Original Article

Suicide by hanging : a study of 334 cases

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Abstract

Global suicide rates have increased 60% in the past 45 years. Its incidence is also high in Bangladesh and the mode of suicide is hanging in majority of cases. This study summarizes the post mortem examinations on 334 cases of suicide by hanging during 2010 to 2012 in the Department of Forensic Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka. The focus was on its epidemiology in Bangladesh and to identify factors that contributed to suicide. Among the 334 cases, 69.2% were male and 56.0% were married. Most (62.3%) were between 20 to 40 years. Most of the victims were from middle socioeconomic group. Regarding motive for committing the suicide by hanging, family disputes were most common motive (38.9%) in male and in female the most common motive was harassment particularly in married women (23.1%). The high incidence of suicidal hanging among young adults imposes a huge socioeconomic burden on our society. Private nature of hanging and easy availability of ligature materials and ligature points makes prevention of suicide by hanging a difficult task. Social, legal and psychiatric interventions are required to prevent suicide.

Key words: Suicide, hanging, ligature mark

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Introduction

Death due to pressure over the neck is common in the day to day practice of the Forensic Pathologist. Three forms of pressure on the neck are of medico-legal importance, namely manual strangulation, ligature strangulation and hanging. Hanging or 'self suspension' is a form of ligature strangulation where the pressure is produced by the weight of the body itself.[1] It is almost invariably suicidal except in some masochistic accidental cases.[2] But homicidal hanging is extremely rare.

Hanging is a form of asphyxia which is caused by suspension of the body by a ligature, which encircles the neck, the constricting force being weight of the body, where whole weight is not necessary. Weight of the head (5kg-6kg) is enough to act as constricting force. So death happens in partial hangings also, which are on toes, feet touching, sitting, kneeling and lying down postures.[1,2] Hanging produces painless death for the victims and there is no costs involvement other than that of the ligature material. A thin rope around the neck will cause unconsciousness in 15 seconds.[1,2,3]

Global suicide rates have increased 60% in the past 45 years. Over one million people die by suicide worldwide each year. The global suicide rate is 16 per 100,000 population. On average, one person dies by suicide every 40 seconds somewhere in the world. 1.8% of worldwide deaths are suicides.[4]

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.[5] In general, men tend to choose more violent means (eg, hanging or shooting) and women less violent methods (eg, self-poisoning).[6] In rural areas of many developing countries, ingestion of pesticides is the main method of suicide, reflecting toxicity, easy availability, and poor storage. As many as 30% of global suicide deaths might involve ingestion of pesticides.[7]

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 data, highest incidence of hanging was found to be 90.6 % in Kuwait (1995–2001) and 83.1% in Lithuania (1998–2004) among the total number of suicide cases.[4,8]

Hanging is the most common method of suicide in Bangladesh. According to police statistics, from 2002 to 2009, 73,389 people committed suicide in Bangladesh. Of these 73,389 people, 31,857 people hanged themselves and 41,532 swallowed poison to commit suicide.[9] Population-based surveillance in a rural community in southwest Bangladesh revealed that suicide is a major cause of mortality, especially in young females. Mortality from suicide occurred at a rate of 39.6 per 100,000 populations per year from 1983-2002.[10]

Passion, disappointments, loss of property, misfortune, financial losses, poverty, disgust with life, physical and mental sufferings, religious mania, unhappy love, failures in many aspects, marital problems, jealous, unbearable fear and pain are some of the common known reasons for hanging. These will vary widely from country to country, between religions and socio-economic classless. Marital problems is the leading cause in developing countries like Bangladesh.[6] A suicide victim will use any article readily available for the purpose i.e. sari, orna, dhoti, rope, towel, bed sheet, chains and wires.

This study was carried out to look in to the suicide cases by hanging with special attention to causes or factors that led the suicide victim to hang themselves.

Methods

This descriptive study was conducted in the Department of Forensic Medicine, Sir Salimullah Medical College & Mitford Hospital. The period of study was from 2010 to 2012. A total number of 334 autopsies were done during this period on dead bodies who died due to hanging.

Various identification data of the victim like age, sex, marital status, permanent address, suspension of dead body along with places of incidence, time and suspected causes of death were noted from the inquest report accompanying the dead bodies. The preliminary investigating report submitted by the police (inquest report) played very important role in this regards. Other related informations were gathered from the victim's attendants. Points regarding knot of ligature material, injury to neck structures, ligature mark, stomach condition were noted during post mortem examinations. All information was noted in a structured data sheet.

Results

The total numbers of autopsies done for hanging cases in the mortuary of Sir Salimullah Medical College between the periods of 2010 to 2012 were 334. About identity of deceased, out of 334 cases of hanging, 323 (96.7%) victims were identified and 11 (3.3%) victims were unidentified. Among them 231 (69.2%) were male and 103(30.8%) were female. (Figure -1) The mean age of male was 28.86±11.27 years with a age range of 8 to 70 years and the mean age of female was 25.31±7.70 years with a age range of 11 to 78 years. Age of the most victims (62.3%) was between 20 to 40 years.

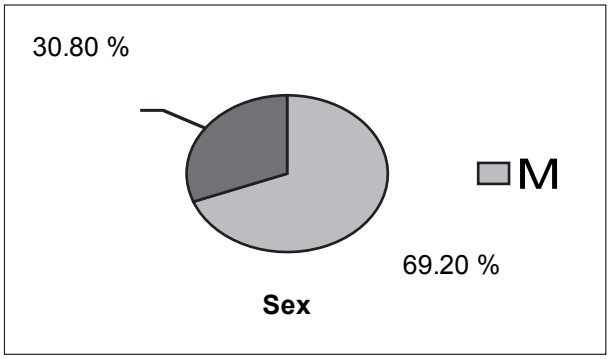

Figure-1: *Distribution of the study patients by sex (n=334)*

Regarding marital status of the victims, 187 (56.0%) were married, 136 (40.7%) were unmarried and in 11 cases (3.3%) the marital status were unknown.

Out of 334 cases of hanging, 261(78.1%) deceased were from middle income group, 55 (16.5%) were from lower income group and 7 (2.1%) were from higher income group. Socio-economic class was not known in 11 (3.3%) cases.

About the educational status, it was observed that more than a half 173(51.8%) of the cases were illiterate followed by 23.1% passed primary education level, 20.1% passed S.S.C education level and 1.8% passed H.S.C education level. (Table-I)

Table I: Distribution of the study patients by educational status (n=334)

Educational status	Number of patients	Percentage
Illiterate	173	51.8
Primary	77	23.1
S.S.C	67	20.1
H.S.C	6	1.8
Unknown	11	3.3

Regarding motive for committing the suicide by hanging, in male, family disputes were most common motive (130, 38.9%) and in female the most common motive was harassment in married women (77, 23.1%). Suicide cases were more common in nuclear family (76.0%), male sex (69.2%), age in the 4th decade and above (24.69%), alcoholism (12.6%), physical illness (9.6%),

economic crisis (8.1%), broken family (6.3%), widowhood (5.7%), mental Illness (3.6%) and criminality (2.1%). (Table-II)

Table II: Risk factors associated with suicide

Risk factors	Number of patients	Percentage
Nuclear family	254	76.0
Male	231	69.2
Family disputes	130	38.9
Age 4 th decade and above	82	24.6
Harassment (married female)	77	23.1
Alcoholism	42	12.6
Physical illness	32	9.6
Economic crisis	27	8.1
Widowhood	19	5.7
Mental Illness	12	3.6
Criminality	7	2.1
Previous attempt	3	0.9

Out of 334 cases hanging, in 287 cases (85.9%), the ligature material was soft, in 27 cases (8.1%) it was firm, in 7 cases (2.1%) it was hard and in 13 cases (3.9%) the nature of ligature material was not known. (Table-III)

Table III: Nature of ligature material

Ligature material	Number	Percentage
Soft	287	85.9
Firm	27	8.1
Hard	7	2.1
Unknown	13	3.9

Regarding level of the mark over the neck, in 294 cases (88.0%) the mark was present above thyroid cartilage, in 33 cases (9.9%) it was present over the thyroid cartilage and in 7 cases (2.1%) it was present below the thyroid cartilage. Grooving of the ligature over the skin of neck was present in 181 cases (54.2%). In 203 cases (60.8%) the knot was on the left side of neck, in 93 cases (27.8%) it was on the right side of neck, in 38 cases (11.4%) it was on the back of neck. Pattern of ligature over the skin was present in 33 cases (9.9%) and absent in 301 cases (90.1%). Evidence of a slip knot was present in 197 cases (59.0%), fixed knot was present in 107 cases (32.0%) and in 30 cases (9.0%) there was no particular type of knot.

Discussion

Among the 334 suicide cases by hanging in this study, majority (69.2%) were male. Worldwide suicide is more prevalent among male. Ahmad M et al, 2010 found a female majority (58.63%) in their study on suicide by hanging in Bangladesh.[11] According to an Indian study by Vijayakumari N et al, age of the most victims (62.3%) was between 20 to 40 years and majority (84.7%) of the victims were below the age of 40years.[12] In a similar study by Ahmad M et al, most of the victims were from the age group 20-30 years (45.51%).[11] The incidence of hanging deaths is minimal in the extremes of age. In the early childhood (below 10 years) the deaths are either homicidal or accidental in nature as emotions have no important role to play. In contrast, in other extreme of age i.e. old age, the low incidence is due to compromise and acclimatization to the factors leading to suicide. Regarding marital status of the victims, most were married. Similar findings were observed in other studies. This goes in favour of another finding of similar studies that marriage related problem is a predominant cause of suicide by hanging.[11, 12]

In this study, hanging deaths is rare (2.1%) in upper income group. This is in accordance with the general trend of criminal profile which originates from the roots of environmental and psychological factors. This is why, the maximum incidence of the hanging deaths are seen in middle income group (78.1%), who never compromise or accept the reality. In contrast, the lower income group shows the same trend, but on a lesser scale, which indicates the incidence of hanging deaths is more of psychological in origin.

Family disputes were most common motive 1(30, 38.9%) and in females, the most common motive was marriage related harassment particularly in married women (77, 23.1%). Several studies in different parts of the world showed that conflicts relating to marriage like dowry harassment are one of the major social evil that had a crucial role in areas of poor socioeconomic condition. Family quarrel among husband and wife was also a important cause in this group.[11,13] Nuclear family, age in the 4th decade and above, alcoholism, physical & psychiatric illness, economic crisis were the other factors that contributed to self hanging. In other studies, organic illness was important precipitating factor (18.5%) next to marital unhappiness. Chronic abdominal pain, cardiac disease, epilepsy and cancer were frequently associated with suicidal hanging.[14,15] Eddlesto M et al, 1998 observed in his study that association of psychiatric illnesses was just 6.2%.[13] Soft material like cloth, saree, orna, dupatta were the preferred material for hanging in

this study (85.9%) followed by firm materials (8.1%) like rope. Hard material likes iron wires, cable wires, etc were used very rarely (2.1%) and the victims who used these were almost always male. According to our study, male choose soft and firm materials for ligation equally. In contrast, female choose soft material only. These findings are consistent with other studies.[11,12,16, 17]

In this study, usual position of the ligature mark was above the thyroid cartilage (88%), whether it is complete or partial hanging, followed by mark over thyroid (9.9%). Only in 2.1% cases, it is seen below the thyroid cartilage. This contradicts the misconception that in partial hangings the ligature mark is seen at a lower level, compared to complete hanging. This is due to the application of slip knot in majority of cases where final tightening of ligature occurs after the noose reaches its final destination, i.e. upper part of the neck. Pattern of ligature over the skin was observed in 9.9% of cases of hanging deaths. Presence of pattern indicates that a firm or hard material is used for ligation, but absence of pattern cannot exclude a firm material.

In 60.8% the knot was in left side of neck, in 27.8% it was in right side of neck and in 11.4% it was on the back of neck. Knot on right side of neck is commonly available for right hand users, who are more abundant in our country than left hander. Findings of Ahmad M et al were also similar.[11]

The high incidence of suicidal hangings among young adults imposes a huge socioeconomic burden on our society. Private nature of hanging and easy availability of ligature materials and ligature points makes prevention of suicide by hanging a difficult task. Social awareness for marital unhappiness, legal action for dowry harassment and proper employment facilities for the youth are required for primary and secondary prevention of suicidal hangings. Active psychiatric intervention is required for those survived from suicidal attempt and also for vulnerable group of people. Further well designed and large scale studies are required to look deeply in to the risk factors and formulate preventive measures.

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