Print ISSN: 2958-3675 | Online ISSN: 2958-3683
International Journal of Medical and Pharmaceutical Research
Available Online at https://ijmpr.in/
ORCiDID: 0000-0002-3849-6959
Volume 4, Issue 1; (2023); Page No. 146-150
Original Article
Open Access

The Pattern of Neck Injuries in Hanging Cases Brought to Mortuary of a Tertiary Medical College in Bangladesh: A Retrospective Study

Malay Kumar Das[1*] , Md. Jasim Uddin[2] , Md. Alamgir Parvez[3], Rifatnaoreen Islam[4] , Md. Towhidul Kabir[5], Afroza akter[6], Sandwip Talukder[7], Muhammad Ashad Mian[8]

[1]Assistant Professor (MBBS, DFM), Dept. Of Forensic Medicine & Toxicology, Army Medical College, Bogura, Bangladesh

[2]Associate Professor (MBBS, DFM), Dept. Of Forensic Medicine & Toxicology, Ashiyan Medical College, Dhaka, Bangladesh

[3]Lecturer (MBBS), Dept. Of Forensic Medicine &Toxicology, Army Medical College, Bogura, Bangladesh

[4] Associate professor (MBBS, DFM, MCPS), Dept. Of Forensic Medicine, Medical College ForWomen&Hospital, Uttara, Dhaka, Bangladesh

[5]Lecturer of Forensic (MBBS, DFM), Dept. Of Forensic Medicine & Toxicology, United Medical College &Hospital, Dhaka, Bangladesh

[6]Lecturer (MBBS), Dept. Of Physiology, Ashiyan Medical College, Dhaka, Bangladesh

[7]Assistant Professor, Department Of Forensic Medicine, North Bengal Medical College, Sirajganj, Bangladesh

[8]Associate Professor (CC), Community Medicine Department, Sir Salimullah Medical College, Mitford, Dhaka, Bangladesh

ABSTRACT

Asphyxia is a condition of the body that occurs from severely inadequate oxygen supply or excessive carbon dioxide in the body. It is usually a result of a disruption in breathing or insufficient oxygen supply. Nerve cells in the brain can survive only up to four minutes without oxygen. A retrospective study was conducted in the Department of Forensic Medicine and Toxicology, Khulna Medical College, Khulna, Bangladesh from January 2021 to December 2021, with the objective of analyzing the pattern of neck injuries in autopsy cases of hanging. Out of 405 autopsies, 27.7% of cases were of hanging. Most cases were atypical (95.5%) and complete hanging (90.2%) with the ligature mark situated above the thyroid cartilage. 34.8% of cases had dried salivary stains at the angle of the mouth. The incidence of fracture of hyoid bone was 15.49% of cases. Age is doubtlessly one of the most important variables contributing to the fracture of the neck structure in hanging. The fracture of the hyoid bone should preferably be confirmed by radiography and histology before cataloging it as an antemortem fracture. Dribbling of saliva present in case of hanging is a sure sign of antemortem hanging.

Keywords: *Violent asphyxia, Hanging, Autopsy, Hyoid bone, Thyroid cartilage.*

***Corresponding Author**
Dr. Malay Kumar Das
Assistant Professor (MBBS, DFM), Dept. Of Forensic Medicine & Toxicology, Army Medical College, Bogura, Bangladesh

INTRODUCTION

Hanging is the most common and accessible method of choice for committing suicide due to its foolproof success. Hanging produces painless death for the victims and there is no cost involvement other than that of the ligature material. The report suggested that the Suicide mortality rate in Bangladesh was 3.70 per 100,000 population in 2019 which is a 2.78% increase from 2018.[1] The most common method adopted for suicide is hanging followed by poisoning and jumping under the running train in Bangladesh. The most common age group for committing suicide is age under 40 years. In comparison to other Asian countries, more women commit suicide than men in Bangladesh.[2]Deaths by ligation around the neck have been in practice from time immemorial and before the beginning of civilization. Hanging is a form of asphyxia where a ligature material is encircled tight around the neck by the person's own body weight. It may be complete or partial depending on the nature of the suspension of the body. [3] The body's whole weight is unnecessary, and only a comparatively slight force is enough to produce death. [4] The noose compresses the airways, cutting off the oxygen supply to the lungs. It also make pressure on the carotid arteries, which carry blood to the brain. Both mechanisms cause asphyxia, in which the body and brain are deprived of oxygen. However, asphyxia is not the only cause of death by hanging. In some cases, the pressure on the neck causes vagal inhibition, a reflex that causes cardiac arrest and leads to death.[5,6] All the characteristic features may be present infrequently due to the variable

amount of pressure applied to the neck. Hence it requires a thorough assessment of various post-mortem findings under such circumstances. So our study aimed at with an objective to analyze the pattern of neck injuries in autopsy cases of hanging.

Materials and Methods

The present retrospective study was conducted in the Department of Forensic Medicine and Toxicology at Khulna Medical College, Khulna, Bangladesh with the objective to study the post-mortem findings in autopsy cases of hanging. The data for one year from January 2021 to December 2021 was collected from post-mortem reports of the deceased. Out of a total of 405 medico-legal autopsies, 112 were hanging victims (27.7%) during this time period. Additional information was gathered from the inquest report, hospital treatment records, and by reviewing the photographs. The collected data were entered in Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS).

Results

During this study period, 405 cases were brought for post-mortem examination out of which 112 (27.7%) deaths were due to hanging. (Fig-1) Out of 112 cases, typical hanging was found only in 5 cases (4.5%) whereas, in most of the cases, 107 (95.5%) were atypical hanging, with the position of the knot on the left or right side. The knot was on the right side of the neck in 61 cases (57.0%)(Table-1). In the present study, complete hanging was seen in 90.2% of deaths. Partial hanging was taking lives mostly, accounting for 11(9.8%) deaths (Fig-2). In our study, it was observed that in 95 cases, the level of ligature mark was above the thyroid cartilage, below the thyroid cartilage in 7 cases, and overriding the thyroid cartilage in 10 cases (Fig-3). Dribbling of saliva, the surest sign of antemortem hanging was found in 39 cases (34.8%) of hanging (Table 2). Out of 112 cases in 17 cases we found a fracture of the hyoid bone. Among 17 cases out of the 5 were above the age group of 40 years. The incidence of fracture of the hyoid bone is significantly more in the age group above 40 years when compared to that below 40 years (Table 3).

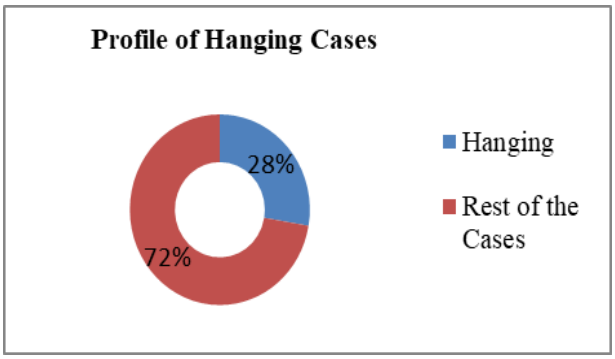

Figure:1. Profile of Hanging Cases.

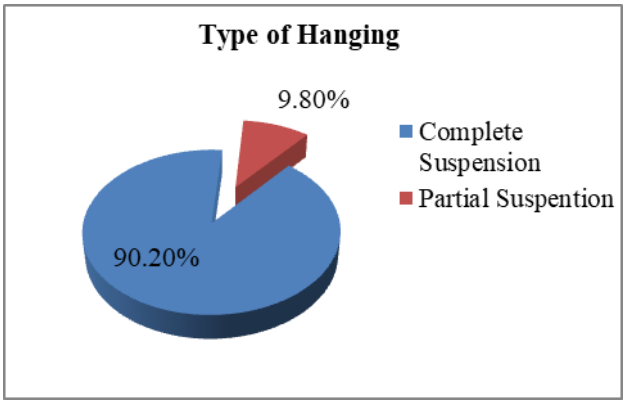

Figure:2. Type of Hanging (Complete/Partial)

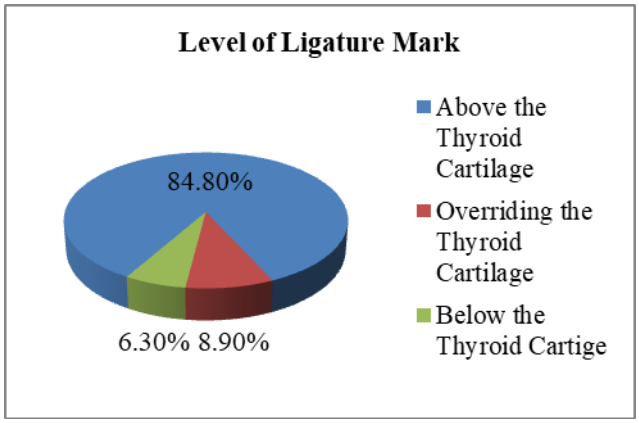

Figure:3.Level of Ligature Mark present in Deceased.

Table-1: Typical and Atypical hanging (N=112)

Typical/ Atypical	**Position of knot**			
	Back	Left	Right	Total
Typical	5(4.5%)	-	-	5(4.5%)
Atypical	-	46(43.0%)	61(54.5%)	107(95.5%)
	5(4.5%)	46(43.0%)	61(54.5%)	112

Table-2: Salivary Stains (N=112)

Salivary Stain	N	%
Present	39	34.8
a) Left (n=39)	20	51.3
b) Right (n=39)	19	48.7
Absent	73	65.2
Total	112	

Table-3: Hyoid Bone Fracture (N=112)

Age in Years	**Sex**		**Hyoid Bone Fracture**					
	M	**F**	**Present (n=17) %**		**Absent (n=95) %**		**Total (n=112) %**	
11-20	7	14	1	5.9	20	21.05	21	18.7
21-30	33	19	1	5.9	51	53.7	52	46.4
31-40	16	6	3	17.6	19	20.0	22	19.6
41-50	6	4	6	35.3	4	4.2	10	8.9
51-60	2	3	4	23.5	1	1.05	5	4.5
>60	2	-	2	11.8	-	-	2	1.8
Inference	The incidence of fracture of hyoid bone in hanging is significantly more (61 times) in age group above 40 years in comparison to the age group below 40 years (X2=111.17, p<0.001).							

DISCUSSION

The most commonly affected age group is between 21 to 30 years. It correlates with other authors' studies. [7,8,9,10,11] Suicide by hanging showed male predominance [7]. The productive younger age group is commonly vulnerable and the prevalence of suicide is more in married people. [7,12]. Asphyxial deaths constitute an important proportion of medicolegal deaths and will continue to do so due to stressful and competitive lifestyles. Out of 112 cases, typical hanging was found only in 5 cases (4.5%) whereas, in most of the cases, 107 (95.5%) were atypical hanging, with the position of the knot on the left or right side. The knot was on the right side of the neck in 61 cases (57.0%). Similar findings were observed in the studies conducted by other authors [3,4]. In the present study, complete hanging was seen in 90.2% of deaths. Partial hanging was taking lives mostly, accounting for 11(9.8%) deaths. This is in accordance with studies by a few authors [5,6] but not in agreement with others [3,4]. In our study, it was observed that in 95 cases, the level of ligature mark was above the thyroid cartilage, below the thyroid cartilage in 7 cases, and overriding the thyroid cartilage in 10 cases. This was also observed in various other authors' studies [3,13]. Dribbling of saliva, the surest sign of antemortem hanging was found in 39 cases (34.8%) of hanging. The findings are consistent with those of Ashok Kumar Samanta et al [14] who observed 32.31% of cases with dribbling of saliva. In 112 cases of hanging, the hyoid bone was fractured in 17 cases (15.2 %). This is in agreement with a study by various authors from Gujrat [14,15]. 17 cases out of the 5 were above the age group of 40 years. The incidence of fracture of the hyoid bone is significantly more in the age group above 40 years when compared to that below 40 years. It has been demonstrated in numerous studies that the incidence of fractures increases with age [4,16] because neck structures become calcified and more brittle in middle and later life[17,18].In our study, not a single case showed damage or fracture to any of the above-mentioned structures. This aspect is well documented in many studies conducted in the recent past and their references are quoted herewith. [10,14,15,16] Another probable reason for diminishing evidence of damage to internal structures of the neck could be attributable to excessive or increased usage of soft and occasionally stretchable material and more casualties resulting from partial hangings.

LIMITATION OF THIS STUDY

Confidentiality of autopsy reports, the underprivileged record management system, and our limited resources and financial support did not allow us to explore other contributory factors that lead them to commit suicide by hanging.

CONCLUSION

Hanging is always considered suicidal in nature until contrary is proved. Asphyxia due to hanging is commonly preferred mode of suicide as non-expensive, death is certain. Age is doubtlessly one of the most important variable contribute to the fracture of the neck structure in hanging. Other post mortem findings like involuntary discharge of urine, fecal matter, semen on glans penis, post-mortem staining etc. will help in the diagnosis when ligature marks are not clear.

Conflicts of Interest: None.
Funding: None.

REFERENCES:

1. Bangladesh Suicide Rate 2000-2023. Available at https://www.macrotrends.net/countries/BGD/bangladesh/suicide-rate.Last accessed on 2nd February 2023.
2. Begum A, Khan NT, Shafiuzzaman AKM, Shahid F, Anam AA, Ahmed KS & et al(2017). Suicidal death due to hanging. Delta Medical College Journal.;5(2): 89–93.
3. Reddy K S(2017) N: The essential of forensic medicine and toxicology,,34thedition,Jaypee Brothers Medical Publishers Pvt. Limited.;315-324.
4. Modi JP(2011). Text book of Medical Jurisprudence and Toxicology, 24th edition, Lexis NexisButterworthsWadhwaNagpur,India. 445-461.
5. Chaurasia N, Pandey SK and Mishra A(2012). An Epidemiological Study of Violent Asphyxial Death in Varanasi Region (India) a Killing Tool. J Forensic Res;3(10):174.
6. Gurudatt KS, Kumar SA, Gouda HS(2011). Analysis of fatal cases of mechanical asphyxia at Belgaum, Karnataka;28(2):51-53.
7. Chavan K.D et al(1999). Study Of Suicidal deaths In Rural Region of Beed District of Maharashtra, International Journal of Medical Toxicology and Legal Medicine, Vol. 1, No.2, Jan-June, P. 29- 31.
8. National Crime Records Bureau(2012). Accidental deaths and suicides in India. New Delhi: Government of India
9. Publication: The Times Of India Mumbai, Date: Feb 22, 2008; Section: Times City ; Page: 5
10. Patel A.P., Bansal A. et al(2012). Study of Hanging Cases in Ahmedabad Region, JIAFM, vol.34 no.4 Oct-Dec, page no.343-345
11. Th.Meera et al(2011). Pattern of Neck Findings in Suicidal Hanging-A Study in Manipur. Oct- Dec, Vol. 33, No. 4, page 350-352

12. N. Vijayakumari(2011). Suicidal Hanging: A Prospective Study, JIAFM October- December, Vol. 33, No. 4, page 353-355
13. T. Saisudheer, T. V. Nagaraja(2012). A study of ligature mark in cases of hanging deaths. Int. J Pharm Biomed Sci; 3(3):80-84.
14. Ashok Kumar Samanta, SoumyaRajanNayak(2012). Newer trends in hanging death.Journal of Indian Academy of Forensic Medicine; 34(1):37–39.
15. M.M.M Shaikh, H. J. Chotaliya, A.D. Modi, A. P. Parmar, S. D. Kalele(2013). A study of gross postmortem findings in cases of Hanging and Ligature Strangulation. Journal of Indian Academy of Forensic Medicine. Jan-March; 35(1):63-65.
16. Sarangi M. P(1998). "Ligature marks" – In Forensic pathologist's perspective. Journal of Forensic Medicine and Toxicology. 15(1):99–102.
17. S. Nikolic, J. Micic, T. Atanasijevic, V. Djokic, D. Djonic(2003). Analysis of neck injuries in hanging.Am. J. Forensic Med. Pathol; 24(1):179–182.
18. B. Knight, P. Saukko(2004). Fatal Pressure on the Neck in: Knight's Forensic Pathology, 3th ed., Arnold Publishers, London, England:368–394.