

## ORIGINAL RESEARCH

### Evaluation of pattern of hanging cases in Gwalior district of Madhya Pradesh: An original research

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#### ABSTRACT

**Aim:** The purpose of the present research was to assess the patterns of hanging cases in Gwalior district of Madhya Pradesh.

**Methodology:** Present prospective study of hanging cases was carried out at Mortuary of Forensic Medicine & Toxicology department, Gajra Raja Medical College, Gwalior (M.P) between Jan 2020 – Dec 2021. A total of 4291 cases were autopsied of which 495 cases were of hanging which were included in the present research. The findings were recorded and analysis was done to find out age and sex distribution, type of hanging, level of ligature mark, type of ligature material used and reasons of suicide etc.

**Results:** In the present study 31 to 40 year was the most commonly involved age group followed by 21-30 years and 41-50 years in which male outnumbered the female. Complete hanging was seen in 75% deaths. Nylon rope was the most commonly used material for hanging. Evidence of salivary stains around the angle of mouth was present in 36.56% of the cases. In 78.18% of cases the ligature mark was present above the level of thyroid cartilage. The most common reason for hanging deaths was the family disputes (42.82%). The incidence of hanging was more common in Married people than unmarried people.

**Conclusion:** Middle age group population between 31–40 years are more susceptible victims of suicides by hanging which constitutes about 31.31% of total cases.

**Keywords:** Suicide; Hanging; Autopsy, Demographic variables.

#### INTRODUCTION

Hanging is the form of asphyxial death which is caused by suspension of the body by a ligature material compressing the neck externally and the constricting force being the weight of the body itself. Hanging is always considered suicidal except accidental hanging in sexual pervers, homicidal hanging in lynching and justifiable judicial hanging. <sup>1</sup> The most common method of self-suspension involves attaching the suspending material (rope, string, sari, chunni, wearing apparel, etc.) to a high point such as fan or ceiling beam, etc., and the lower end may be formed into a 'fixed loop or running noose' and is placed around the neck. The victim stand on the chair/stool/table or some other support and either jumps or kicks away the support and gets suspended. The hanging is most common type of asphyxia death and it

isone of the leading methods of committing suicide. It is one of the leading causes of death in the world accounting more than a million deaths annually.<sup>2</sup> It is one of the most common methods used by victim for committing suicide. Among the young adults the incidence of hanging is going on increasing.<sup>3</sup> Slight force is enough for causing death rather than whole weight of the body. In case of partial hanging only the head and chest are off the ground, with partial suspension of the body and the toes or feet touching the ground, or body being in lying down position, kneeling down position or acquire any posture.<sup>4</sup>

### AIM OF THE PRESENT STUDY

The purpose of the present research was to assess the patterns of hanging cases in Gwalior district of Madhya Pradesh.

### METHODOLOGY

Present prospective study of hanging cases was carried out at Mortuary of Forensic Medicine & Toxicology department, Gajra Raja Medical College, Gwalior (M.P) between Jan 2020 – Dec 2021. A total of 4291 cases were autopsied of which 495 cases were of hanging which were included in the present research. Information regarding age, sex, residence, marital status, date of death, reasons of suicide, and all other relevant information about the case had been collected from the accompanying police papers and detail history from the relatives of the victim. All the victims who died of violent asphyxial deaths other than hanging were excluded in the study. The findings were recorded and analysis was done to find out age and sex distribution, type of hanging, level of ligature mark, type of ligature material used and reasons of suicide etc. The data was studied statistically using percentage and ratio analysis and finally inferences were made. This study was carried out by taking permission from the Institutional Ethical Committee.

### RESULTS

It was observed in the study that 282 (55%) victims were males and 213 (45%) cases were females. Age group of 31-40 years was most commonly involved which accounts for 155 (31.31%) cases, followed by 21-30 years 142 (28.6%) and 41-50 years 94 (18.98 %) cases. (Figure 1) In this study, ligature mark was found above the thyroid cartilage in 387 (78.18%) cases, below the thyroid cartilage in 16 (3.23%) cases and at the level of thyroid cartilage in 92 (18.58%) cases. It is evident that rope was most commonly used as ligature materials for hanging which constitutes 195 (39.39%) cases followed by dupatta in 176 (35.55%) cases. (Table 2) In the present study, familial disputes were the most common reason for committing suicide which was found in 212 (42.82%) cases. (Table 3) Mostly the knot was seen in the right side of neck of the cases which was around 233 (47.07%) (Table 1) and maximum had congestion of face in about 354 cases (71.51%) followed by salivary stains in 181 (36.56%) cases. (Figure 2)

**Table 1: Distribution of cases on the basis of position of knot**

| Position of Knot    | No. of cases | Percentage   |
|---------------------|--------------|--------------|
| Left side of neck   | 158          | 31.91 %      |
| Right side of neck  | 233          | 47.07 %      |
| Occipital area      | 66           | 13.33 %      |
| Front of neck /Chin | 38           | 7.67 %       |
| <b>TOTAL</b>        | <b>495</b>   | <b>100 %</b> |

**Table 2: Distribution of cases in relation to type of ligature material used**

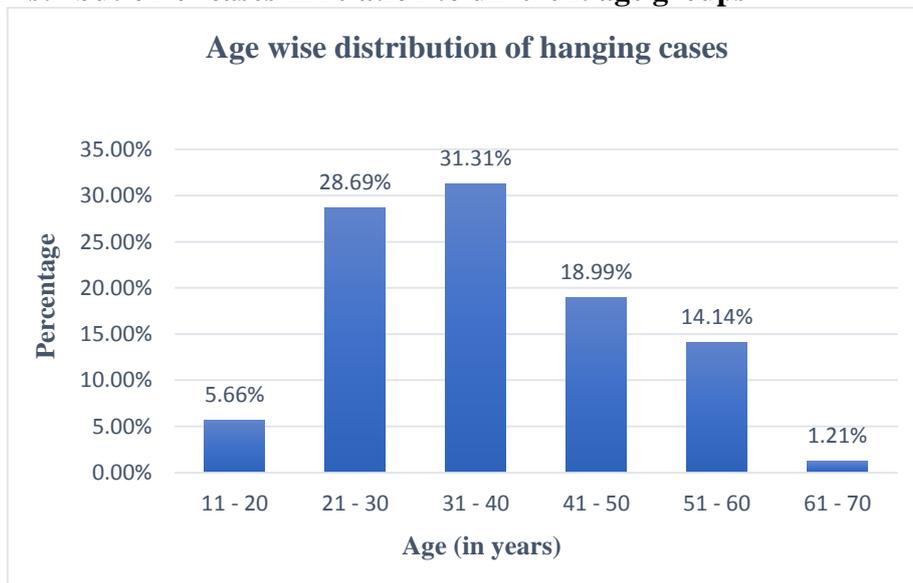
| Ligature material | No. of cases | Percentage |
|-------------------|--------------|------------|
| Rope              | 195          | 39.39 %    |

|              |            |              |
|--------------|------------|--------------|
| Dupatta      | 176        | 35.55 %      |
| Saree        | 81         | 16.36 %      |
| Cable wire   | 26         | 5.2 %        |
| Lungi        | 17         | 3.4 %        |
| <b>TOTAL</b> | <b>495</b> | <b>100 %</b> |

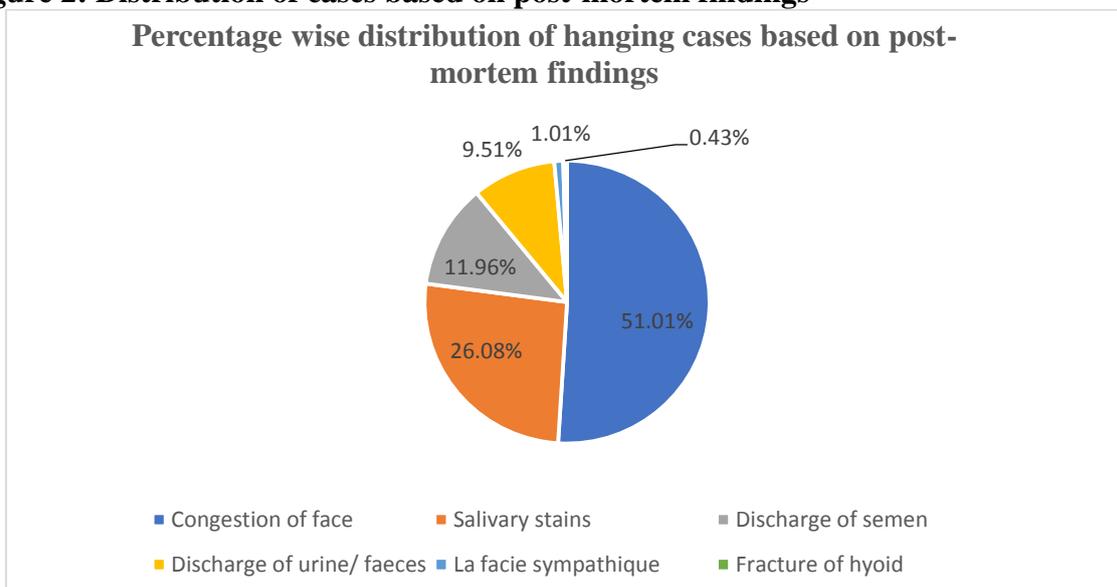
**Table 3: Distribution of cases on the basis of reason for death**

| Reason             | No. of cases | Percentage   |
|--------------------|--------------|--------------|
| Financial Problems | 138          | 27.87 %      |
| Family disputes    | 212          | 42.82 %      |
| Mental Illness     | 33           | 6.66 %       |
| Personnel affairs  | 46           | 9.29 %       |
| Not Known          | 66           | 13.33 %      |
| <b>TOTAL</b>       | <b>495</b>   | <b>100 %</b> |

**Figure 1: Distribution of cases in relation to different age groups**



**Figure 2: Distribution of cases based on post-mortem findings**



## DISCUSSION

This prospective study is conducted over a period from January 2020 to December 2021. During this period, a total of 4291 autopsies were conducted of which 495 deaths were of hanging in all autopsies. A similar study conducted by Dinesh Rao over years 2010 to 2013 at Bangalore showed an incidence rate of 3.31% cases of total autopsies conducted<sup>5</sup> which was consistent with the present study. Two-year study by Dekal V, Shruthi P shows the incidence rate of hanging rate 27.9% of total autopsies.<sup>6</sup> Dr. Amit Yadav, Dr. Divyesh Saxena et al. study in Indore for a period of 2012-2013 shows the incidence rate of hanging deaths 30.28% of total autopsies.<sup>7</sup> Mohit Shrivastava<sup>1</sup>, P.S. Thakur et al study, conducted between 2017-2018 reported the incidence of hanging death 9.2%.<sup>8</sup> A 10-year study between the period in 2003-2013 by Der EM, Dakwah IA, Derkyi-Kwarteng L et al reveals the incidence of hanging death 0.34% in Ghana.<sup>9</sup> The present study found a predominance of male victims (55 %) over female victims (45 %) and the most common age group affected was 31-40 years (31.31%) followed by 21-30 years (28.6 %). Findings in the present study are consistent with Mohit Shrivastava<sup>1</sup>, P.S. Thakur et. al.<sup>8</sup> study and which also found the predominance of male victims (67.5%) over female victims (32.5%) and the most common age group affected was 21-30 years (35.9%) followed by 31-40 years (25.1%). Additionally, findings of Der EM, Dakwah IA et. al.<sup>9</sup> study shows the predominance of male victims over female victims and the most common age group affected was 20-29 years (28.7%) followed by 30-39 years (25.1%). Dr. S. Ranjan Bajpai<sup>10</sup> study reveals the similar findings and shows the predominance of male victims and the most common age group affected was 21- 30 years followed by 31-40. Another study by Patel- Ankur P, Bhoot-Rajesh et al.<sup>11</sup> shows the similar findings to the present study showing the predominance of male victims (64%) and the most common age group affected was 21-30 years (42.66%). Similar findings were observed in Ravdeep Singh, Anupinder Thind et al.<sup>12</sup> study is consistent with the present study showing the predominance of male victims and the most common age group affected was 21-30 years (35.42%) followed by age group 31-40 years (33.33%). However, findings of the present study are not consistent with Dinesh rao<sup>5</sup> study which shows the predominance of female victims and most common age group affected was 31-40 years followed by 21-30 years. The unmarried victims constitute 25.6 % cases and married victims constitute 75.34% cases of hanging in the present study. Findings of this study were consistent with Dinesh Rao<sup>5</sup> study shows 70.45% of victims were married and 29.55% victims were unmarried. The most common position of knot found in the present study was the right side of the neck (47.07%) and the least common position of the knot was in front of neck/below the chin (7.67%). Finding of this study was consistent with Dekal V, Shruthi P<sup>4</sup> study, Dr. Amit Yadav, Dr. Divyesh Saxena<sup>7</sup> study, Mohit Shrivastava<sup>1</sup>Thakur et al<sup>8</sup> study, Chand S, Solanki R et al.<sup>13</sup> Study which found similar evidence of common position of knot on right side of the neck. However, Ambade VN, Tumram N et al study<sup>14</sup> reveals the most common position of the knot was on the left side of the neck. The most common ligature material used for the hanging was a rope (39.39 %) followed by a dupatta (35.55%). These findings are consistent with Dinesh Rao<sup>5</sup> study which mentioned the most common ligature material was the dupatta followed by the sari. Patel- Ankur P, Bhoot-Rajesh R<sup>11</sup> study found that the most common ligature material used was dupatta followed by the bedsheet. Findings in the present study are not similar to Mohit Shrivastava<sup>1</sup>Thakur et al<sup>8</sup> study which described the most common ligature material used was the rope followed by sari. Der EM, Dakwah IA, Derkyi Kwarteng L et al.<sup>9</sup> study found that the most common ligature material was the rope followed by an electric cable wire. Ambade VN, Tumram N<sup>14</sup> et al. study reveals the most common material was nylon rope followed by a dupatta. The most common position of ligature mark in the present study was above thyroid cartilage (78.18%) followed by at thyroid cartilage (18.58%)

and the least common position of ligature mark was below the thyroid cartilage (3.23%). Findings of the present study are consistent with Rao D<sup>5</sup> study which reported the common position of ligature mark above thyroid in 82.58%, at the level of thyroid in 10.22% cases and below thyroid in 7.20% cases. Dekal V, Shruthi P<sup>15</sup> study found the place of ligature mark above the thyroid cartilage in 84.95%, at the level of thyroid in 8.41% cases and below the thyroid cartilage in 6.64% cases. Dr. Amit Yadav, Dr. Divyesh Saxena<sup>7</sup> study found the place of ligature mark above the thyroid cartilage in 87.2%, at the level of the thyroid cartilage in 7% cases and below the thyroid cartilage in 5.6% cases. Chand S, Solanki R, Aggrawal A<sup>13</sup> study found the place of ligature mark above thyroid in 50%, at the level of the thyroid cartilage in 48.07% cases and below the thyroid cartilage in 1.92% cases. Ravdeep Singh, Anupinder Thind<sup>12</sup> study found ligature mark above the thyroid cartilage in 73.95%, at the level of the thyroid cartilage in 26.04 % cases. The typical external post mortem finding of hanging in present study was facial congestion (71.51%), salivary stains in 36.56 % cases. Findings in the present study are consistent with Patel- Ankur P, Bhoot-Rajesh R<sup>11</sup> study which observed the white glistening under ligature mark in all cases (100%), neck muscle haemorrhage in 6.25% case. Rao D<sup>5</sup>, Dekal V, Shruthi P<sup>15</sup>, Chand S, Solanki R, Ravdeep Singh, Anupinder Thind<sup>12</sup> study observed the fracture of hyoid bone in 6.06%, 15.48%, 9.5%, 7.79% and 11.63% cases respectively.

## CONCLUSION

Middle age group population between 31–40 years are more susceptible victims of suicides by hanging which constitutes about 31.31% of total cases. Proper parental and social guidance and support could prevent suicides in this age group. Timely counselling of such vulnerable group of victims could prevent suicide. Effective prevention strategies are needed to promote awareness of the prevention of suicides.

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