ORIGINAL ARTICLE

Medicolegal Investigation of Violent Asphyxial Deaths - An Autopsy Based Study

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ABSTRACT

Objective: To determine the frequency of violent asphyxial deaths autopsied in three major mortuaries of Karachi along with age and gender vulnerability.
Study Design: Autopsy- based descriptive cross-sectional study.
Place: Mortuaries at Civil, Jinnah Postgraduate Medical Center and Abbasi-Shaheed Hospital Karachi.
Duration of study: Autopsies conducted during March 1, 2008 to February 28, 2009.
Patients and method: Out of 2090 medicolegal deaths autopsied at three centers of Karachi during the study period, details were collected for those medicolegal deaths identified to be due to violent asphyxial deaths. Findings were recorded in a purpose built Performa under the headings of natural and unnatural deaths according to the disease, cause, manner, causative agent, age and gender.
Results: 148 out of 2090 medicolegal deaths were identified to be violent asphyxial deaths, making incidence rate 7.08%. There were 112(75.68%) males and 36(24.32%) females. Male predominance was seen in all asphyxial deaths except manual strangulation and smothering. Age group in the range of 15 – 35 years was chiefly affected. Smothering was seen in young children. Hanging and drowning were leading causes of violent asphyxial deaths. 100% suicide and homicide manner of death were reported in hanging and strangulation respectively.
Conclusion: Males and young age group population between 15 – 30 years are more vulnerable victims of violent asphyxial deaths. Suicidal deaths as a result of hanging and accidental deaths as a result of drowning seem to be the major contributing causes of violent asphyxial deaths.

Key words: Violent asphyxial death, mortuaries, autopsy, suicide.

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INTRODUCTION

With the increase in crime, the count and variety of medicolegal deaths has increased tremendously in the recent years. Investigation of medicolegal deaths, as a part of medical issues, requires certain queries to be answered by medical man like manner, cause, and time since death which is only possible when a meticulous autopsy is performed.[1] Unnatural causes of death include lethal sequalae of traumatic effects on body such as fire arm, assault with sharp and blunt weapons, bomb blast, violent compression of neck by ligature or hand, poisoning, thermal injury and road traffic accidents etc.

Violent asphyxial deaths have contributed considerably to unnatural homicidal, suicidal and accidental deaths. Various violent asphyxial deaths include hanging, ligature and manual strangulation, smothering, traumatic asphyxia, choking and drowning. Hanging is one of the leading manners of suicide in which there is suspension of body by a ligature compressing the neck externally, the constricting force being the weight of the body.[2] Hanging is always considered suicidal except accidental hanging in sexual perverts, homicidal in lynching and justifiable judicial hanging. In England and Wales hanging accounts for about 2000 deaths each year and considered the most common method of suicide.[3] In United States of America 92.3% of all suicides were caused by firearms, hanging and poisoning.[4] A report from Canada has also indicated hanging as the second most common method of suicide after suffocation. [5]

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Strangulation is a form of asphyxial death in which there is compression of neck structures by a force other than the body's own weight. The force may be exerted by different means such as ligature, hands when it is known as throttling or manual strangulation, elbow (mugging) and bamboos (bansdola).[6] Deaths by strangulation are always considered homicidal but it may be accidental as seen in cases where law enforcers use choke holds to control the suspects as well as in wrestling, commonly known as mugging i.e. compressing the neck against elbow folds. Choking games known by different names as "Scarf game, black out game, pass out game or space monkey", defined as self strangulation or strangulation by another person with hands or noose to achieve a brief euphoric state have been reported amongst the youths in United States of America during 1995 – 2007.[7]

In drowning the access of air to the lung is prevented by submersion of body in water or fluid medium. It may be fresh or sea water depending upon the water in which the person is drowned.[8] Death due to drowning is common globally. Studies by United Nation's World Health organization have shown that throughout the region of South Asia, about 90,000 people drown every year. Most of the South Asian countries have higher drowning death rates than the world average.[9] Italy, in a 20 years study from 1969 to 1998 has reported 24,496 deaths due to drowning. The death rate decreased from 22.7 to 5.2 deaths per million annually over the period of study, representing 77 % decline.[10]

Fatal accidental or homicidal smothering as a result of occlusion of external air passages i.e. nose and mouth is commonly seen in infants or young children though the old, weak, debilitated adults, epileptics and person under intoxication may be smothered. There may be no finding at autopsy if a soft pillow, cloth or cushion is used even in cases of homicide. Careful examination, interpretation of history and crime scene observation may be rewarding in such cases and avoid miscarriage of justice.[11] Another form of asphyxial death is "Traumatic asphyxia" or "Crush asphyxia" which is associated with prevention of respiratory movement due to compression of, or penetrating trauma to the chest. Traumatic asphyxia is mostly accidental. It presents with cervico-facial cyanosis, subconjunctival hemorrhages, marked petechial hemorrhages over face, neck and upper part of chest due to compressive force to thoraco abdominal regions.[12]

In Pakistan no detailed medico legal study has been conducted on this important aspect of deaths, only study from Faisalabad and Karachi on suicidal deaths has reported hanging as the leading cause of suicide.[13,14] This study is therefore aimed to determine, the frequency of violent asphyxial deaths autopsied in three major mortuaries of Karachi along with age and gender vulnerability.

MATERIAL AND METHODS

An autopsy based descriptive cross-sectional study was conducted on 148 violent asphyxial deaths autopsied during the period from March 1, 2008 to February 28, 2009 at Civil Hospital, Jinnah Postgraduate Medical center, and Abbasi Shaheed Hospital Karachi. A total of 2090 medicolegal deaths were autopsied meticulously in three centers of Karachi during the study period, to determine cause and manner of death, out of which details were collected for those medicolegal deaths identified to be due to violent asphyxial deaths. A purpose built Performa was designed for this particular study and findings were recorded under the headings of natural and unnatural deaths according to the disease, cause, manner, causative agent, age and gender.

In this study we included those cases in which death could only be attributed to the direct effect of mechanical interference of the process of respiration leading to asphyxia and ultimately death.

All those medicolegal deaths in Karachi by means other than violent asphyxial death, or the cases in which autopsies were not performed or dead bodies handed over to the relatives without proper autopsy were excluded.

Data was entered in a Microsoft Excel spreadsheet and analyzed using SPSS version 15. The frequency and percentages were calculated for all categorical variables.

RESULTS

A total of 2090 medico legal autopsies conducted during the period from March 1, 2008 to February 28, 2009 out of which 148 cases were due to violent asphyxial death, making the incidence rate 7.08%. (Table I)

Table I: Incidence of violent asphyxial death

Total No. of Autopsies Conducted	Violent Asphyxial death	Percentage of Asphyxial death
2090	148	7.08

Among the asphyxial deaths, there were 112 (75.68%) males, and 36 (24.32 %) females.. Males were predominantly involved in all reported asphyxial deaths, except in manual strangulation and smothering. (Table II)

Table II: frequency of asphyxial death in relation to gender

Cause of death	Male	Female	Total
Hanging	39	15	54 (36.48%)
Ligature Strangulation	14	10	24 (16.21%)
Manual Strangulation	04	08	12 (8.1%)
Smothering	01	02	03 (2.02%)
Drowning	47	01	48 (32.43%)
Traumatic Asphyxia	07	-	07 (4.72%)
	112 (75.68%)	36(24.32%)	148 (100%)

Almost one third of the reported asphyxial deaths belonged to age group 15 – 25 years making 33.1 % of total deaths. Second largest age group was in the range of 25 – 35 years contributing 27.7 % of the total deaths. Amongst the asphyxial deaths smothering was noticed in young children indicating least resistance or struggle in this group of age. (Table III)

Table III: Frequency of asphyxial death in relation to age

Age (Year)	Hanging	Strangulation	Smothering	Drowning	Traumatic asphyxia	Total n (%)
<1 Year	-	-	1	01	-	02 (1.35)
1 - < 15	02	-	2	09	-	13(8.75)
15 - <25	20	16	-	13	-	49(33.1)
25 - <35	16	08	-	17	-	41(27.7)
35 - <45	08	06	-	04	3	21(14.18)
45 - <55	05	03	-	02	4	14(9.4)
55 Years	03	03	-	02	-	08 (5.4)
Total	54	36	3	48	07	148

Hanging and drowning were the leading causes of violent asphyxial deaths contributing 36.48 % and 32.43 % respectively. All hanging cases (100 %) were suicidal while all ligature and manual strangulation cases (100 %) were homicidal. In case of drowning and traumatic asphyxia accidental manner of death was found in all cases. (Table IV)

Table IV: Frequency of asphyxial death in relation to manner of death

Cause of death	Manner of death			
	Accidental	Homicidal	Suicidal	Total
Hanging	-	-	54	54
Ligature Strangulation	-	24	-	24
Manual Strangulation	-	12	-	12
Smothering	01	02		03
Drowning	48			48
Traumatic Asphyxia	07	-	-	07
	56	38	54	148

DISCUSSION

The incidence rate of asphyxial death in this study is found to be 7.08 as out of 2090 medico legal deaths autopsied, 148 medicolegal deaths were reported to be due to violent asphyxia. A study conducted in India has also reported 2110 medicolegal deaths out of which 111 cases belonged to violent asphyxial death with 5.26% incidence rate of asphyxial death over a period of four years which is close to our study.[15] Violent asphyxial deaths comprising15.7% of all forensic death have also been reported in a study from Turkey[16] which is considerably high. This might be due to longer duration of study period of 21 years. Our study shows 75% male involvement, more or less similar to the study of Turkey[16] in which male constituted 79.8% of all cases. Another retrospective study of autopsies conducted during the period from 1998 to 2002 in Turkey, reported 70.56% male cases and 29.44% female cases committing suicide by hanging.[17] A ten year study of Delhi, India reported 3:2 male to female ratio of medicolegal deaths caused by strangulation.[18] Our study has shown similar result in which male to female ratio is 1.4:1 in deaths caused by strangulation. Death due to drowning has shown remarkable male involvement in our study i.e. 97.92% males and 2.08% female. This is in accordance with the study conducted in other countries which shows 81.9% and 80.1% male involvement respectively.[10,19] The high incidence of drowning among the males may be due to their life style which causes them to confront dangers without thinking that death may result. In this study 7 cases of traumatic asphyxia were recorded which were due to fall of ceiling fan, roof and beam and all cases were of males. Indian study conducted during 2000 to 2003 has also shown 7 medico legal deaths due to traumatic asphyxia out of which 6 were males.[15] The major involvement of male in traumatic asphyxial deaths is due to their strenuous physical work and environmental exposure to work disasters. Our study has reflected female predominance in two types of violent asphyxial deaths i.e. smothering and manual strangulation. A study from America[20] has reported 41 deaths due to manual strangulation out of which 27 were females and 14 males which is close to our study in which total deaths due to manual strangulation were 12 out of which 8 were female and 4 were males. Manual strangulation and smothering are always homicidal and females and young children are main victims of these violent asphyxial deaths. Females and children are weak and they offer least resistance, moreover female deaths are usually associated with sexual assault. In this study maximum incidence of violent asphyxial deaths was seen in age group ranged from 15–25 years and then in 25–35 years of age, contributing 33.11%

and 27.70% of the total asphyxial deaths. If we add the two groups, it makes 60 % of the total violent asphyxial deaths. It clearly indicates that young adults are the main victims of violent asphyxial deaths. In a study from New Zealand conducted in 1999 it is reported that young people aged between 15–24 years accounted for 65% of male, and 75% of female youth suicides by hanging.[21] In a Pakistani study, conducted in Faisalabad during the period from January 1st 1998 to December 31st 2001 on suicide has shown that distribution of maximum number of cases of suicide in males was in age group between 20–29 years, while in females it was 10–19 years.[22] A ten year Indian study has also reported maximum incidence of death as a result of strangulation in third decade of life.[18] Our study has shown that hanging and drowning are most frequent causes of violent asphyxial death, contributing 36.48% and 32.43% of total asphyxial deaths respectively. In hanging suicidal manner of death was found in all cases while accidental manner of death was seen in all drowning cases. An autopsy based study at South Delhi by Department of Forensic Medicine, All India Institute of Medical Sciences has also reported hanging as leading cause of suicide.[22] Study from Faisalabad and Aga Khan University, Karachi on suicide have reported hanging as the leading cause of suicide. A South African study has reported that out of 567 cases of drowning in 2004, 81.1% were unintentional.[19] Similarly a study on epidemiology of drowning from Isfahan province of Iran has also reported 85.1% accidental drowning.[23] All these studies are in accordance with our study and reported suicidal manner of death in hanging and accidental in case of drowning. Ligature and manual strangulation in our study is found to be homicidal in all cases. Most of the studies conducted in various countries reported strangulation as common method of homicide particularly practiced on women and young children.[24-25] Manual strangulation and smothering are the methods of homicide usually adopted by criminals who are physically strong as compared to their victims and this is furnished by our finding of female predominance in manual strangulation and smothering. Our study has provided fact finding evidence that smothering is practiced over children.

Karachi is the thickly populated city of Pakistan, accommodating all racial groups of its various provinces and therefore the toll of medicolegal deaths has increased tremendously. Violence in this city has also increased which has demanded responsibility particularly from those who handle these aspects of death to investigate on scientific basis, so that miscarriage of justice is avoided. We have, therefore, conducted this study to find out the exact frequencies of violent asphyxial deaths with gender and age vulnerability.

CONCLUSION

Males and young age group population between 15–30 years are more vulnerable victims of violent asphyxial deaths. Suicidal deaths as a result of hanging and accidental deaths as a result of drowning seem to be the major contributing causes of asphyxial deaths. Both these manner of deaths, some how, indicates frustration and carelessness on the part of population which are preventable and needs to be rectified on urgent basis. More over these cases of suicide should serve as an eye opener for organizations working for socio economic justice in our country.

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