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A Study of Asphyxial Death Cases in Medico-Legal Autopsy

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ABSTRACT

Literally, the term asphyxia means absence of pulsation (pulselessness), though its usage in Forensic Medicine has generally come to mean a lack of oxygen. Actually Asphyxia is best described as an interference with respiration due to any cause – Mechanical, Environmental, or Toxic[1]. During the year 2011 and 2012, 2777 and 2793 autopsies were conducted in the mortuary of the department of Forensic Medicine, Gauhati Medical College and Hospital, Guwahati, out of which asphyxial deaths were 15.8% and 19% respectively. So there is an enough scope of doing such an important study as the number of such cases is high. In this study at the Gauhati Medical College, Guwahati, Assam during the period from 1st July 2012 to 30th June 2013, out of the 2772 cases being autopsied in mortuary, 320 (11.54%) cases were of deaths due to asphyxia. Hanging topped the list with 250(78.12%) cases followed by drowning, 64(20%) cases, strangulation, 3 (0.94%) cases and choking, 3(0.94%) cases. The others epidemiological data, i.e. occupation, motive and circumstances of the death, etc. were discussed to know the pattern of asphyxial death cases as well as way of preventions by adopting certain measures.

Keywords*: Suicide, hanging, drowning*

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INTRODUCTION

As to existing terminology, the word asphyxia enjoys wide usage, especially in the courts - but in everyday speech, the phrase 'an asphyxial death' usually implies one due to mechanical blockage of the air passages. Violent deaths resulting chiefly from asphyxia includes death due to hanging, strangulation, suffocation and drowning. Hanging is usually suicidal, but accidental hanging can occur among children during playing or in toddlers by slipping of restraining straps, or among athletes who are in the habit of exhibiting hanging, or in persons with masochistic or transvestic tendency. Strangulations are almost always homicidal except in children and in workplace accidents in which a tie or other article of clothing is caught on machinery.[1] Sometimes, it is not easy to state whether death is due to suffocation, it is therefore very essential to look for evidences of violence in the shape of external marks surrounding the mouth and nostrils or on the inside of mucosal surface, or on the chest. In northern parts of India, it is not uncommon to throw dead bodies into running streams, to avoid the detection of crime.[2]

MATERIALS AND METHODS

Material for the present study which is an autopsy based descriptive cross-sectional study consists of 320 cases of asphyxial death cases taken from the medico-legal autopsies performed in the department of Forensic Medicine, Gauhati medical College, Guwahati, Assam during the period from 1st July 2012 to 30th June. The various epidemiological data, i.e. age, sex, occupation, motive and circumstances of death, etc. were gathered from the police papers like inquest report, dead body

challan, etc. and thorough detailed interviews of the friends, relatives, neighbors and police officials accompanying the dead bodies taken separately and results were analyzed.

OBSERVATIONS AND RESULTS

Incidence of asphyxial death cases: Regarding the incidence of asphyxial death cases, out of the **2772** cases being autopsied in mortuary, **320 (11.54%)** cases were of deaths due to asphyxia.

Various methods of asphyxial deaths: The incidence of various asphyxial deaths was recorded and, out of 320 asphyxial death cases, hanging was found to be the commonest of all, 250 (78.12%) of which 173 (54.06%) cases of were male, 64 (20%) cases were due to drowning, of which 52 (16.25%) cases were male. Three (0.94%) cases were due to strangulation with female preponderance. All the cases of choking, i.e., 3 (0.94%) were males (**Table 1**).

Table 1 Various Methods of Asphyxial Deaths

Methods of Asphyxia	Male		Female		Total	
	No.	%	No.	%	No.	%
Hanging	173	54.06%	77	24.06%	250	78.12%
Drowning	52	16.25%	12	3.75%	64	20%
Strangulation	1	0.31%	2	0.62%	3	0.94%
Choking	3	0.94%	0	0%	3	0.94%
Total	229	71.56%	91	28.44%	320	100%

Religion wise distribution: In the present study, out of 320 cases, 279 (87.19%) cases belonged to Hindu community, 35 (10.94%) cases were from Muslim community and 6 (1.87%) cases were from Christian community.

Age and sex wise distribution: 106 (33.12%) cases of asphyxial death occurred in the age group 21-30 years of which 82 cases (25.62%) were male and 24 cases (7.5%) were female, followed by 71 (22.19%) cases in the age group 11-20 years, in which 37 (11.56%) cases were male and 34 (10.62%) cases were female. It is also observed from the table that among the 320 cases studied, 229 were male comprising 71.56% and 91 were female comprising 28.44%, the male to female ratio being 2.5:1 (**Table 2**).

Table 2 Age and Sex wise distribution of cases

Age (in years)	Male		Female		Total	
	No.	%	No.	%	No.	%
0-10	05	01.56%	03	0.94%	08	2.50%
11-20	37	11.56%	**34**	10.62%	71	22.19%
21-30	**82**	**25.62%**	24	07.5%	**106**	33.12%
31-40	42	13.12%	11	03.44%	53	16.56%
41-50	26	08.13%	07	02.19%	33	10.31%
51-60	22	06.88%	06	01.88%	28	8.76%
61-70	11	03.44%	04	01.25%	15	4.69%
71-80	03	0.94%	02	0.62%	05	1.56%
81-90	01	0.31%	00	00%	01	0.31%
Total	229	71.56%	91	28.44%	320	100%

Locality: In the present study, maximum number of incidence was found in rural area, 140 (43.75%) cases, followed by urban area, 133 (41.56%) cases.

Educational status: Majority of the victims were under-metric, 70 (21.88%) cases, followed by 64 (20%) cases, up to primary level, 62 (19.38%) cases up to high-school and 56 (17.5%) cases up to higher-secondary level and 27 (8.33%) cases up to Graduate level or above, 41 (12.81%) cases were illiterate.

Occupational status: Highest number of cases, 72 (22.5%) were students, of which 37 (11.56%) were male and 35 (10.93%) cases were female. This was followed by daily-labourers, 58 (18.12%) cases of which 53 (16.56%) cases were male. 55 (17.18%) cases found to be having service and 52 (16.25%) cases were businessman.

Marital status: In the present study asphyxial death cases were more in the married males 131 (40.93%) followed by married females 47 (14.68%).

Place of occurrence of events: The different places of occurrence are shown in **Table 3.**

Table 3 Place of occurrence of events

Category	Number	Percentage
Residence	225	70.31%
Pond	32	10.00%
Outfield	26	8.13%
River	19	5.93%
Tree	06	1.88%
Working Place	04	1.25%
Well	03	0.94%
Drain	05	1.56%
Total	**320**	**100%**

Personal habits of the cases: 105 (32.81%) victims did not have any habit of taking either tobacco or alcohol or any other drugs; 71 (22.19%) victims used to take alcohol only and 49 (15.31%) were addicted to alcohol, tobacco and betel nut (**Table 4)**.

Table 4 Personal habits of the victims

Category	No	%
Alcohol	71	22.19%
Alcohol + Betel nut	17	5.31%
Alcohol + Smoking	6	1.87%
Alcohol + Tobacco + Betel nut	49	15.31%
Betel nut	47	14.69%
Betel nut + Tobacco	22	6.88%
Smoking	3	0.94%
Nil	105	32.81%
Total	**320**	**100%**

Seasonal variation of the cases*:* Maximum number of asphyxial deaths occurred during summer season, 90 (28.12%), followed by autumn 86 (26.88%) and spring 85 (26.56%).

Probable nature of death*:* Suicidal deaths constituted the maximum number, 268, of which hanging constituted the major bulk i.e. 250 (93.28%). Amongst the accidental deaths of 49, drowning cases were 46 (93.88%) and choking cases were 3 (6.12%). All the cases of homicide i.e. 3 (100%) were due to strangulation.

DISCUSSION

The incidence rate of asphyxial death in the present study is found to be 11.54%. The findings of present study are different from the study of *Singh A* et al[3], *Palimer Vikram* et al[4], *Chaurasia N, Pandey SK* et al[5], and *Dhillon Sangeet* et al[6] who observed slightly lower incidence of violent asphyxial deaths in their study. However, *Choudhury BL*[7], *Patel-A*[8] and *Azmak D*[9] observed slightly higher incidence. The findings of present study are similar with the study done by *Lalwani S* et al[10] in which the incidence of violent asphyxial deaths comprised approximately 11.21% of all forensic autopsies. The reason for variation in the incidence of asphyxial death in the different parts of world may be due to cultural, ethnic, geo-graphical and genetic difference.

In the present study, it was observed that hanging was the commonest form (78.12%) of asphyxial death followed by drowning (20%), choking (0.94%) and strangulation (0.94%). The findings of the present study is similar with the several workers like Singh B et al[11], *Momochand A* et al[12], *Azmak D*[9], *Palimer Vikram*[4], *Chaurasia N, Pandey SK* et al[5], *Choudhury BL*[7] and *Patel Ankur* et al[8] in which hanging constitutes the majority of cases.

Males were the most common victims with male to female ratio being 2.5:1. In this study, maximum incidence of asphyxial deaths was seen in age group ranged from 21-30 years and then in 11-20 years of age, contributing 33.12% and 22.19% of the total asphyxial deaths respectively. If we add the two groups, it makes 55.31% of the total asphyxial deaths. It clearly indicates that young adults are the main victims of asphyxial deaths. The findings of the present study are similar with the study of *Copeland AR*[13], *Auer A*[14], *Majumder BC*[15], *Lalwani S et al*[10], *Chaurasia N et al*[5] and Patel-A et al.[8]

In the present study, majority, i.e., 21.88% of the victims was under-metric, followed by 64 (20%) cases, up to primary level. Graduates, post-graduates and illiterate were the least affected group which differs from the study of Pathak NM[16] who found maximum number of cases with education level upto high school standard. Low level of education of the victims found in the study is correlated with the fact that victims either remain unemployed or competition for the job is one of the major anxiety factors among them. Again number of illiterate people committing suicide is also high, poverty and struggles for survival being the main reason among this group of people which increased the number of incidence of suicide among them. Again failure in exams, increased competition for better performance and also failure in love affairs is one of the common cause of suicide among school and college going students.

In the present study, it was observed that students constituted the highest number of cases, 72 (22.5%) followed by the daily labourers 58 (18.12%), service holders and businessman which is similar with the findings of *Majumder BC.*[15]

It was observed that most of the victims were married 178 (55.62%) which is supported by *Vijayakumari N.*[17]

In the present study, 225 (70.31%) cases occurred in their residence, 10% cases in the pond, 8.13% in the outfield, 5.93% in the river, 1.88% in the tree, 1.25% at their working place, 0.94% in the well and 1.56% cases were found in the drain, which is consistent with the study of *Vijayakumari N.*[17]

Hanging, (93.28%), as the method of suicide, was found to be more prevalent among all suicidal deaths the reason being it is painless, materials required are easily available, a wide range of ligatures can be used and has a very high mortality rate. Amongst the accidental deaths of 49,

drowning cases were 46 (93.88%). All the cases of strangulation were homicidal and choking was accidental. The present study is similar with the findings of *Davidson A*, Marshall TK [18], Majumder BC [15], Lalwani S et al [10], Azmak [9], Kanchan T, Rastogi P et al[19], Chaurasia N, Pandey SK et al[5], Patel Ankur et al[8] and Musaib Mohammed Shaikh M et al.[20] The high rate of suicides may be attributed to the increasing number of population resulting in all round deficiencies of food, shelter, educational and health facilities, job opportunities which put the population of the present society at risk of all sorts.

CONCLUSION

In the present study, suicidal deaths as a result of hanging and accidental deaths as a result of drowning seems to be the major contributing causes of asphyxial deaths. Both these manner of deaths, somehow, indicates frustration and carelessness on the part of population which are preventable and needs to be rectified on urgent basis. A well designed and comprehensive programme is needed to identify the causative factors and prevention of suicidal behaviours. Measures to improve the socio-economic conditions through reforms in the fields of education, health, increase in employment opportunities are expected to lessen the existing stress and strain of the society. This in turn will help to decrease the incidence of suicidal, homicidal or accidental cases of asphyxia. Drowning prevention strategies should be comprehensive and include: engineering methods which help to remove the hazard, legislation to enforce prevention and assure decreased exposure, education for individuals and communities to build awareness of risk and to aid in response if a drowning occurs, and prioritization of research and public health initiatives to further define the burden of drowning worldwide and explore prevention interventions.

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