

Deaths from Asphyxia : A Study at Dhaka Medical College

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ABSTRACT

Background: Asphyxial deaths have become the common mode of death in our community in recent years due to drastic increase in the numbers and rates of crimes, violence, poverty, stress, revenge mindset, unemployment and population explosion. Violent deaths resulting chiefly from asphyxia includes death due to drowning, hanging, strangulation and suffocation. The objective of this study was to find out the incidence of asphyxial deaths in Dhaka city in relation to frequency, patterns, sex, socio-demographic factors, probable cause and manner of death of the studied population in order to address the issue with an aim to reduce such deaths in near future.

Materials and methods: This retrospective study was conducted in the Department of Forensic Medicine & Toxicology, Dhaka Medical College over one year during January 2019 to December 2019. A total of 61 postmortem cases were examined and the data was collected from findings of the postmortem reports, inquest reports and challan.

Results: Our findings revealed that out of 61 cases, majority of deaths were due to hanging 39 (63.93%) followed by drowning 10 (16.39%), strangulation 08 (13.11%) & suffocation 04 (6.56%). Sex distribution reveals that most victims of hanging (51.28%) & suffocation (75%) were females. While males were predominant in death due to drowning (90%) & strangulation (75%). Socioeconomic classification of the victims was done on the basis of monthly income. 68.65 % of these victims belonged to low socio-economic status. 19.67% belonged to middle class family and only 11.48 % of the victims were from upper class families.

Conclusion: In our study, we found that most of the asphyxia deaths were due to hanging.

KEY WORDS

Asphyxia; Drowning; Hanging; Strangulation; Suffocation.

INTRODUCTION

The term asphyxia is a Greek word meaning 'pulselessness' or 'absence of pulse'.¹ It is actually a misnomer. Asphyxia is a condition caused by interference with respiration

or due to lack of oxygen in inspired air due to which the organs and tissues are deprived of oxygen causing unconsciousness or death. The classical features of asphyxia are found when the air passage is constricted by pressure applied to the neck or the chest and when there has been struggle to breathe.² In Forensic context, asphyxia is usually obstructive in nature, where some physical barrier prevents access of air to lungs. This obstruction can occur at any point from the nose and mouth to the alveolar membranes, other conditions in which the body cannot gain sufficient oxygen may occur without any obstruction to the cells of the body. It is now surprising that clinical and pathological features of many different types of asphyxia vary.³ Nervous tissues are affected first by deficiency of oxygen and their functions are disturbed even by mild oxygen deficiency. Sub-normal oxygen in the blood supply to the brain causes rapid unconsciousness. In all forms of asphyxia, heart may continue to beat for several minutes' after stoppage of respiration. The various types of asphyxia are mechanical asphyxia, pathological asphyxia, toxic asphyxia, environmental asphyxia, traumatic asphyxia, postural/positional asphyxia and iatrogenic asphyxia. In mechanical asphyxia, the air

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passage is blocked mechanically. In pathological asphyxia, the entry of air into the lungs is prevented by disease of upper respiratory tract or lungs. In toxic asphyxia, poisonous substances prevent the use of oxygen as in poisoning by carbon monoxide and cyanide poisoning. In environmental asphyxia, there is insufficiency in the inspired air in enclosed places, trapping in an unused refrigerator or trunk. In traumatic asphyxia there is external compression of chest and abdominal wall interfering the respiratory movements. In asphyxia deaths, deprivation of oxygen for 5 to 10 minutes can result in permanent damage of central nervous and cardiovascular systems resulting in death. The cardinal signs of asphyxia namely cyanosis, increased capillary permeability and petechial haemorrhage develop when mechanical obstruction to breathing is maintained for 15-30 seconds. Cyanosis is the blue coloration of the skin by the presence of deoxygenated blood in the congested venous system and possibly in the arterial system.

Petechial hemorrhages are described in the nineteenth century by Professor Ambroise Tardieu as tiny pin point hemorrhages most commonly seen in the skin of the head and face and especially in the lax tissues of the eyelids, conjunctivae and sclera of the eye. These are due to leakage of blood from small venules as a result of the raised pressure in the venous system. They are not diagnostic of asphyxia because they can appear instantaneously in the face and eyes following a violent episode of sneezing or coughing.⁴ The incidence of asphyxial deaths are increasing in recent years. Death due to hanging is not unusual across the world and it comprises of the majority of asphyxia deaths. Hanging in its face value goes in favour of being suicidal in nature. The age of the victims may be anywhere between extremes of ages, i.e. between 10 to 80 years. Both sexes are equally prone and incidents in both sexes are more or less same.⁵ Homicidal hanging is rare; usually it occurs in Judicial hanging and lynching. Strangulations are homicidal in nature. Strangulation caused by other materials, palmar strangulation, garroting and mugging, if diagnosed properly, then must be taken as homicide in nature, except in some cases of house collapse and when a beam like structure falls on the neck of a lying person.⁵ Suffocation deaths results from the exclusion of air from lungs by means other than compression of neck. It is almost always homicidal and the victim is usually an infant or an elderly person exception is overlaying which is accidental in nature seen in newborn nursed by mother and ethanol intoxication. Death due to drowning is one of the most difficult causes of death to prove at postmortem, especially when the body is not examined

in a fresh condition. Accidental drowning is most common, and seen in children, bathers, fishermen, dockworkers, accidental fall in wells, precipitate labour, intoxicated and epileptic subjects. Suicidal drowning is common among females. Homicidal drowning is not very common, though it is one of the methods of choice in infanticide, especially of new born.¹

This study was carried out to find out the frequency of reported asphyxial deaths in relation to sex, socio-economic status as well as to investigate the cause and manner of such deaths.

MATERIALS AND METHODS

This retrospective study was carried out in the Department of Forensic Medicine & Toxicology, Dhaka Medical College from January 2019 to December 2019. A total of 61 cases were studied. During post mortem, dissection of the neck was done by giving a "modified Y incision". All external and internal findings were observed and documented during the autopsy procedure. Special care was given to note the pattern of injury marks on the neck in cases of hanging, strangulation and suffocation. Data was collected from the findings of the postmortem reports, inquest report and challan. Bodies were categorized according to the types of asphyxia, patterns of injuries, sex, socio-demographic factors, probable cause and manner of death. Collected data were then analyzed and were presented in tables below.

RESULTS

Table I shows that 63.93 % of asphyxia deaths were due to hanging, 16.39% were due to drowning, 13.11% was due to strangulation and remaining 6.56% were due to suffocation.

Table I Data of asphyxia deaths

Unnatural death	Frequency	Percentage
Hanging	39	63.93%
Strangulation	08	13.11%
Suffocation	04	6.56%
Drowning	10	16.39%
Total	61	100%

Table II shows that 51.28% of the victims of hanging were female and 48.71% were male.

Table II Distribution of hanging according to sex (n=39)

Sex	Frequency	Percentage
Male	19	48.71%
Female	20	51.28%
Total	39	100%

Table III shows that 75% of the victims of strangulation were male and 25% were female.

Table III Distribution of strangulation according to sex (n=08)

Sex	Frequency	Percentage
Male	06	75%
Female	02	25%
Total	08	100%

Table IV shows that 75% of the victims of suffocation were female and 25% were male.

Table IV Distribution of suffocation according to sex (n=04)

Sex	Frequency	Percentage
Male	01	25%
Female	03	75%
Total	04	100%

Table V shows that most victims of drowning were male (90%) and remaining were female (10%).

Table V Distribution of drowning according to sex (n=10)

Sex	Frequency	Percentage
Male	09	90%
Female	01	10%
Total	10	100%

Table VI Frequency of asphyxial deaths in different socio-economic groups

Income taka/month	Status	(n)	Percentage
More than 15000tk	Upper	07	11.48%
5001- 15000 tk	Middle	12	19.67%
5000 tk & below	Low	42	68.65%
Total		61	100%

So, our study shows that 63.93% of asphyxia deaths are due to hanging, 16.39% are due to drowning, 13.11% are due to strangulation and remaining 6.56% are due to suffocation (Table I). 51.28% of the victims of hanging are female and 48.71% are male (Table II). Data of strangulation reveals that 75% of the victims are male and 25% are female (Table III). 75% of the victims of suffocation are female and 25% are male (Table IV). 90% of victims of drowning are male and only 10% victims are female (Table V). 68.65% of these victims belong to low socio-economic status. 19.67% belong to middle class and 11.48% to upper class families (Table VI).

DISCUSSION

Asphyxial deaths are identified on the basis of external injuries & pattern of ligature mark on the neck of the victim. Eviscerations of the cranial, thoracic and abdominal viscera were done so that the body is drained of blood. Such draining provides a clear blood

less field for better study of neck structures and prevents artificial seepage of blood in soft tissues of the neck.⁶ In hanging, the ligature mark is oblique, non-continuous and high up in the neck. In strangulation, ligature mark is transverse, continuous and placed below the thyroid cartilage. Throttling marks on neck, subconjunctival haemorrhage and protrusion of tongue are findings to look for. In drowning, asphyxia supervenes within 2 minutes after complete submersion and the heart stops in 2-5 minutes afterwards. A fine, white lathery froth is seen at mouth and nostrils. It may increase on compression of the chest. The presence of certain quantity of water with mud, sand, algae in stomach is strongly suggestive of death due to drowning. It is practically impossible to get water into stomach if a body is submerged after death.⁷ Regarding opinion, deaths due to hanging is suicidal until it is otherwise proved. All deaths due to strangulation are homicidal. Masochistic practice to get sexual gratification by partial asphyxiation may cause accidental death. In our study 63.93% of deaths are due to hanging, 16.39% are due to drowning, 13.11% are due to strangulation and remaining 6.56% are due to suffocation. These findings are similar to that of bulletin of WHO regarding the methods of suicide (International suicide and homicide pattern derived from WHO mortality database). In Canada, 44.4% was hanging and 2.1% strangulation in 2002-2003.⁸ In Australia, 45.4% hanging in 1998-2003 and strangulation was 1.5% in the same period. In our study, 51.28 % of the victims of hanging are females and 48.71% are males. The findings are similar to WHO statistics showing China to be the only country where suicide rate of females exceeds that of males, where the male to female ratio is 1:2 as observed by another study.⁸ In a study found that socio-economic conditions play an important role in the progressive rate of suicides and homicides.⁹ In our study, 68.65% of these victims belong to low socio-economic status, 19.67% belong to middle class and 11.48% to upper class families.

LIMITATIONS

This study is conducted in the department of Forensic Medicine & Toxicology, Dhaka Medical College over one year duration. As both the duration and sample size are small, further comprehensive study is needed to find out the overall scenario regarding the issue in Bangladesh.

CONCLUSIONS

Deaths due to asphyxia are one of the most important causes in violence deaths. The main contributors to the increase rate of suicide and homicide are due to depression, anxiety, drug addiction, financial insecurity,

loss of employment, social isolation, mental illness, poverty, economic inequality, high crime rates, easy availability of firearms, family disharmony, family breakdown etc. Determining the cause and manner of asphyxia deaths needs special skills of autopsy surgeon and it is a quite challenging task. In our study, we found that most of the asphyxia deaths were due to hanging. More people die from suicide than from homicide. The rate of suicide in female is more compared to male. Socio-economic factors have vital impact on the increasing rates of suicide and homicide seen over recent decades.

RECOMMENDATIONS

Multi centre with large sample size comprehensive study is to recommended to find out the actual picture of Bangladesh for this issue.

DISCLOSURE

All the authors declared no competing interest.

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