
ORIGINAL ARTICLE

Autopsy Based Epidemiological Study Of Violent Asphyxial Deaths In Punjab

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ABSTRACT

Introduction: Large proportion of medico-legal autopsies comprise of deaths due to violence. One of the major contributors to these deaths is violent deaths due to asphyxia.

Objective: This study is therefore aimed to determine the frequency and epidemiology of violent asphyxial deaths autopsied in major mortuaries of Lahore and Multan, to help the process of scientific crime investigation.

Material and Method: The study includes the retrospective evaluation of 119 deaths due to asphyxia out of the total number of autopsies that were conducted in the Forensic Medicine Departments of King Edward Medical University, Lahore and Nishtar Medical College, Multan over a period of two years from January 2012 to December 2013. The parameters studied were cause, manner, type of violent asphyxial death, age and gender of victim.

Results: 119 out of 2016 medicolegal deaths were due to violent asphyxia with incidence rate of 5.9%. The most vulnerable age group was 21-30 years (32.7 %). Asphyxial deaths were more common in males (52.1%). Male predominance was seen in all asphyxial deaths except strangulation and traumatic asphyxia. Smothering was common in young children while throttling was seen in extremes of ages. Ligature strangulation (36.97%) and hanging (34.45%) were leading causes of violent asphyxial deaths. All smothering, ligature and manual strangulation cases (100 %) were homicidal while all traumatic asphyxia cases were accidental (100%). Majority of hanging (90.29%) cases was suicidal whereas drowning cases were predominantly accidental (75%).

Conclusion: Males and young adult age group between 21–30 years are more vulnerable victims of violent asphyxial deaths. Homicidal deaths due to ligature strangulation and suicidal deaths as a result of hanging are the major causes of asphyxial deaths.

Key words: Violent asphyxial death, autopsy, epidemiology, homicide

INTRODUCTION

The term asphyxia (Greek meaning pulselessness) is defined as a condition caused by interference with respiratory exchange or due to lack of oxygen in inspired air due to which the organs and tissues are deprived of oxygen causing unconsciousness or death¹. From medicolegal point of view, asphyxia is divided into two broad groups: Mechanical and Non- Mechanical. Mechanical asphyxia is obstructive in nature where some physical barrier prevents entry of air to the lungs. This obstruction can occur at any level from nose and mouth to the alveoli. Non- mechanical asphyxia means physiological disturbances due to breathing in a vitiated atmosphere or by chemical interference with its uptake and utilization by the body itself². The pathognomonic features of asphyxia are found where the air passages are obstructed by pressure applied to the neck or to

the chest and where there has been a struggle to breathe. These are congestion, oedema of face, cyanosis and petechial hemorrhages³.

Violent unnatural deaths have been on the rise due to population overgrowth, poverty, illiteracy and increased emotional strains in daily life. Both genders are facing these problems but since ours being a male dominated society with males more active members and consequently more exposed to external environment, such cases are commonly encountered in them. With urbanization and industrialization, rural areas are also not left aloof as evident by increasing incidence of such cases reported from these areas as well⁴. Significant proportion of medicolegal autopsies comprises of violent unnatural deaths that may be suicidal, homicidal or accidental. One of the major contributors to these deaths is violent deaths due to asphyxia. These may be classified as hanging,

ligature strangulation, manual strangulation (throttling), smothering, choking, traumatic asphyxia and drowning⁵.

Objective

This study is therefore aimed to determine the frequency of violent asphyxial deaths autopsied in major mortuaries of Lahore and Multan, to analyze the epidemiological trend and pathological aspects of asphyxial deaths in Punjab and to add to the existing volume of knowledge in the subject with the view to help the process of scientific crime investigation and administration of criminal justice.

MATERIAL AND METHOD

This retrospective study of violent asphyxial deaths is carried out in Forensic Medicine Departments of King Edward Medical University, Lahore and Nishtar Medical College, Multan over a period of two years from January 2012 to December 2013. A total of 2016 medicolegal autopsies were conducted during the period; out of which 119 cases were due to violent mechanical interference with respiration. These 119 cases were meticulously scrutinized by review of history, police papers and postmortem findings etc. The

parameters studied were cause, manner, type of violent asphyxial death, age and gender of victim. The findings/data were recorded on a specially designed proforma and tabulated using SPSS version 15.

RESULTS

A total of 2016 medico legal autopsies were conducted during the two year period from January 2012 to December 2013. Out of these, 119 cases were due to violent asphyxial deaths, with the incidence rate of 5.9% (Table 1).

Almost one third of the total asphyxial deaths belonged to age group 21 – 30 years (32.7 %) followed by 11 –20 years (20.1 %) while the least common age group was 61-70 years (1.68%). Amongst the asphyxial deaths, hanging and ligature strangulation was predominant in younger age group (21-30 yrs). Smothering was seen in young children (1.68%) while throttling was noticed in children and older people (3.36%) (Table 2).

The sex wise distribution was found to be male dominance (52.1%) except in the case of strangulation and traumatic asphyxia which were more common in females (Table 3).

Table1: Incidence of violent asphyxial deaths

Total number of autopsies conducted	Violent asphyxial deaths	Percentage of asphyxial deaths
2016	119	5.9%

Table 2: Distribution of violent asphyxial deaths in relation to age

Type of asphyxia	0-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	Total
Hanging	-	7	14	9	9	2	-	41(34.45%)
Ligature Strangulation	2	13	18	7	4	-	-	44(36.97%)
Throttling	1					1	2	4 (3.36%)
Smothering	2		-	-	-	-		2(1.68%)
Traumatic asphyxia	2	4	-	-	-	2	-	8(6.72%)
Drowning	8	-	7	3	2	-	-	20(16.8%)
Total	15 (12.6%)	24 (20.1%)	39 (32.7%)	19 (15.9%)	15 (12.6%)	5 (4.2%)	2 (1.68%)	119 (100%)

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Table 3: Distribution of violent asphyxial deaths in relation to gender

Cause of death	Male	Female	Total	M/F Ratio
Hanging	27	14	41(34.45%)	1.9:1
Ligature Strangulation	16	28	44(36.97%)	0.57
Manual Strangulation	1	3	4 (3.36%)	0.33
Smothering	2	-	2(1.68%)-	-
Traumatic asphyxia	2	6	8(6.72%)	0.33
Drowning	14	6	20(16.8%)	2.3:1
Total	62(52.1%)	57(47.9%)	119 (100%)	1.1:1

Table 4: Distribution of violent asphyxial deaths in relation to manner of death

Cause of death	Homicidal	Suicidal	Accidental	Total
Hanging	4	37	-	41(34.45%)
Ligature Strangulation	44	-	-	44(36.97%)
Manual Strangulation	4	-	-	4 (3.36%)
Smothering	2	-	-	2(1.68%)
Traumatic asphyxia	-	-	8	8(6.72%)
Drowning	5		15	20(16.8%)
Total	59(49.5%)	37(31%)	23(19.3%)	119 (100%)

Ligature strangulation (36.97 %) and hanging (34.45 %) were the leading causes of violent asphyxial deaths. All ligature and manual strangulation cases (100 %) were homicidal while all traumatic asphyxia cases were accidental (100%). An overwhelming majority of hanging (90.29%) cases was suicidal whereas drowning cases were predominantly accidental (75%) shown in Table 4.

DISCUSSION

Violent asphyxial deaths make a considerable proportion of our medicolegal autopsies. In this study, the rate of violent asphyxial deaths was 5.9% i-e 119 cases out of 2016 medicolegal autopsies. This is in accordance with a four year study conducted in India in which out of the 2110 cases being autopsied, 111 cases were of violent asphyxia with the incidence rate of 5.26%⁶. Incidence of violent asphyxial deaths was 5.63% of total autopsies in a study from Gujarat, India⁷ consistent with the study. Autopsy- based study in Karachi revealed the incidence rate of 7.08 % as out of 2090 medico legal deaths autopsied, 148 cases were reported to be due to violent asphyxia which is close to the study⁸. However, it is at variance from 21 years study from Turkey having an incidence of 15.7%⁹ which is considerably high. This can be explained on the basis of different

regions of the study and longer duration of study period in the latter case.

Ligature strangulation (36.97 %) was the leading cause of violent asphyxial deaths in the study. Strangulation is one of the most common forms of violent asphyxia accounting for approximately 10–20% of all homicidal deaths in a number of countries¹⁰, thereby representing a notable cause of death in homicide victims. A seven year study in Karachi reported that 15.8% cases of strangulation were exhumed¹¹. In a study from 2009 to 2012 in Peshawar, ligature strangulation was the most common method of violent asphyxia¹². Strangulation cases were also on the rise in honour killing victims in a study done by Human Rights Commission¹³. All these studies are in agreement to the present study. This study reported hanging (34.45 %) as the second common cause of asphyxial deaths. According to previous studies, the percentage of hanging was 41.8% in Turkey⁹, 44.4% in Canada¹⁴, 45.4% in Australia¹⁴ and 45% in Bangladesh¹ which are comparable to our study.

This study showed maximum number of cases (32.7%) in 21- 30 years age group followed by 11-20 years (21.8%) and 31-40 years (15.9%) respectively. Majority of the cases belonged to age group 21–30 years (35.79%); second and third largest groups were 11-20 years (20.30%) and 31-40 years (17.89%) in a four year study conducted

in India thus in agreement with our findings¹⁵. This young adult group is the most active phase of life in which there is more exposure to external environment and stress and strains of life. Violent asphyxial deaths were least common in extremes of ages i.e. (12.6%) in 0-10 years age group and 1.68% in victims more than 60 years of age in our study. This is quite similar to the study in Karachi which found that 10.1% victims were less than 15 years and 5.4% above 55 years of age⁸. Predominance of hanging and ligature strangulation in third decade of life was also reported by studies from Karachi and Delhi^{8,16}. Maximum number of drowning cases belonged to the early age group in our study which is in line with an autopsy based study conducted at the Mortuary of Civil Hospital, Ahmedabad, India⁷. In some countries drowning is the first or second leading cause of death in children¹⁷. The reason is lack of knowledge to swim in the water in this age group. Smothering was noticed in children also reported by study from Karachi⁸ while throttling was seen in extremes of ages which can be attributed to less resistance or struggle in these age groups.

Males (52.1%) outnumbered females (47.9%) in our study. The study of 542 cases of violent asphyxial deaths in Varanasi, India from January 2008– December 2011 reported that the males constituted 60.8% of all violent asphyxial deaths¹⁵ which is in line with our study. Males predominated both in hanging (65.85%) and drowning (70%) in our study. A study conducted in Rajkot, India found that 66.6% males died due to hanging¹⁸. A five year study of 761 cases of suicidal hanging in Turkey reported 70.56% male victims¹⁹. Males are more vulnerable because they, being the breadwinners in our society, are expected to bear the family expenditures thus facing the stress and strains of life. This pressure is sometimes too much for them to bear and they end their lives by hanging themselves. Majority of victims of deaths due to drowning were males in studies from Italy (81.9%)²⁰ and South Africa (80.1%)²¹. The high incidence of drowning among the males may be due to their extrovert personality and more active life style with tendency to take undue risks making themselves more vulnerable to fatal outcome. All these studies are in agreement with the present study.

The study reflected female predominance in ligature (63.63%) and manual strangulation (75%). This is in accordance with a study from Patiala,

India which reported that female victims constituted 66.66% of violent asphyxial deaths caused by ligature strangulation⁶. A study from America²² reported 41 deaths due to manual strangulation out of which 65.85% were females which is close to the study. The possible explanation for this is strangulation is the method preferred by assailants having physical strength greater than their victims thus overpowering them easily. Usually these cases are reported with sexual assault.

In this study 8 cases of traumatic asphyxia were recorded, out of which 6 cases were of females. This is in contrast to study from Karachi which showed male predominance⁸. Female preponderance in traumatic asphyxia may be due to the reason that females stay mostly indoors engaged in household chores and this being mostly accidental in manner was caused by falling structures (ceiling fans, roof and beams) inside the house in this study.

Homicide was the most common manner of death also reported by a four year study conducted at forensic medicine and toxicology department, Khyber medical college, Peshawar¹². Unfortunately poverty, illiteracy, family feuds over old conflicts and disputes of property, sudden provocation, honor killing and subversive acts have become hallmark of one society which has direct effect on the conduct of common man contributing to a rise in rate of homicide. All strangulation and smothering cases were homicidal in the present study. This is in accordance with the studies conducted in Karachi⁸, Peshawar¹² and Lahore²³ reporting strangulation and smothering as common method of homicide especially in females and children. Ligature strangulation was also reported as the more frequently recorded method of asphyxial homicide in studies from Germany²⁴, India²⁵, Turkey²⁶ and Japan²⁷. Manual strangulation and smothering are the common methods of homicide in females and young children who are weaker and offer less or no resistance that can be easily overcome by the assailant. This fact is supported by the findings of the study. An overwhelming majority of hanging cases (90.29%) was suicidal whereas drowning cases (75%) were predominantly accidental. All cases of hanging should be considered as suicidal until proved otherwise^{2,3,5}. These findings are also comparable to that of bulletin of WHO regarding the methods of suicide¹⁴. In studies from Karachi⁸ and Lahore²³, all hanging cases were suicidal

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while accidental manner of death was seen in all drowning cases. Hanging as the method of choice for committing suicide was also reported by studies from Australia²⁸ and Saudi Arabia²⁹. A South African study in 2004 found that 81.1% cases of drowning were accidental²¹. Similarly, a study on characteristics of the drowned in Khuzestan province of Iran during 2002-2006 reported 88.7% cases of accidental drowning³⁰. All these studies are in accordance with the present study.

CONCLUSION

Males and young adult age group between 21–30 years are more vulnerable victims of violent asphyxia deaths. Homicidal deaths due to ligature strangulation and suicidal deaths as a result of hanging are the major causes of asphyxial deaths. Both these manners of death indirectly reflect frustrating and aggressive behaviour of the youth with lack of self constrain. A well designed and comprehensive programme is needed to identify the causative factors and take appropriate measures for their prevention on urgent basis. Appropriate education, positive role of media in their reporting method, strict law enforcement may reduce the rate of violent asphyxial deaths in future.

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