Indian Journal of Forensic and Community Medicine 2020;7(4):166–169

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Forensic and Community Medicine

Journal homepage: https://www.ipinnovative.com/journals/IJFCM

Original Research Article

Epidemiological study of hanging deaths in Imphal

Khangembam Pradipkumar[1], Supriya Keisham[1,*], Chettri Deepen[1], Sungoh James DW[1], Zohlupuii Lynda B[1]

[1] *Dept. of Forensic Medicine and Toxicology, Regional Institute of Medical Sciences, Imphal, Manipur, India*

ARTICLE INFO

Article history:
Received 20-11-2020
Accepted 02-12-2020
Available online 08-01-2021

Keywords:
Hanging
Ligature mark
Suicide

ABSTRACT

Introduction: Hanging deaths is common in the day to day practice of Forensic expert. According to National Crime Bureau Report of 2016, in India, death due to hanging constitutes 46.2% of suicide.
Materials and Methods: A retrospective study of 205 cases of autopsies done for hanging cases in the mortuary of Regional Institute of Medical Sciences (RIMS), a Tertiary Care Hospital in Imphal, Manipur were studied from the period between January 2008 to December 2019.
Results: This present study throws some light on the emerging trends that hanging is increasingly being adopted by a relatively younger age group between 21-30 years and males constituted 60% while females constituted 40%. Most of the victims were married 60.49% and were settled in urban areas. The place of occurrence was mostly indoors both for males (40.49%) as well as for females (32.68%). Soft ligature was the most commonly ligature material used by hanging victims.
Discussion: Findings of this study will help in highlighting the present scenario of hanging deaths and thus will help in solving many crimes by the law enforcing agencies.

1. Introduction

Deaths by ligation around the neck are in practice from the time immemorial and before adventure of civilization. The application of ligature for taking away the life of another person was one of the common practices in uncivilized societies which were carried out into civilized societies. Hanging is a form of death produced by suspending the body with a ligature around the neck, the constricting force being the weight of the body or a part of the body weight. It may be complete or partial depending on the nature of suspension of the body.[1] The whole weight of the body is not necessary, and only a comparatively slight force is enough to produce death.[2] Death due to pressure over the neck is common in the day to day practice of a Forensic Pathologist. Hanging is one of the commonest methods of choice for suicide due to its guaranteed success rate, painless procedure, easy availability of material used. Hanging produces painless death for the victims and there is no costs involvement other than that of the ligature material.[3] Internationally, death by hanging ranks the most common method of suicide accounting for more than 50% of all suicides in Saudi Arabia and Hungary.[4] In Hinduism, committing suicide is often considered equally sinful as murdering another and souls of individuals committing suicide are denied entry to the afterlife remaining wandering in this world. According to National Crime Bureau Report 2016 in India, hanging constitutes 46.2% of all suicides.A retrospective study of 205 cases of autopsies done for hanging in the mortuary of Regional Institute of Medical Sciences (RIMS) Imphal, Manipur between January 2008 to December 2019 i.e for a period of 12 years, has been carried out. This study throws some light on the emerging trends of hanging with regard to demographic profile, nature of ligature, injuries sustained on the body, etc.

* *Corresponding author*.
E-mail address: supriya_kei@yahoo.co.in (S. Keisham).

https://doi.org/10.18231/j.ijfcm.2020.036

2. Materials and Methods

The present study is a retrospective study conducted in the Department of Forensic Medicine and Toxicology of a tertiary care centre in Imphal, Manipur, between January 2008 to December 2019 i.e for a period of 12 years, after obtaining approval from the Institute Research Ethics Board (REB). All the cases of death due to hanging brought for medicolegal autopsy were included for this study. While advanced decomposed bodies where tissues of neck had already been destroyed were excluded. The autopsy reports of these cases were studied regarding parameters like age and sex, marital status, place of occurrence, ligature material used, number of turns, pattern of injuries, etc. Both external and internal postmortem findings were studied from the postmortem reports. The result so obtained was then subjected to statistical analysis.

3. Result

The total numbers of 205 hanging deaths which were brought to mortuary of Regional Institute of Medical Sciences (RIMS) Imphal, Manipur between January 2008 to December 2019 were analysed.In the present study it has been found that among 205 number of total cases of hanging, 123(60%) cases belong to male and 82 (40%) cases belong to female where male and female ratio was 1.5:1. The highest number of victim were observed in the age group of 21-30 years (31.32%) followed by 31 – 40 years (22.92%) as shown in Table 1. The least number of cases were observed in the age group below 10years. The oldest one was a 71 years old depressed male who had committed suicide and the youngest one was a 7 years old boy who had died of accidental hanging while playing by a rope suspended from a bar at home. Out of the 205 cases, hangings are more common in married individuals which comprised of 124 (60.49%) cases as compared to unmarried with 81 (39.51%) cases.

Most of the hangings 73.18% occurred indoors viz, bedroom, bathroom, kitchen, etc. and the remaining 26.82% occurred outdoors as shown in Table 2. Amongst the indoor hanging deaths, males were 83 (40.49%) cases and females comprised of 67 (32.68%) cases.

In this study, it was observed that most of the victims preferred a soft ligature material like chunni, khudei (loin cloth), bedsheet, sari, shirt, etc. in 126 (61.46%) cases while hard ligature material like ropes, electric cable, leather belt, etc. were used in 79 (38.54%) cases. Regarding position of ligature mark, in majority of the cases both in male and female the position of ligature mark was above thyroid in 167 (81.46%) cases followed by, over the thyroid in 37(18.05%) cases. The position of ligature mark was below thyroid in only one female case as depicted in Table 3. Single turn ligature mark was seen in maximum number of cases i.e, 189 (92.19%). Out of which, 111 (54.15%) were male and 78 (38.04%) were female. Double turn ligature marks were seen more in male i.e, 4.40% than in female (0.97%). Hanging deaths with three or more turns ligature marks were observed more in male i.e, 1.47% than in female (0.97%) as shown in Table 4.

As shown in Table 5, out of 205 hanging deaths, only 77 (37.56%) cases had neck injuries and in 128 (62.44%) cases no injuries were present. Amongst the neck injuries, neck muscle injuries were the commonest form of injury seen in 45 (21.95%) cases followed by carotid artery injuries in 20 (9.75%) cases. Injury of both sides of carotid artery was found in only 2 cases. Thyroid and hyoid fractures occurred in 6 cases each and hyoid bone fracture was more common on right side than left side. In this study, there was no case of fracture of cricoid ring, tracheal ring or cervical vertebrae.

Table 1: Showing incidence of hanging case according to age

Age in years	No. of cases	%
0-10	4	1.96
11-20	38	18.53
21-30	64	31.32
31-40	47	22.92
41-50	36	17.57
51-60	9	4.39
Above 60	7	3.41
Total	205	100

Table 2: Showing incidence of hanging according place of occurrence

Place of occurrence	Indoor	Outdoor
Male 123 (%)	83 (40.49%)	40 (19.51%)
Female 82 (%)	67 (32.68%)	15 (7.31%)
Total = 205	150 (73.18%)	55 (26.82%)

4. Discussion

In the present study male preponderance was found more as compared to female in the ratio 1.5:1, which is in agreement with the findings of several workers which could be due to unemployment, addiction to drinks and drugs, love issues and also male members in Indian society are more expected to bear all responsibilities like dual pressure of career and family responsibilities.[5–7] In general, men tend to choose more violent means (eg, hanging or shooting) and women less violent methods (eg, self-poisoning).[8] Surprisingly, female preponderance in hanging was noted in a study conducted in Bangladesh.[9] Maximum number of hanging cases 31.32% were in the age group of 21-30 years. This finding is comparable with that of other studies.[5,10,11] This could be explained by the fact that this age group is the most active phase of life and exposed to stress and strain of life.

In this study, 60.49% of the cases were married which is consistent with study of Rao D,[12] which could be due to

Table 3: Showing incidence of hanging according to level of ligature mark

Position of ligature mark	Male	Female	Total
Above thyroid	100 (48.78%)	67 (32.68%)	167 (81.46%)
At thyroid	23 (11.23%)	14 (6.83%)	37 (18.05%)
Below thyroid	0	1 (0.49%)	1 (0.49%)

Table 4: Showing incidence of hanging with number of turns of ligature

Number of turns of ligature mark	Male	Female	Total
1	111 (54.15%)	78 (38.04%)	189 (92.19%)
2	9 (4.40%)	2(0.97%)	11(5.37%)
3 or more	3 (1.47%)	2 (0.97%)	5 (2.44%)

Table 5: Showing incidence of injuries of different neck structure

Distribution of different neck structure injuries	Number of cases	%
Muscles haemorrhage	45	21.95%
Thyroid cartilage fracture	6	2.93%
Hyoid bone fracture	6	2.93%
Cricoid ring fracture	0	0
Tracheal ring fracture	0	0
Cervical vertebrae	0	0
Carotid artery injury	20	9.75%
No injuries	128	62.44%
Total	205	100%

marital disharmony, family problems, poverty etc. Most of the hanging cases occurred indoors (73.18%) in both male and female. This is in agreement with several authors due to the fact that familiar environment devoid of any interference preferred by the victims as most of the hanging cases were suicidal in nature.[13,14]

In this study, it was observed that most of the victims preferred a soft ligature material like chunni, khudei (loin cloth), bedsheet, sari, shirt, etc. in 61.46% cases with similar to finding of Saiyed MZA & Modi KA.[15] It may be because of easy availability of different ligature materials at home. Availability of specific means for suicide affects national patterns in the methods used. In the USA, firearms are used in most suicides, with risk of their use being highest where guns are kept in households.[16]

In majority of the 167 (81.46%) cases both in male and female the position of ligature mark was situated above thyroid cartilage and hyoid bone which is similar with the findings of Dekal RV & Shruthi P.[17] In our present study, single turn ligature mark was seen in maximum number of cases i.e, 189 (92.19%) which is consistent with finding of Arif M et al.[18] It may be due to the fact that most victims used limited length of household available ligature material. Hanging deaths with three or more turns marks was observed more in male i.e, 1.47% than in female (0.97%). In this study, extravasation of neck muscles was the commonest internal injury seen (21.95%) similar with finding of Meera TH and Singh MBK, due to compression force, knot position, body angle, struggle prior to death.[13] Carotid artery injuries occurred in 20 (9.75%) cases and there was no case of fracture of cricoid ring, tracheal ring or cervical vertebrae. Several previous studies found significant association between the completeness of body suspension and the occurrence of carotid artery injuries. In case of complete hanging with feet off the ground, the weight of the whole body presses on the ligature due to gravitational drag force of the body opposite to traction force, produces full compressive pressure and traction force by the ligature causes stretching and crushing of the blood vessels. So, probability of getting carotid artery injury is more in case of complete suspension of the body.

In the present study, hanging among young adults is commonly encountered in this part of the country, which represent the most active and productive section of the community and is usually committed by married victim with a male preponderance. It is usually committed in a familiar surrounding especially indoors by using easily available household ligature materials. Suicide is a major health problem and the medical profession has to take a role in the management of this health problem. And the findings of this study will help in highlighting the present scenario of hanging deaths and thus will help in solving many crimes by the law enforcing agencies.

5. Source of Funding

None.

6. Conflict of Interest

The authors declare no conflict of interest.

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Author biography

Khangembam Pradipkumar, Assistant Professor

Supriya Keisham, Assistant Professor

Chettri Deepen, Postgraduate Trainee

Sungoh James DW, Postgraduate Trainee

Zohlupuii Lynda B, Postgraduate Trainee

Cite this article: Pradipkumar K, Keisham S, Deepen C, James DW S, Lynda B Z. Epidemiological study of hanging deaths in Imphal. *Indian J Forensic Community Med* 2020;7(4):166-169.