ISSN (Print): 2663-9491 ISSN (Online): 2789-6897

Original Article

A Study of Hanging Cases in a Tertiary Hospital

DOI: dx.doi.org

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Received: 11 June 2023
Accepted: 25 June 2023
Published: 10 August 2023

Published by:
Sher-E-Bangla Medical College, Barishal, Bangladesh

ABSTRACT

Background: *When a person commits suicide by hanging themselves, they suffer death similar to that caused by severe hypoxia caused by the ligature material tightening around the neck structures and cutting off ventilation to the lungs.* ***Objective:*** *To evaluate the prevalence and causes of Hanging Cases in Sylhet Osmani Medical College Hospital.* ***Method:*** *A study on hanging victims at Sylhet Osmani Medical College from July 2015 to July 2017 was conducted retrospectively. The inquest report accompanying the dead bodies gathered data on 60 victims, including incidence locations, times, causes of death, suspension type, and related information from attendants.* ***Results:*** *Most participants were aged 21-30 and 66.67% were female. 35% of hangings were caused by marital discord. Dopatta was the top choice (50%) for ligature, with jute rope (18.3%) and shari (10%) following close behind. There were 43% on the right side, 40% on the left, 10% towards the back of the neck, and 7% under the chin.. Neck injuries were observed in most cases, including stretching and elongation in 70%, skin hemorrhage in 50%, and muscle hemorrhage in 40%. In 36.67 % of the patients, the platysma and sternocledo mastoid muscles ruptured. The majority of participants were right-handed. 50% of cases had a solitary ligature mark, while 33.33% had a double mark, and 10% had a barely visible one.* ***Conclusion:*** *Younger women were found to be more prone to suicide by hanging. It's the top cause of relationship turmoil. Most were right-necked and right-handed. Usually, patients have just one ligature mark. We require extensive research across multiple centers to ascertain our true*

(The Planet 2022; 6(2): 362-370)

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Keywords: *Hanging Cases, suicide, death case.*

INTRODUCTION

Suicide by hanging is the most common manner of self-inflicted death in the United States. Suicide by hanging is a form of severe asphyxia in which the person is suspended by a ligature material that constricts the neck tissues and limits the entry of air into the lungs. In the United States, suicide by hanging accounts for the majority of all suicide deaths [1-2]. The sole expense is the ligature material itself, and it leads to a swift and painless death for the victims. A thin jute rope around the neck will render the victim unconscious in under a minute [3]. Consequently, this method of suicide is the most popular in America. Several other South Asian countries also engage in these rituals [4-5]. Among the top 10 leading causes of mortality worldwide, suicide accounts for over a million deaths yearly due to its high prevalence [6]. Even in wealthy countries like Serbia, Norway, or Hungary, there are cases of people dying by hanging. [7–9] More than 2,000 people every year in England and Wales take their own lives by hanging themselves. [10] The term "complete hanging" is used to describe a situation in which a person's entire body is suspended from above without making contact with the earth. In contrast, partial hanging involves the suspension of only a piece of the body. [12] Uneven pressure on the various components of the neck can lead to a wide variety of injuries, making the location of the knot extremely important. Complete hanging poses a far greater risk of injury than partial hanging because the body's weight is not being supported by the ground.

When determining the cause of death, forensic experts place a premium on the presence of a fractured hyoid bone and/or thyroid cartilage, especially in cases involving neck constriction (such as hanging, manual constriction, or homicide by strangling).

OBJECTIVE

To assess the prevalence and causes of Hanging Cases in Sylhet Osmani Medical College Hospital.

METHODS & MTERIALS

This study looked retrospectively at data from the morgue at Sylhet Osmani Medical College, which collected data from July 2015 to July 2017. The inquest report that was found next to each of the 60 bodies included details about the victims, including their names, ages, places of death, possible causes of death, and the type of suspension used. During postmortem investigations, details such as the type of ligature used, the location of the knot, the pattern of ligature marks, the extent of injury to various structures in the neck (including the presence of hyoid bone and thyroid cartilage fractures as determined by visual and palpatory methods), etc. were recorded. The Forensic Medicine and Toxicology Department of Sylhet Osmani Medical College Hospital is where we obtained the third copy of all relevant postmortem reports. Cases of strangling using a ligature or by hand were not included in this analysis. In the end, the information was compiled and displayed in a table, graph, and pie chart.

RESULTS

According to the data presented in **Table I**, a significant proportion of the patients fell within the 21–30 age range, with 50% falling within this category. Additionally, the majority of the patients were female, accounting for 66.67% of the total sample.

Table-I: Demographic status of the patients

Variables	Frequency	Percentage
Age group		
6-10 years	4	6.67%
11-20 years	5	8.33%
21-30 years	30	50%
31-40 years	11	18.3%
41-50 years	6	10%
>51 years	4	6.7%
Gender		
Male	20	33.33%
Female	40	66.67%
Material Status		
Married	42	70%
Unmarried	18	30%

According to **Figure 1**, it appears that marital disharmony or quarrels between couples may have been a contributing factor in 35% of hanging cases. There were also instances where individuals faced challenges such as mental health issues, struggles with substance abuse, difficulties in romantic relationships, unexpected pregnancies, incurable illnesses, emotional instability, and various familial issues.

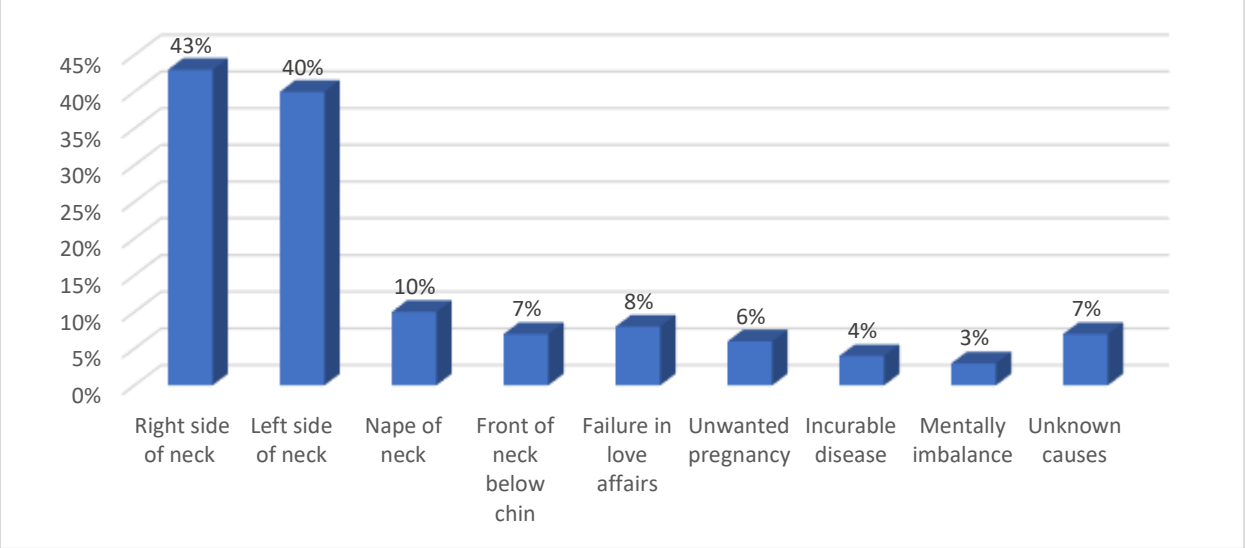

Figure-1: Suspected causes of hanging

According to **Table II**, the most commonly used ligature material for hanging among the patients was dopatta (orna), accounting for 50% of cases. This was followed by jute rope at 18.3% and shari at 10%.

Table-II: Distribution of patients according to ligature materials used for hanging

Ligature materials used for hanging	Frequency	Percentage
Dopatta (orna)	30	50%
Jute rope	11	18.3%
Shari	6	10%
Nylon rope	5	8.33%
Lungi/ dhuti	4	6.67%
Kamiz	2	3.33%
Electric wire	1	1.67%
Other materials	1	1.67%

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According to Figure 2, the majority of the knots in the ligature were located on the right side of the neck (43%), followed by the left side (40%). Additionally, some knots were found at the nape of the neck at 10% and below the chin in front of the neck at 7%.

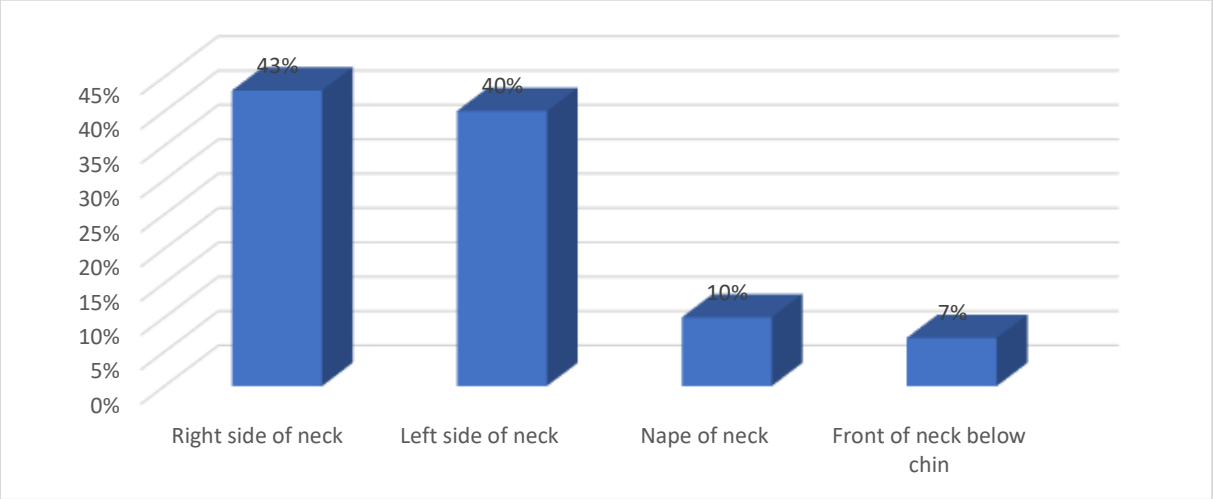

Figure-2: Position of Knot of ligature

According to the findings presented in **Table III**, there appears to be a the relationship among ligature marks on the neck and where they are located and the dominant hand of study subjects, with a majority of them being right-handed. The study reveals that a single ligature mark was observed in the majority of cases (50%), followed by a double ligature mark (33.33%) and a faint mark (10%). In a small percentage of cases (6.67%), the presence of a ligature mark was not observed. The study found that the mark was present in 33.33% of subjects continuously and in 50% of subjects non-continuously. In some cases (50%), the ligature was found above the level of the thyroid cartilage, while in others (33.33%), marks were observed at the level of the thyroid cartilage. A small percentage (6.67%) showed marks below the level of the thyroid cartilage. In the majority of cases (66.67%), the mark

appeared oblique, while in a smaller percentage (16.67%), it appeared transverse. It appears that there is a correlation between the presence of ligature material and the situation at hand in approximately 16.67% of cases.

Table-III: Differences in the marks made by ligatures on the neck.

variables	Frequency	Percentage
As per the loop		
Single	30	50%
Double	20	33.33%
Very Faint	6	10%
Marks absent	4	6.67%
As per the marks obtained		
Continuous	20	33.33%
Non continuous	30	50%
Very Faint	6	10%
Marks absent	4	6.67%
Categorized by level		
Above thyroid cartilage	30	50%
At the level of thyroid cartilage	20	33.33%
Below level of thyroid cartilage	4	6.67%
Missing	6	10%
Categorized by Position		
Direct	40	66.67%
Longitudinal	10	16.67%
Missing	10	16.67%
As per the imprint on the ligature material		
Existing, in keeping with ligature components	10	16.67%
Missing	40	66.67%
Imprint missing	10	16.67%

The information presented in **Table IV** is displayed. Possible damage to the structures in the neck. The study found various injuries to neck structures, including stretching and elongation in the majority of cases, hemorrhage in the underlying layers of neck skin in half of the cases, and hemorrhage in the strap muscles in a significant proportion of cases. Rupture of certain muscles and arteries was also observed in a minority of cases. Additionally, some cases showed petechial hemorrhage in certain areas and congestion of the trachea. A small percentage of cases also had a fracture of the thyroid cartilage or hyoid bones.

Table-IV: Types of Neck Structures Injuries

Types of Injury to neck structures	Frequeny	Percentage
Extending and lengthening the neck	42	70%
Blood loss in the underlying layers of the neck tissues	30	50%
Bleeding in the collar muscles	72	40%
Platysma and sternocleidomastoid muscle rupture	66	36.67%
Transverse rupture of the carotid intima with blood extravasation.	60	33.33%
Vertebral artery rupture with intimal detachment and subintimal hemorrhage.	33	18.33%
Tracheal injury and thyroid cartilage fracture	51	28.33%
Petechial bleed in the epiglottis, larynx, and trachea.	12	6.67%
Obstruction of the trachea	15	8.33%
Breakage of the hyoid bones	24	13.33%

It appears that the victim has suffered from various types of injuries. *

DISCUSSION

It is unknown, how many people in Bangladesh hang themselves every year, but in India, where we have a close ally, there is a suicide every 5 minutes and 7 suicide attempts for a total of roughly 100,000 suicide deaths every year [13].

The majority of suicides in Istanbul are committed by hanging, according to five-year Turkish research (1998-2002) [14]. A research conducted on the subject in Lithuania found that there were a total of 8324 suicides between the years 1993 and 1997, and another 7823 between the years 1993 and 2002.

Hanging was the most prevalent means of suicide among the reported instances [15]. Among the 574 people who were found to have been hanged, only (26.71%) were male, and (72.29%) were female.

Among them, (47.04%) were single, and (52.96%) were married. One hundred seventy-two (29.96%) of the cases of suicide by hanging were linked to marital discord or a conflict between partners.

There were primarily women (66.67%) and young adults (21-30 years old) in this study. Research shows that persons of this age are disproportionately represented among the victims of hanging in other nations as well [16-19].

When looking across all age groups, marital strife was the main cause of suicide or argument (35% of all suicides by hanging). Mental despair, drug addiction, romantic disappointment, unwanted pregnancies, incurable diseases, mental instability, and a host of other issues in the family were all factors.

Young individuals are more likely to commit suicide in both developed and developing countries. Motivating elements include social pressure and mental health difficulties [20]. At night, when no one was there to stop them, many victims killed themselves within the chamber. A majority of people 74.1% according to Davidson et al study said they would rather commit suicide by hanging at home. According to Bowen's research, the vast majority of suicides by hanging occurred in private

settings. Dopatta (orna) was used to make 237 of the ligatures, with jute rope (33.97%) making up the next largest number (195) and shari making up the final 7.32 percent. According to a study conducted between 1997 and 2004 at the Chandigarh Govt Medical College & Hospital in India, chunni (orna) was the most common material used to make ligatures, accounting for 30.90%, followed by nylon rope (18.18%) and bed sheets (16.36%) [21-23].

According to research conducted by Pradhan A between January 2007 and April 2008 in the country of Nepal, the most popular form of head covering was rope, followed by shawls (31.81%), sharis (9.09%), and woolen mufflers (4.54%) [24].

The victims stand on a chair, table, or other object and then push themselves off of the ceiling, fan, hook, pipe, beam, girder, etc.

A tree limb, lamppost, or other outside fixture is often employed as the suspension point in such circumstances. It is not common practice in our nation to employ ligature materials such as a belt, electric wire, scarf, tie, dressing gown cord, shoe lace, curtain cord, telephone cord, shower lead, etc [25].

When looking at where the knot was placed, 43% were on the right side, 40% on the left, 10% on the back of the neck, below the chin, and 7% in the front. Since right-handers outnumber left-handers in the United States, most people tie their neckties on the right.

This is consistent with earlier research conducted by O P Saini in 2005 at S P Medical College in Bikener, India, which found that out of (100%) cases of hanging, (45.45%) involved a knot on the right side of the neck, (33.34%) involved a knot on the left side of the neck, and (21.21%) involved a knot somewhere else on the neck [26]. The knot is typically a slip knot used to make a running noose, although it might also be a granny knot, a reef knot, or even just a loop.

The most obvious visible evidence of hanging is a mark on the neck from the ligature used to suspend the victim. (50%) of the instances had a single ligature mark, (33.33%) had a double ligature mark, and (10%) had a very weak ligature mark.

In 20 cases (6.67%), the ligature mark was totally missing. One hundred (33.33%) of the participants' grades were continuous, whereas the grades of the other (50%) were not.

In (50%) instances ligature was observed above thyroid cartilage level, (33.33%) had marks at thyroid cartilage level and (6.67%) had markings below thyroid cartilage level. There were 200 instances (66.67%) where the mark was skewed, and 50 instances (16.67%) where it was perpendicular.

A ligature-like impression was discovered in (16.67%) of the cases. Once more, delicate traces are left when a soft, wide ligature is used, such as a scarf or a towel. It is possible that a ligature mark will not be there if someone is rescued shortly after being hung. A transverse split of the carotid artery intima with extravasation of blood was found in (36.67%) of cases, as was stretching and elongation of the neck (70%) of the time, hemorrhage in the subcutaneous tissue of the neck (50%) of the time, hemorrhage in the strap muscles (40%) of the time, rupture of the platysma and sternocleidomastoid muscles (36.67%) of the time Ligature material and muscle ruptures create direct damage, which can lead to bleeding, and are indicative of substantial violence, especially in long drops.

Our findings are consistent with those of Reddy, who found that hemorrhage might be present in 25% of cases and muscle rupture could occur in 5- 10% of cases. Rupture of vertebral arteries with intimal tear and sub intimal hemorrhage was detected in 15(2.62%) instances, whereas transverse split of carotid artery intima with extravasation of blood was found in 27(4.70%) cases.

Long drops and extended hanging also causes these problems by putting stress on the heart and causing blood vessels to strain or burst.

Thyroid cartilage fractures occurred in 2 instances (0.35%), petechial hemorrhage in the epiglottis, larynx, and trachea occurred in 16 cases (2.78%), tracheal congestion occurred in 568 cases (98.95%), and hyoid bone fractures occurred in 81 cases (14.11%).

Nikolic S. (2003) shown fracture in 68% of instances; Apurva Nandy (2000) demonstrated fracture in 5-10% of cases; Betz P. (1996) demonstrated fracture in 67% of cases; Wintraub (1961) discovered fracture in 27% of cases; and Reutor (1901) demonstrated fracture in 60% of cases.

However, according to Modi(1988), hyoid bone fractures are extremely uncommon. In contrast, neither Smith and Foddes (1955) nor Mukherjee JB (1994) reported discovering any cracks in their research [27].

CONCLUSION

According to our findings, occurrences of suicide by hanging were more common among younger women. Not only is that, but the leading reason for couples to resort to hanging domestic strife. The vast majority were oriented to the right of the neck and were right-handed. Additionally, most patients have only a single ligature mark. However, we need a multi-center prospective research to determine our true position.

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