

Profile and pattern of deaths due to hanging in Chennai - An autopsy-based study

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Abstract

Background: Hanging is that form of violent asphyxial death which is caused (i) either by the exclusion of air from lungs or oxygenated blood from the brain, (ii) by means of ligature around the neck, (iii) the constricting force is the weight of the body. It is the second most commonly used suicide methods in India and has a high mortality⁹. The materials required are easily available, and a wide range of ligatures can be used. Hanging is the most common form of asphyxial death that forensic medicine experts come across in their practice. Death due to hanging is almost instantaneous. It may be suicidal, homicidal or accidental in nature. Suicide by hanging is the commonest, accidental hanging is less common and homicidal hanging is still less common. **Material and Methods:** The present study was conducted in the Department of Forensic Medicine and Toxicology attached to Government Kilpauk Medical College and Hospital, Chennai – 10, Tamil Nadu in the year 2020 from January 2020 to December 2020. In the year 2020, (2719). **Results and Conclusion:** Cases were autopsied among which 713 cases were deaths related to hanging which constitutes to 26.22 % of the total deaths. Maximum number of cases of deaths due to hanging was seen in males which constitutes 70.40% of the total deaths. Maximum deaths due to hanging were seen in the age group of 21-30 Years (29.31%). Most of the deaths due to hanging were seen in married persons (43.33%). Maximum deaths were seen in unemployed persons (27.20%). Maximum cases of death due to hanging were seen in Hindu religion (65.35%). Maximum cases of death due to hanging occurred in home (50.91%). The precipitating factor for hanging is Financial Stress (25.94%). In Maximum cases narrow and thin ligature material was used (61.57%). In maximum cases of hanging the ligature material had a single loop (65.35%). In maximum cases the ligature knot around the neck was a Fixed Knot (68.86%). In maximum cases it was found to be complete hanging (69.28%). In most of the cases hyoid fracture was not seen (80.22%). The most common Post – Mortem Examination finding in hanging related deaths are petechial haemorrhages in the sub pleural surface of the lungs (78.54%). The commonest cause of death in hanging is asphyxia (67.60%) and the most common manner of death is suicidal (94.10%).

Key Words: Hanging, ligature, typical, atypical, noose, suicide.

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INTRODUCTION

Suicide is the final outcome of complex interactions of biological, genetic, psychological, sociological and environmental factors¹. According to Anton J. L. van

Hoof, hanging was the most common suicide method in primitive and pre-industrial societies². A 2008 review of 56 countries based on World Health Organization mortality data found that hanging was the most common method in most of the countries.³ Eighty-four percent of global suicides occur in low and middle-income countries (LMICs); India and China alone account for 49% of global suicides⁴. There is substantial variability both in the prevalence of suicide and in the factors that influence the occurrence of suicide between geographic regions, cultures, and over time, so country-specific analyses are needed to develop targeted suicide prevention efforts. The World Health Organization (WHO) estimates that of the nearly 900,000 people who die from suicide globally every year, 170,000 are from India⁵. However, India's National Crime Records Bureau (NCRB) – which report official

suicide rates based on police reports – estimated only 135,000 suicides in 2011.^{6,7} The number of suicides in India during the decade (2005–2015) has recorded an increase of 17.3% (1,33,623 in 2015 from 1,13,914 in 2005). Majority of suicides were reported in Maharashtra (16,970) followed by 15,777 suicides in Tamil Nadu and 14,602 suicides in West Bengal, accounting for 12.7%, 11.8% and 10.9% of total suicides respectively. Karnataka (10,786 suicides) and Madhya Pradesh (10,293 suicides) accounted for 8.1% and 7.7% of the total suicides reported in the country respectively. These (5) States together accounted for 51.2% of the total suicides reported in the country⁸. Hanging is invariably suicidal. Accidental and homicidal hangings are rare.⁹ Asphyxia is one type of tissue anoxia where lungs are deprived of oxygenated air, its literal meaning is pulselessness or without throbbing pulse¹¹. Actually asphyxia is best described as an interference with respiration due to any cause- mechanical, environmental or toxic. Violent deaths resulting from asphyxia chiefly include Hanging⁹. Asphyxial death forms one of the modes of death which may be suicidal, homicidal or accidental in nature¹¹. As a rule of thumb, hanging is considered as suicidal unless proved otherwise, apart from autopsy, the place, review of scene of crime, psychological state of deceased, substance abuse, employment etc. may add to the conclusion.

AIMS AND OBJECTIVES

The study was aimed towards analysing socio-demographic pattern, precipitating factors for committing suicide by hanging and to study the autopsy study of hanging cases.

INCLUSION CRITERIA

OBSERVATIONS

All the cases of hanging that were brought for Post – Mortem examination to the mortuary of Government Kilpauk Medical College and Hospital.

EXCLUSION CRITERIA

Decomposed and skeletonised dead bodies were excluded out from the study.

MATERIALS AND METHODS

The present prospective study consists of study of hanging cases that were brought for Post - Mortem Examination to the Mortuary of Government Kilpauk Medical College and Hospital, Chennai – 10, Tamil Nadu. The study period was for (1) Year from 01 January 2020 to 31 December 2020. All cases of alleged history of hanging and cause of death of hanging were studied. A prospective s autopsy-based study was conducted during the year 2020, to know the incidence of asphyxial deaths due to hanging at tertiary care centre in Chennai. During this period a total of 2719 cases of Post Mortem Examination were conducted at the Centre, out of which 713 (26.22%) cases of hanging were recorded. After reviewing case papers, post mortem reports, the cases were studied to know the incidence of asphyxial deaths due to hanging with respect to age group, sex, occupation, month, place of occurrence, marital status, precipitating factors and autopsy findings. After analyzing the inquest report and meticulous Post - Mortem Examination of hanging cases the observations and result of the study is presented here. The data’s were collected from Police Requisition Form, Post- Mortem Report, and Forensic Science Lab Report and it was tabulated by cross observational study.

Table 1: Sex wise distribution of deaths due to hanging

SEX	FREQUENCY	PERCENTAGE %
MALE	502	70.40
FEMALE	211	29.59
TOTAL	713	100

Maximum number of cases of deaths due to hanging was seen in males which constitutes 70.40% of the total deaths.

Table 2: Age wise distribution of deaths due to hanging

AGE IN YEARS	FREQUENCY	PERCENTAGE %
BIRTH – 10 YEARS	03	0.42
11-20 YEARS	102	14.30
21-30 YEARS	209	29.31
31-40 YEARS	117	16.40
41-50 YEARS	88	12.34
51-60 YEARS	72	10.09
61-70 YEARS	61	8.55
71-80 YEARS	42	5.89
>80 YEARS	19	2.66
TOTAL	713	100

Maximum deaths due to hanging were seen in the age group of 21-30 Years (29.31%) followed by 31-40 Years (16.40%) and 11-20 Years (14.30%).

Table 3: distribution of cases according to marital status

MARITAL STATUS	FREQUENCY	PERCENTAGE %
MARRIED	309	43.33
UN MARRIED	262	36.74
WIDOW	142	19.91
TOTAL	713	100

Most of the deaths due to hanging were seen in married persons (43.33%) followed by unmarried persons (36.74%).

Table 4: Distribution of cases according to occupation

OCCUPATION	FREQUENCY	PERCENTAGE %
LABOUR	102	14.30
HOUSE WIFE	106	14.86
STUDENT/ EDUCATION	138	19.35
BUSINESS	173	24.26
UNEMPLOYED	194	27.20
TOTAL	713	100

Maximum deaths were seen in unemployed persons (27.20%) followed by business people (24.26%) and in students and persons pursuing education(19.35%).

Table 5: Distribution of cases according to religion:

RELIGION	FREQUENCY	PERCENTAGE%
HINDU	466	65.35
MUSLIM	115	16.12
CHRISTIAN	132	18.51
TOTAL	713	100

Maximum cases of death due to hanging were seen in Hindu religion (65.35%) followed by Christian religion (18.51%) and Muslim religion (16.12%).

Table 6: Distribution of cases according to place of occurrence

PLACE OF OCCURENCE	FREQUENCY	PERCENTAGE %
HOME	363	50.91
TREE OUTSIDE THE HOUSE	64	8.97
LODGE	102	14.30
BATHROOM	96	13.46
WORKPLACE	88	12.34
TOTAL	713	100

Maximum cases of death due to hanging occurred in home (50.91%) followed by Lodge (14.30%) and in bathroom (13.46%).

Table 7: Precipitating factor / reason for hanging

REASON FOR HANGING	FREQUENCY	PERCENTAGE
FINANCIALSTRESS	185	25.94
ILLNESS	86	12.06
EXAMINATION STRESS	42	5.89
DEPRESSION	53	7.43
PSYCHIATRIC ILLNESS	32	4.48
ALCOHOL	68	9.53
INFEDILITY	77	10.79
FAMILY DISPUTE	103	14.44
NOT KNOWN	67	9.39
TOTAL	713	100

The precipitating factor for hanging is Financial Stress (25.94%) followed by Family Dispute (14.44%) and Illness (12.06%).

Table 8: Type of ligature material used

LIGATURE MATERIAL USED	FREQUENCY	PERCENTAGE %
NARROW AND THIN (WIRE, ROPE, SAREE, DUPATTA, ELECTRIC WIRE, PLASTIC LOCK TAGS)	439	61.57
BROAD AND THICK (TOWEL, BEDSHEET, DHOTI)	274	38.42
TOTAL	713	100

In Maximum cases narrow and thin ligature material was used (61.57%) followed by broad and thick ligature material (38.42%).

Table 9: Distribution / type of ligature loop around the neck

TYPE OF LOOP	FREQUENCY	PERCENTAGE %
SINGLE LOOP	466	65.35
DOUBLE LOOP	172	24.12
MUTIPLE LOOP	75	10.51
TOTAL	713	100

In maximum cases of hanging the ligature material had a single loop (65.35%) followed by double loop (24.12%).

Table 10: Distribution of type of ligature knot around the neck

POSITION OF LIGATURE	FREQUENCY	PERCENTAGE %
FIXED KNOT	491	68.86
RUNNING NOOSE	166	23.28
SLIP KNOT	56	7.85
TOTAL	713	100

In maximum cases the ligature knot around the neck was a Fixed Knot (68.86%) followed by Running Noose (23.28%).

Table 11: Distribution of cases based on type of hanging

TYPE OF HANGING	FREQUENCY	PERCENTAGE %
COMPLETE	494	69.28
PARTIAL	219	30.71
TOTAL	713	100

In maximum cases it was found to be complete hanging (69.28%).

Table 12: Incidence of fracture of hyoid

FRACTURE OF HYOID	FREQUENCY	PERCENTAGE %
PRESENT	141	19.77
ABSENT	572	80.22
TOTAL	713	100

In most of the cases hyoid fracture was not seen (80.22%).

Table 13: Post mortem examination findings

FINDINGS	FREQUENCY	PERCENTAGE %
SUB CONJUNCTIVAL HAEMORRHAGE	66	9.25
PROTRUSION OF TONGUE	194	27.20
BLUISH DISCOLOURATION OF NAILS, LIPS, EAR LOBES	432	60.58
POST – MORTEM LIVIDITY OVER DISTAL PHALYNX	46	6.45
SEMEN EJACULATION	162	22.72
FECAL MATTER PASSED OFF	240	33.66
PETECHIAL HAEMORRHAGES IN THE SUB PLEURAL SURFACE OF THE LUNGS	560	78.54

The most commonest Post – Mortem Examination finding in hanging related deaths are petechial haemorrhages in the sub pleural surface of the lungs(78.54%)followed by bluish discolouration of nails, lips, ear lobes (60.58%).

Table 14: Cause of death in hanging

CAUSE OF DEATH	FREQUENCY	PERCENTAGE %
ASPHYXIA	482	67.60
VENOUS CONGESTION	96	13.46
COMBINATION OF BOTH	44	6.17
FRACTURE / DISLOCATION OF CERVICAL VERTEBRAE	23	3.22
EFFECTS OF HANGING (RESCUEHANGING –METABOLIC ENCEPHALOPATHY)	68	9.53
TOTAL	713	100

The commonest cause of death in hanging is asphyxia (67.60%) followed by venous congestion (13.46%).

Table 15: Manner of death in hanging victims

MANNER OF DEATH	FREQUENCY	PERCENTAGE %
SUICIDAL	671	94.10
ACCIDENTAL	03	0.42
HOMICIDAL	39	5.46
TOTAL	713	100

The most common manner of death is suicidal (94.10%) followed by homicidal (5.46%).

DISCUSSION

Maximum number of cases of deaths due to hanging was seen in males which constitutes 70.40% of the total deaths. This is similar to the study conducted by Manoj K Baishya and Putul Mahanta. Pathok Manoj K, Kumar Awdhesh^{12,14}. More cases of suicide by hanging among male may be due to the fact that they are more exposed to occupational stress as well as social and family burden causes more mental agony. Maximum deaths due to hanging were seen in the age group of 21-30 Years (29.31%) followed by 31-40 Years (16.40%) and 11-20 Years (14.30%). This is similar to the study conducted by Pradeep Kumar Mishra, Jitendra Tomar, Abhishek Varun, Pankaj Verma and .Manoj K Baishya and Putul Mahanta. Pathok Manoj K, Kumar Awdhesh^{14,16}. Increased suicide among youth may be due to social disorganization in this modern society, increased expectation from life with increased competition for jobs. This age group is more vulnerable to frustration and breakdown due to decreased patience, unemployment, poverty, dowry tortures, love affairs and domestic quarrels. Most of the deaths due to hanging were seen in married persons (43.33%) followed by unmarried persons (36.74%). This is almost similar to the study conducted by Sachidananda Mohanty. *et al.*²² The commitments of marriage and the family are the major stress including factors which may not be tolerated by all. Maximum deaths were seen in unemployed persons (27.20%) followed by business people (24.26%) and in students and persons pursuing education (19.35%). This is in contrast to the studies conducted by Sharija S *et al.* and Kachare Rajesh *et al.*¹⁸ where labours and farmers committing suicide by hanging was this could be due to urbanization and survival of the fittest in working areas and depression due to unemployment. Maximum cases of death due to hanging were seen in Hindu religion (65.35%) followed by Christian religion (18.51%) and Muslim religion (16.12%). This is in concurrence with almost all the studies because in India majority of the people were Hindu's. Maximum cases of death due to hanging occurred in home (50.91%) followed by Lodge (14.30%) and in bathroom (13.46%). This is similar to the study conducted by Sharija S, Sreekkumari K, Geetha O¹⁸ and Waghmare PB, Chikhalkar BG, Nanandkar SD. This could be attributed to the place of easy accessibility. The precipitating factor for hanging is Financial Stress (25.94%) followed

by Family Dispute (14.44%) and Illness (12.06%). This is almost similar to the studies conducted by Sharija S, Sreekkumari K, Geetha O and Waghmare PB, Chikhalkar BG, Nanandkar SD¹⁸. This could be attributed to the life style adopted and inability to return the debts. With increasing disparity between the poor and rich due to high ambitions, these victims fall short of their expectations and who then adopts to commit suicide by hanging. In Maximum cases narrow and thin ligature material was used (61.57%) followed by broad and thick ligature material (38.42%). This is similar to the study conducted by Davidson A and Marshall TK²¹ as those materials are easily available or readily available at home or any area. In maximum cases of hanging the ligature material had a single loop (65.35%) followed by double loop (24.12%). This is similar to the study conducted by Davidson A and Marshall TK as there would be no time at that material time when the mind is prefixed with a strong determination to commit suicide by hanging. In maximum cases the ligature knot around the neck was a Fixed Knot (68.86%) followed by Running Noose (23.28%). This is similar to the study conducted by Davidson A and Marshall TK²¹. This could be attributed to time or an urge to commit suicide by hanging. In maximum cases it was found to be complete hanging (69.28%). This is similar to the study conducted by Davidson A and Marshall TK. This could be attributed to accessibility, point of suspension of the scene of crime. In most of the cases hyoid fracture was not seen (80.22%). This is similar to the study conducted by Sheikh *et al.* and was in contrast to the study conducted by Dr. Tirpude B.H, Dr. Murkey P.N²². This could be attributed that hyoid is a cartilage and has got the tendency of recoiling and it becomes a bone after 45 Years. Henceforth fractures of the hyoid bone is more common rather than hyoid cartilage fractures. The most commonest Post – Mortem Examination finding in hanging related deaths are petechial haemorrhages in the sub pleural surface of the lungs (78.54%) followed by bluish discolouration of nails, lips, ear lobes (60.58%). This is almost similar to the study conducted by Mohammed M. Sheikh *et al.*¹⁵. It indicates that not all the cardinal signs of asphyxia should be present in all cases of hanging. It may or may not be seen as the cause of death due to hanging is given by excluding all other causes of death. The commonest cause of death in hanging is asphyxia (67.60%) followed by venous

congestion (13.46%). This is similar to the study conducted by Davidson A and Marshall TK²¹. This could be attributed to the weight, ligature material and the amount of constrictive force applied over the neck. The most common manner of death is suicidal (94.10%) followed by homicidal (5.46%). This is similar to all the studies but in our studies we have reported homicidal cases where the persons were hanged, this could be attributed to the built and intoxication where it could be easy for the accused to hang a person at that material time.

CONCLUSION

The number of suicidal hanging cases is increasing day by day. A well designed and comprehensive programme is needed to identify the causative factors and prevention of suicidal behaviours. Appropriate education, influencing the media in their portrayal of suicidal news, reporting method, involvement of young generations in suicide prevention campaign may reduce the rate of suicidal death by hanging in future. Overall poverty, lack of job, family problems, defamation, social withdrawal and alcoholism are the main reason for hanging. Hanging as a method of suicide is difficult to prevent but cautious screening of susceptible persons, careful watch and monitoring their behaviour and psychological counselling can reduce suicide. More suicide prevention options exist within controlled environments. The broadcasting media has reached the kitchen of every home and the incidences like hanging of Saddam Hussain was seen by many. One of the "Rarest of the rare" punishments has been reported by TOI that couple accused in Bombay blast has been awarded death punishment by court. The high lightening of farmer's suicides in Tamil Nadu is also being seen by all in all electronic media. Though Prime Minister's package for the farmer's suicides have been declared and implemented in certain areas of central India but still people are committing suicide by hanging as the most effective, easy and cheapest way of ending their lives.

RECOMMENDATIONS

Suicide today has become a major health issue throughout the world, despite all legal, moral, social and religious barriers. Males of younger age group were mostly involved in the study. Elderly persons at home should take the responsibility in hard times during life and console youngsters. Other family members should keep a constant watch on the affected member of family and should try to engage them in continuous talks. Psychiatric counselling should be taken for the member. Development of prevention of suicide programmes with their proper implementation is required. Public awareness with the involvement of NGO's and social organizations may play the beneficial role. In future prospective study can be

conducted including psychological autopsy for extended in depth study which can be helpful for the society and aiming towards reducing such untimely and unfortunate incidences. Due to the complexity and peculiarity of controlled environments, we recommend suicide prevention assessments by external experts to effectively design in-house structural suicide prevention. As we observe from the present study that hanging has become a popular and commonest method of committing suicide.

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