

## Materials Used for Suicidal Hanging Recorded during Autopsy from Sir Salimullah Medical College Morgue

Md Syedur Rahaman Sumon<sup>1</sup>, Kishoara Binte Quader<sup>2</sup>, Moushumi Taher Asha<sup>3</sup>, Ferdows Ara Mollika<sup>4</sup>  
Mustafa Sumon Al Rashid<sup>5</sup>, Md Belayet Hossain Khan<sup>6</sup>, Farzana Ahmed<sup>7</sup>

### Abstract

**Background:** Suicide is one of the commonest causes of death worldwide and has a great public health effect. The cause of suicide is found to be multi-factorial in which biological, psychological, social and environmental factors act together. The choice of method depends on the accessibility and availability of the means on the spot at the time of act. **Objective:** To find out the choice of ligature material used by the victims, type of hanging in relation to the point of suspension and other related factors. **Materials and method:** This retrospective observational study summarizes the post mortem examinations on 187 cases of suicide by hanging during January 2012 to December 2013 in the Department of Forensic Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh. Ligature material used by the victim was noted from the available forensic reports. **Results:** The current study is done to find out the commonly used material in cases of hanging. Male (63%) outnumbered females (37%) in committing suicide by hanging. Most commonly used ligature material was rope (28%) followed by 'orna'/'dupatta' (22%). The nature of ligature material was soft in 68% cases while hard material was used in 5% cases. The position of knot was observed on left side of neck in 63% cases followed by right side in 21% cases. The commonly used ligature was a rope with guider, and ceiling fan and tree branches as the point of suspension. **Conclusion:** Rope is frequently used for domestic purposes and thus it is also the most commonly used ligature material. Social, cultural and economic values must be strengthened to reduce incidence of suicide.

**Key words:** Suicide; hanging; ligature mark; ligature material.

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### Introduction

Hanging is one of the ten leading causes of death in the world accounting for more than a million deaths annually.<sup>1</sup> The hanging deaths are one of

the most important asphyxial types of death which are encountered in day to day life by forensic pathologists.<sup>2</sup> It is a form of violent mechanical

1. Assistant Professor, Dept. of Forensic Medicine, Bashundhara Ad-din Medical College, Dhaka, Bangladesh.
2. Assistant Professor, Dept. of Forensic Medicine, Delta Medical College, Dhaka, Bangladesh.
3. Assistant Professor, Dept. of Anatomy, Bashundhara Ad-din Medical College, Dhaka, Bangladesh.
4. Lecturer, Dept. of Microbiology, Sapporo Dental College, Dhaka, Bangladesh.
5. Assistant Professor, Dept. of Forensic Medicine, Aichi Medical College, Uttara, Bangladesh.
6. Professor & Head, Dept. of Forensic Medicine, Sir Salimullah Medical College, Dhaka, Bangladesh.
7. Assistant Professor, Dept. of Forensic Medicine, Shahabuddin Medical College, Dhaka, Bangladesh.

**Correspondence:** Dr. Md Syedur Rahaman Sumon. e-mail: drsumonadib@gmail.com

asphyxial death in which force applied to the neck is derived from a gravitational drag of the body or part of the body.<sup>3</sup> In India, hanging is one of the common methods of committing suicide along with poisoning, burning and drowning and constituted 41.8% cases of suicides in 2014.<sup>4,5</sup> A review of data of 56 countries found that hanging was the most common method in most of the countries, accounting for 53% of the male suicides and 39% of the female suicides. According to WHO, highest incidence of hanging was found to be 90.6% in Kuwait and 83.1% in Lithuania among the total number of suicide cases.<sup>6,7</sup>

Asphyxia in hanging results from compression or constriction of the neck structures by a noose or other kind of structure around the neck tightened by the weight of the body.<sup>8</sup> Hanging may be complete or partial depending on the position of the body at the time of hanging. In a hanging from high point of suspension when the body completely suspends above without touching the ground is called complete hanging while in a hanging from low point of suspension sometime some part of the body touches the ground is called incomplete or partial hanging. The type and position of knot play an important role in the causation of death in hanging.<sup>9</sup> The biological, psychological, socio-cultural economic, and environmental factors are responsible for the causation of hangings all over the world. These factors contribute to the opportunities and limitations of choice of ligature material to be used by the person for committing suicide. Rapid urbanization, industrialization and emerging nuclear family systems are resulting in social upheaval and distress.<sup>10</sup> Modern period has been a period of significant development and gradual changes were noticed in the society all over the world. The traditional methods of suicide did not change with the introduction of new technologies and advancement in the society in India and vary across country. In the modern era, internet usage is growing exponentially which is not only shaping our lives but altering our brain also. The applications of Wikipedia, blog, or social networking are being used extensively and the web postings have become the interactive and

self-initiated medium to acquire information about changing suicide trends in relation to methods used. In Bangladesh 'shari', 'orna'('dopatta'), 'lungi', nylon rope, belt, muffler, ropes are commonly available at home which can be used to hang themselves at any place and any time and table, stool, chair and cot are commonly used to reach the site of suspension. There are unique patterns of suicide methods in India that markedly differ from those of the West. This may be due to cross-cultural differences. In Western countries, dog chain, belt, electric cable, scarf, tie, dressing gown cord, shoe lace, etc., are used as ligature materials, which are not usually used in our country.<sup>11</sup> The present study was conducted with the objective to study the choice of ligature material preferred for hanging and the type of hanging in relation to the point of suspension and other associated factors.

## Materials and method

A retrospective study was done on the basis of 3rd copies of postmortem reports preserved in the department of Forensic Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka Bangladesh for the period of 2 years, (from January 2012 to December 2013) with the permission of the autopsy surgeons. A total of 187 cases of hanging were studied with respect to the ligature material used. The cases included in the study were the cases of death due to hanging, in which the postmortem examination was conducted in this department. The meticulous examination of ligature material was carried out in this study.

## Results

A total of 187 cases of suicidal hanging were reported within the period between 2012 and 2013. Age incidence was highest (40%) in between the age of 21-30 years. Sex distribution revealed 117(63%) males and 70(37%) females indicating a male: female ratio of nearly 2:1. Rope (nylon and jute) was the most common ligature material used in 53(28%) cases followed by

‘orna’/‘dopatta’ in 40(22%) cases and ‘shari’ in 21(12%) cases. Electric wire, clutch wire, ‘lungi’, ‘kamiz’ were other ligature materials used for hanging. And in 35(18%) cases ligature materials were unknown. The ligature material most commonly used for hanging was soft material in 129(68%) cases, firm material in 31(16%) cases, hard material in 10(5%) cases, and used materials were unknown in 17(9%) cases. The knot was observed on left side of neck in 117(63%) cases and on right side in 49(26%) cases and on nape of the neck/backside in only 21(11%) cases. Position of the ligature marks on above thyroid cartilage in 183(98%) cases, below thyroid cartilage in 2(1%) cases, and over the thyroid cartilage in 2(1%) cases. The ligature mark was placed obliquely around the neck in 185(99%) cases. The fracture of hyoid bone was observed in 9(5%) cases (Table I).

**Table I: Findings of the study (N=187)**

Studied variables	Frequency	Percentage
<b>Age (in years)</b>		
11-20	25	14%
21-30	75	40%
31-40	55	30%
41-50	20	10%
51-60	10	5%
>60	2	1%
<b>Sex</b>		
Male	117	63%
Female	70	37%
<b>Ligature materials</b>		
Rope(nylon, jute)	53	28%
‘Orna’(‘dopatta’)	40	22%
‘Shari’	21	12%
‘Lungi’	20	11%
‘Kamiz’	9	5%
Electric wire	8	4%
Unknown	35	18%
<b>Nature of ligature material</b>		
Soft	129	68%
Firm	31	16%
Hard	10	5%
Unknown	17	9%
<b>Relevant factors</b>		
<b>Position of the ligature mark</b>		
Above the thyroid cartilage	183	98%
Below the thyroid cartilage	2	1%
Over the thyroid cartilage	2	1%
<b>Direction of the ligature mark</b>		
Oblique	185	99%
Horizontal	2	1%
<b>Fracture of hyoid bone</b>		
Fractured	9	5%
Not fractured	178	95%

## Discussion

Hanging is one of the most common causes of suicide deaths in Bangladesh. The present study

revealed that majority of hanging deaths were among males with a male: female ratio of nearly 2:1, which was consistent with observations made by a good number of studies.<sup>2,3,8,12-16</sup>

The present study revealed that the commonest type of ligature material used for hanging was synthetic and jute rope in 53(28%) cases followed by ‘orna’/‘dopatta’ in 40(22%) cases. Similar findings were reported by Pradhan et al.<sup>8</sup>, Bhosle et al.<sup>17</sup>, Rawat and Rodrigues<sup>18</sup> and Ahmad and Hossain.<sup>19</sup> In Western countries belt, electric cable, scarf, tie, dressing gown cord, shoe lace, curtain cord, telephone cord, shower lead, etc. are used as ligature materials, which are not so used in our country<sup>11</sup> and this may be due to socio-cultural and geographical factors. The current study was compared with the other studies conducted in other parts of the world in relation to various incidences surrounding suicidal hanging. The results of the present study were contrary to the observations made by Nowers<sup>20</sup> who reported scarf, shoe laces, electric flex, wire cable and electric cable as ligature material. Cooke et al.<sup>21</sup> noticed rope as ligature material in 59% cases, James and Silcocks<sup>3</sup> reported rope, wire, chain, flex, belts and various soft ligatures, Simonsen<sup>22</sup> reported packing twine, electric cord, rope, linen, belt and others, Elfawal and Awad<sup>23</sup> observed plastic clothes line, cotton cloth, leather strap, silk cloth, rubber hose, and electric cable, Guarner and Hanzlick<sup>24</sup> reported ropes and belts, sheets, electric cords, shirts, towels, and linen clothes hanger, Davison and Marshall<sup>25</sup> reported rope, electric flex, belts, baler twine, and washing line and Lukeet al.<sup>26</sup> noticed, rope or clothes line, leather belt, soft belt or tie. The knot was observed on left side of neck in majority of cases and position of the ligature marks were on above thyroid cartilage in most of the cases. The present study highlighted the fact that the fracture of hyoid bone was observed in 9(5%) cases. The findings of the present study regarding hyoid bone were in concordance with the observations made by several previous studies.<sup>15, 17, 18, 26-32</sup> According to Modi<sup>33</sup> fractures of hyoid bones were rare. Whereas the study conducted by Smith and Fiddes<sup>34</sup> and Mukherjee<sup>35</sup> never found any fracture.

## Conclusion

The most common ligature material used by victim for hanging found in this study was rope followed by 'Orna'/'Dopatta'. The ligature material used in most cases is the easily available material found by the deceased in the vicinity of the scene of crime. Social, cultural and economic values must be strengthened to help reduce incidence of suicide.

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