997 to January 2002 revealed that age ranged between 10 and 87 years with mean age 47.33 years (SD, 17.51 years; median, 47.00 years). Retrospective study done by **OMA Madni et al<sup>20</sup> (2010)** on 133 suicidal hanging cases autopsied at Forensic Medicine Center in Dammam, Kingdom of Saudi Arabia (from 2003 to 2007) reported an increasing trend of hanging between 21 and 50 years (88.7%) with fourth decade constituting highest number of victims (about 36%) in between all age groups. **Taktak S et al<sup>21</sup> (2015)** study done in Istanbul reported average age of the victims was 37.8 (SD 1.6). In our study bread and butter earning reproductive age group of 20 to 40 years was most vulnerable to suicidal tendency by means of Hanging due to financial problems, frustration of unsuccessful life, love and extra marital affairs, job insecurity, familial disharmony, etc. due to which they terminated their lives at very early stages. Maximum cases of males were reported in the age group 31-40 years 66 (26.19%) followed by 21-30 years in 63 (25%) cases. However amongst female age group 21-30 years 22 (34.36%) cases were highest followed by 31-40 years 13 (20.31%) cases. Similar finding were reported by **Vijayakumari N et al<sup>16</sup>** that Majority of suicidal hanging by males was in the age group of 31-40 years (21.6%) and 21-30 years in the female (24.6%).

**Mishra PK et al<sup>23</sup> (March 2018)** study done in Indore reported majority of victims belonged to 3rd decade among males (24.77%), followed by 4th decade (17.70%), while 2nd decade was most common among females (15.04%), followed by 3rd decade (12.39%). In contrast to our finding **Shrivastav M et al<sup>22</sup>** reported maximum cases 25 (12.3%) cases in the age group of 21-30 years in males. **Meera T and Singh M et al<sup>15</sup>** found male accounted for 77.38% of the cases as compared to 22.62% females with Male: Female ratio was 3:1. Male as to female ratio showed almost equitable distribution of cases amongst males and females in study done by **Vijayakumari N et al<sup>16</sup>** at the Madras Medical College, Chennai, India wherein 65 cases of deaths due to suicide by hanging were studied in which **52.3% cases were men and 47.7% women.**

In present study circumstantial evidence in the form of suicide note was present in only three cases which included 02 males and one female.

In **Vijayakumari N et al<sup>16</sup>** prospective study it was found that suicide note was left behind in only five cases out of total 65 cases. **OMA Madni et al<sup>20</sup>** in Soudi Arabia found that previous history of psychological illnesses was documented in 19 cases (14.28%) and stressful family problems in 6% of cases. Previous suicidal attempts were present in only one case. Suicidal note was found in seven cases.

Presence or absence of circumstantial evidence in the form of suicide notes is mere an obsolete finding and it does not confer suicidal intent in related case. In all such cases autopsy surgeon had performed proper meticulous post mortem to rule out any foul play or suspicious death, putting an end to the rumours arising especially in minds of next of kin and also helping out police officials in doubtful cases.

Ligature materials used for hanging was present in situ on the neck region in 27 (8.54%) cases, removed by relatives or by the police officials in 52 (16.45%) cases but presented at the time of post mortem or later on and was absent in 237 (75%) cases. Typical hanging was observed in 265 (83.87%) cases and atypical hanging in 51(16.13%) cases. Fixed noose was present in 62 (19.62%), running noose in 8 (2.53%) whereas it was not ascertained in 246 (71.84%) cases. Single mark was found in 282 (89.24%), two imprints in 27 (8.54%) cases, while multiple marks of ligature material were noted in 7 (2.21%) cases. Ligature mark was complete in 11(3.48%) cases and incomplete or intermittent in 305 (96.51%) cases.. In 308 (97.46%) it was placed obliquely and running upwards and backwards towards the occiput, whereas it was horizontal in 8 (2.53%). In 164 (51.89%) cases mark was shallow and in 152 (48.10%) it was deep in nature. In 302 (95.56%) cases ligature mark was noted above the thyroid cartilage while in 11 (3.48%) and 3 (0.95%) it was found at and below the level of thyroid cartilage respectively.

Similarly in England **Bennewith O et al<sup>23</sup>** (2005) reported that in half of the cases (52%) victims fully suspended with both feet off the ground. **Sharma BR<sup>12</sup>** reported completely contrasting finding of maximum cases with multiple knots in (61%) and fixed knots in (58%) cases. But the Ligature mark was obliquely placed (98% cases) above the thyroid (85% cases) as seen in our study. In contrast of our study **Uzun I et al<sup>24</sup>** reported that suspension was complete in **364** of these cases which was almost equal to incomplete in **397 cases.** **Ambade VN et al<sup>25</sup>** found fixed type of knot was noted in 64.6% and running (slip) noose in 21.3% cases which is against the findings reported in present study. Number of turns/loops of ligature around the neck was one in 72.4% and two in 25.2% hanging deaths. Complete hanging was seen in 67.7%. But typical hanging was noted in only 10.2% cases as seen in our study. **Suarez-penaranda et al<sup>26</sup>** found type of Suspension (complete vs. incomplete) was known in 194 cases in which complete hanging represented 62.4%. This finding is against the results obtained in our study. However cases with fixed knot in (65.4%), running knot in 21.5% cases and in 13.1% data was not recorded was similar as seen in our study. In contrast

to our study **Meera T and Singh M**<sup>35</sup> reported that complete and atypical hanging was seen in 88.10% of the cases and partial hanging in only 8.33% and typical hanging in only 3 (3.57%) cases. But their findings of 36 cases (57.14%) in which cotton cloth was used as a ligature material which were either scarf, towel, khudei, etc. and 42.86% used ropes- nylon or jute and were present in situ or brought for examination in 1/3rd of cases were against to that seen in our study. **Bhosle SH et al**<sup>18</sup> results of their study revealed that fixed noose was present in 30 (35.71%) cases; out of which 12 (40%) cases showed complete ligature mark and 18 (60%) cases incomplete mark, running noose in 29 (34.52%) cases; of which ligature mark completely encircling in 15 (51.72%) cases. Ligature mark was above the level of thyroid cartilage in 70 (83.33%) cases, at the level of thyroid cartilage in 13 (15.47%) cases and below thyroid cartilage in 01 (01.19%) case. In 83 (98.81%) cases the ligature mark was passing obliquely upward whereas it was horizontal in only 01 (01.19%) case. Ligature mark was deep and grooved in 65 (77.38%) cases and shallow in 19 (22.38%) cases. All of the above findings are similar to our study except that in 52 (61.90%) cases they observed that the ligature mark was incomplete and in 32 (38.10%) cases, ligature mark was completely encircling neck. **Kumar J, Kumar M and Gupta M**<sup>27</sup> reported atypical hanging in 74.45% cases and typical hanging cases 24.32% which is not similar to that in our study. Running nooses present in (68.61%) and fixed knot in (31.38%) as compared to fixed knot in our study. Ligature mark was discontinuous 126 (91.97%) and continues ligature mark in remaining 11 (8.02%) cases. All these findings are against that reported in our study except that the marks were oblique in 129 cases (94.16%) and horizontal in rest 8 (5.83%). In study done by **Dekal V et al**<sup>28</sup> most cases were atypical (95.6%) and complete hanging (90.3%) against the findings in our study but finding of ligature mark situated above the thyroid cartilage was similar to that in our study. **Chowdhury B**<sup>29</sup> reported that out of total of 264 cases atypical ligature marks with partial hanging cases outnumbered typical ligature mark with complete hanging. This finding was not consistent with the results obtained in our present study. However single ligature mark was observed in the maximum number of cases as compared to multiple marks as seen in results of our study. In study done by **Ozer E et al**<sup>30</sup> typical hanging was determined in 42 (87.5%) cases, similar to our study. **Uzun I et al**<sup>24</sup> found that complete hanging was almost equal to the number of incomplete cases out of 761 hanging cases. In contrast our study they also reported that ligature mark was completely encircling the neck in only 3% cases and cases of complete suspension of body were maximum in our study. **Jagtap NS, Patekar MB and Pawale DA**<sup>11</sup> reported typical hanging in 43 [12.53%] cases while atypical hanging - with knot on right or left side in 132 (38.48%) and 115 (33.52) cases respectively. In 53 [15.45%] cases position of knot was not found appreciable. Most of these findings were not in accordance with our study. Single mark was found in 296 (86.29%) cases while multiple marks of ligature material were noted in 47 (13.70%) most 321 (93.58%) cases of hanging ligature mark was noted above the thyroid cartilage while in 15(4.37%) and 7(2.04%) cases it was found at the level of thyroid and below as found in our study.

In our study type of ligature material used was Sari for hanging in 85 (27%) of the cases, followed by nylon rope in 75 (24%) cases. Gender wise nylon rope as a ligature material for hanging was preferred by male in 68 cases, but sari or cotton dupatta were preferred by female victims in 17 and 16 cases respectively

Findings of ligature material used for hanging were same in study done by **Udhayabanu R et al**<sup>31</sup> in which they reported similar finding of synthetic saree (47.74 %) being the most commonly used ligature material by hanging victims. In study done by **Jayaprakash S and Sreekumari K (2012)**<sup>32</sup> it was found that soft material (77%) was preferred as ligature material than the hard one. Easily available materials in victims household were used as



ligature materials. In Surat by **Chandegara P et al**<sup>33</sup> too reported that most common ligature material used was dupatta as it is soft, easily available material for hanging. In South India at Tirupati in study done by **K Jyothi Prasad et al**<sup>34</sup> chunni was the commonest material used in 25(31.12%) cases. In Bangaluru study of **Yadukul S, Kamal A, Shivakumar BS, Shankar U**<sup>35</sup> it was found that soft materials such as saree, shawl, lungie, and so on were used as ligature by 47% of victims and hard materials such as coir rope, plastic rope, telephone cable, and so on were used by 29% of victims. Other than dupatta various studies showed rope in any form was commonest ligature material: **Ambade VN et al**<sup>25</sup> reported commonest type of ligature material used for ligation around the neck was nylon rope followed by odhni and jute rope. **Rahman ZM**<sup>36</sup> study done in 2013 reported maximum number of victims 134 (43%) used ropes as ligature materials. **Ambade VN et al (2015)**<sup>14</sup> reported that hanging was complete in 67.7% with nylon rope as the commonest type of ligature material used for ligation. **Das KC et al**<sup>37</sup> in their study in Jorhat, Assam reported ligature material was nylon rope (50.36%) followed by cotton rope (29.14%), metal. In Contrast to Sari in our study, dupatta or chunni was more commonly preferred ligature material in studies done by: **Patel A P, Bansal A, Shah J V, Shah K A**<sup>17</sup> in their study divided ligature material into hard - e.g., electric /nylon wire, rope etc. and soft - e.g., dupatta, bed- sheet, saree etc. in which they reported that 'dupatta' was most commonly used ligature material (67.5 %) as it is easily available in almost every house.

As far as manner of death is concerned in our study all cases were of suicidal in nature except two cases of children less than ten years who were part of dyadic death in which husband had strangulated his wife and hanged both of his children and finally hanged himself and one case reported was of accidental hanging of male while working got entangled in chains and wires leading to death by partial hanging. Similarly in Spain **Suarez-penaranda et al**<sup>26</sup> reported that all cases were of suicidal hanging except two cases of accidental origin in children (Crib death). Study was done on hanging with specific emphasis on cases of accidental hanging by **Dogan et al**<sup>39</sup>(2010) at the Konya Branch of the Forensic Medicine Council (Turkey) between 1998 and 2007 where hanging was involved in 201 (6.5%) cases. They reported 13 cases of accidental hanging in which children were involved 12 cases. In seven cases the accidental hanging involved a scarf that wraps around swing- like cradles and is intended to prevent infants from falling down. **Ranjbar MR et al**<sup>40</sup> study reported that suicide was manner in 101 (97%) corpses and according to primary scene investigations and autopsy findings three (3%) cases were highly suspicious of non-suicidal events which eventually were clarified with the help of toxicology tests. **Kurtulus A et al**<sup>41</sup> in their five years study found that all cases were of suicidal hanging. **Bhosle SH, Batra AK and Kuchewar SV**<sup>18</sup> study on total 84 cases of asphyxial death due to hanging from October 2008 to June 2010 in Department of Forensic Medicine and Toxicology, at Shri Vasantrao Naik Government Medical College, Yavatmal district of state (Maharashtra) found most of the cases were suicidal in nature (98.81%). Only one case of homicidal hanging was observed during their study period and victim was female. It was a case of dyadic death where newly married female was hanged by her husband and later he committed suicide by hanging as was seen in our study where husband killed his wife and hanged both their children and finally himself. **Arif M et al**<sup>42</sup> in their study reported manner of death in cases hanging was mostly suicidal (90.24%). **Das KC et al**<sup>37</sup> reported nature of hanging in all 429 cases was suicide. In study done in Nepal by **Atreya A, Nepal S, Kanchan T**<sup>43</sup> it was found that based upon the circumstantial evidences 95.61% (n=87) cases attributed to suicide in nature. **Jagtap N S, Patekar M B, Pawale DA**<sup>11</sup> in their study on 443 hanging cases (12.91%) out of total medico legal autopsies conducted in Kolhapur district of Maharashtra State found manner was suicidal in origin in all cases of hanging.

In view of the increasing magnitude of such cases being reported daily, many more research works are still being conducted with the use of modern diagnostic and imaging techniques at present in different regions worldwide in which new significant results are anticipated

## 5. REFERENCES:

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