



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(11): 464-470
© 2018 TPI
www.thepharmajournal.com
Received: 24-09-2018
Accepted: 25-10-2018

Satish Kumar Khalkho
Junior Resident (JR-III),
Department of Forensic
Medicine, Institute of Medical
Sciences, Banaras Hindu
University, Varanasi, Uttar
Pradesh, India

Manoj Kumar Pathak
Professor Department of
Forensic Medicine, Institute of
Medical Sciences, Banaras Hindu
University, Varanasi, Uttar
Pradesh, India

Socio-demographic and medico-legal study of violent Asphyxial deaths in Varanasi region

Satish Kumar Khalkho and Manoj Kumar Pathak

Abstract

Introduction: The term 'asphyxia' literally means lack of oxygen, though etymologically, asphyxia means 'absence of pulsations'. Death is said to have occurred due to asphyxia, when respiratory function ceases first and initiates the process of failure of other two vital systems. In asphyxia, there is prevention of exchange of air between the atmosphere and the alveoli of lungs and there is lack of oxygen supply to the tissues.

Materials and Methods: The study was conducted in Department of Forensic Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi; Uttar Pradesh. It is a retrospective study. The study was conducted during October 2016 to March 2018. The parameters studied were cause, manner and types of asphyxial deaths, education, occupation, socio-economic status, motive, age and gender of victims.

Results: Total 150 out of 2976 medico-legal deaths were identified to be due to violent asphyxia with incidence rate of 5%. Asphyxial deaths were more common in males (61.33%). Most common age group involved was 21-30 years. Hanging was the most common method of death constituting 57.33 % of cases followed by drowning 24.0% cases, strangulation 4.67%.cases, smothering 0.67%.cases and traumatic asphyxia 12%.

Conclusion: Males and young age group population between 21-30 years are more vulnerable victims of violent asphyxia deaths. Suicidal deaths as a result of hanging and drowning, accidental deaths as a result of traumatic asphyxia seem to be the major contributing causes of violent asphyxial deaths.

Keywords: Hanging, strangulation, drowning, traumatic asphyxia, smothering

Introduction

The term 'asphyxia' literally means lack of oxygen, though etymologically, asphyxia means 'absence of pulsations'. Death is said to have occurred due to asphyxia, when respiratory function ceases first and initiates the process of failure of other two vital systems. In asphyxia, there is prevention of exchange of air between the atmosphere and the alveoli of lungs and there is lack of oxygen supply to the tissues ^[1].

Asphyxial deaths are caused by the failure of cells to receive or utilize oxygen. The deprivation of oxygen can be partial (hypoxia) or total (anoxia). The classical signs of asphyxia are visceral congestion, petechiae, cyanosis and fluidity of blood ^[2].

Asphyxial deaths have contributed considerably to unnatural manners of homicidal, suicidal and accidental deaths. Among various mechanical asphyxia like hanging, strangulation, smothering, throttling, traumatic asphyxia, choking and drowning, hanging is one of the leading manner of suicide. In hanging, there is suspension of the body by a ligature material compressing the neck externally. The constricting force is weight of the body or weight of the head ^[3].

Strangulation is another form of asphyxial death in which there is compression of neck structures by a constricting force other than the body's own weight. The force may be exerted by different means such as ligature, by use of hand, when it is known as throttling or manual strangulation, elbow (mugging) and bamboos (bansdola) ^[4].

In drowning, a global phenomenon, replacement of column of air by column of water occurs. It may be fresh or sea water depending upon the water in which the person is drowned. India is a vast country having plenty of water bodies' i.e. Rivers, ponds, wells, and an extensive seacoast. According to global burden of disease (GBD) study done by W.H.O. in 2010, global mortality from drowning to be 7% of all asphyxial deaths. The World Health Organization estimated the annual global incidence of death by drowning to be 4, 00,000 ^[5]. According to data from the Global Burden of Disease, during year 2000,

Correspondence

Satish Kumar Khalkho
Junior Resident (JR-III),
Department of Forensic
Medicine, Institute of Medical
Sciences, Banaras Hindu
University, Varanasi, Uttar
Pradesh, India

around 449,000 while drowning also cost 1.3 million years of lost life and disability. Accidental drowning occurs often in India, nearly 40,000 Indians die annually from drowning. An example of accidental drowning is post-immersion-submersion syndrome which may occur in epileptics or intoxicated person [6].

Another form of asphyxia death is “Traumatic asphyxia” or “Crush asphyxia” which is associated with prevention of respiratory movements due to compression of or penetrative trauma to the chest. Traumatic asphyxia is mostly accidental in nature. It presents with cervico-facial congestion, sub-conjunctival hemorrhages, marked petechial hemorrhages over face, neck and upper part of chest due to compressive force to thoracoabdominal regions [7].

Material and Methods

Cases included in the present study were selected from dead bodies brought to the mortuary of the Department of Forensic Medicine, IMS, BHU; Varanasi for medico-legal autopsy, from the various Police Stations of Varanasi regions. Total 150 cases of different kinds of asphyxial deaths, such as hanging, strangulation, smothering, throttling, drowning and traumatic asphyxia were analyzed in this study from October 1, 2016 to March 31, 2018.

The various epidemiological details i.e. age, sex, habitat, religion, educational status, occupational status, marital status,

socioeconomic status, mental condition, personal and family history etc. along with the name of the police station, which brought the dead body, were collected.

Observations and Results

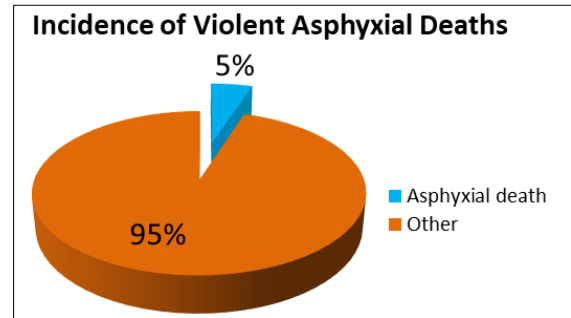


Fig 1: Incidence of Violent Asphyxial Deaths amongst all Autopsied cases (October 2016 to March 2018)

Table 1: Gender-wise distribution of Violent Asphyxial Death cases

Gender	Frequency	Percentage (%)
Male	92	61.33
Female	58	38.67
Transgender	0	0
Total	150	100

Table 2: Age and Gender wise distribution of Violent Asphyxial Death cases

Age in years	Male (n= 92)		Female (n=58)		Total	
	No.	%	No.	%	No.	%
0 – 10	1	1.09	1	1.72	2	1.33
11 – 20	11	11.96	7	12.07	18	12.00
21 – 30	36	39.13	24	41.38	60	40.00
31 – 40	17	18.48	11	18.97	28	18.67
41 – 50	11	11.96	5	8.62	16	10.67
51 – 60	9	9.78	6	10.34	15	10.00
61 – 70	5	5.43	4	6.90	9	6.00
71 – 80	0	0.00	0	0.00	0	0.00
81 – 90	2	2.17	0	0.00	2	1.33
Total	92	100.00	58	100.00	150	100.00

Table 3: Habitat wise distribution of Violent Asphyxial Deaths

Community	Frequency	Percentage (%)
Rural	43	28.67
Urban	60	40.00
Sub-urban	41	27.33
Unknown	6	4.00
Total	150	100

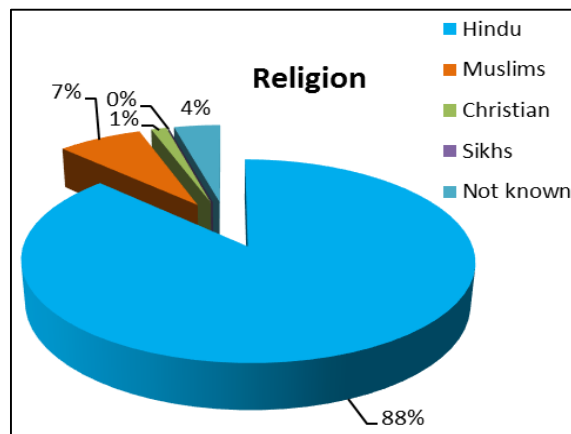


Fig 2: Religion wise distribution of Violent Asphyxial Death cases

Table 4: Incidence of Violent Asphyxial Death cases according to marital status

Marital Status	Male		Female		Total	
	No.	%	No.	%	No.	%
Married	50	54.35	39	67.24	89	59.33
Unmarried	37	40.22	18	31.04	55	36.67
Unknown	5	5.43	1	1.72	6	4
Total	92	100	58	100	150	100

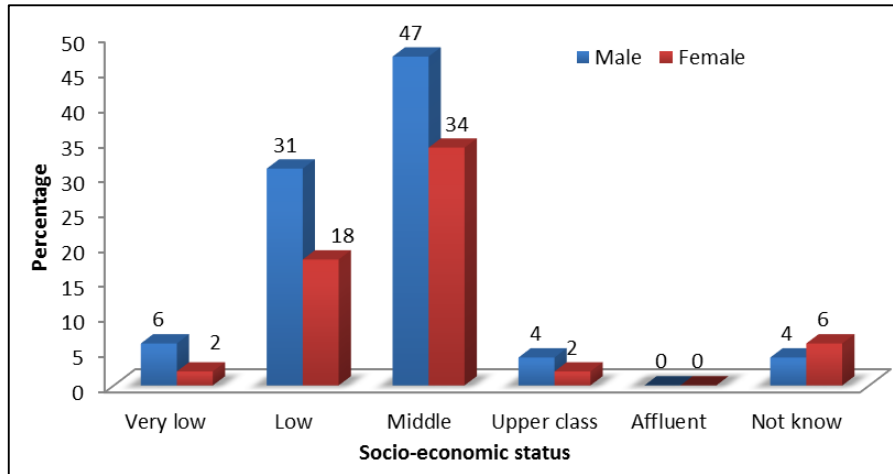


Fig 3: Gender-wise distribution of socio-economic status of victims of Violent Asphyxial Death cases

Table 5: Distribution of Violent Asphyxial Deaths cases on the basis of manner

Manner of death	Frequency	Percentage (%)
Suicidal	117	78.00
Homicidal	10	6.67
Accidental	23	15.33
Total	150	100.00

Table 6: Distribution of cases of Violent Asphyxia Death on the basis of the type of death

Type of death	Frequency	Percentage (%)
Hanging	86	57.33
Strangulation	7	4.67
Throttling	2	1.33
Smothering	1	0.67
Drowning	36	24.00
Traumatic asphyxia	18	12.00
Total	150	100.00

Table 7: Gender-wise educational status of victims of Violent Asphyxial Deaths

Educational status (education)	Male (n=92)		Female (n=58)		Total	
	No.	%	No.	%	No.	%
Illiterate	15	16.30	10	17.24	25	16.67
Primary	5	5.43	10	17.24	15	10.00
Middle	6	6.52	5	8.62	11	7.33
High School	15	16.30	13	22.41	28	18.67
Higher Secondary	25	27.17	12	20.70	37	24.66
Graduate	21	22.87	7	12.07	28	18.67
Not-known	5	5.43	1	1.72	6	4.00
Total	92	100	58	100	150	100.00

Table 8: Occupational status of victims of Violent Asphyxial Deaths (gender-wise)

Occupation	Male (n=92)		Female (n=58)		Total	
	No.	%	No.	%	No.	%
Student	22	23.91	10	17.24	32	21.33
Business	7	7.61	0	0	7	4.67
Farmer	6	6.52	0	0	6	4.00
Labour	16	17.40	13	22.41	29	19.33
House wife	0	0	26	44.83	26	17.34
Employed (Service)	8	8.70	4	6.90	12	8.00

Unemployed	25	27.17	4	6.90	29	19.33
Retired from Job	3	3.26	0	0	3	2.00
Any other / Not known	5	5.43	1	1.72	6	4.00
Total	92	100.00	58	100.00	150	100.00

Table 9: Month wise incidence of Violent Asphyxial Death cases

Months	Male (n=92)		Female (n=58)		Total	
	No.	%	No.	%	No.	%
January	11	11.96	5	8.62	16	10.67
February	11	11.96	2	3.45	13	8.67
March	8	8.70	5	8.62	13	8.67
April	8	8.70	3	5.17	11	7.33
May	9	9.78	3	5.17	12	8.00
June	4	4.35	3	5.17	7	4.67
July	4	4.35	1	1.72	5	3.33
August	8	8.70	7	12.07	15	10.00
September	6	6.52	7	12.07	13	8.67
October	6	6.52	11	18.97	17	11.33
November	7	7.60	5	8.62	12	8.00
December	10	10.87	6	10.34	16	10.67
Total	92	100.00	58	100.00	150	100.00

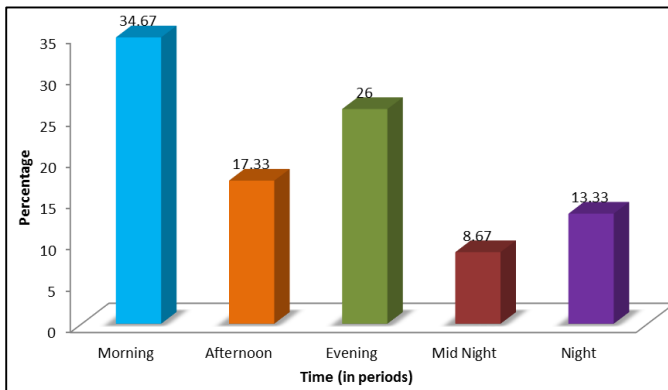


Fig 4: Incidence of Violent Asphyxial Deaths on different parts of day

Table 10: Precipitating factors as observed in suicidal death cases

Factors	Frequency	Percentage (%)
Poverty	11	9.40
Loss of service	4	3.42
Unemployment	26	22.22
Failure of love	14	11.97
Failure of Business	3	2.56
Failure of examination	19	16.24
Mental depression	16	13.68
Family Quarrel	15	12.82
Any other	9	7.69
Total	117	100.00

Figure 1 shows Incidence of violent asphyxial death in our study was 5%, the total number of autopsies conducted during the study period was 2976, out of which 150 were mechanical asphyxial death.

Table no 1 shows Gender wise distribution: Male victims were 92 (61.33%) while female victims 58 (38.67%); there was no case of transgender. Male and female victims were in the ratio of 1.58:1.

Table no 2 shows Gender wise sex distribution- The study cases were distributed on the basis of their age and gender. 60 (40.0%) subjects belonged to age group 21-30 years were commonest to be found where, females and males were 24 (41.4%) and 36 (39.13%) respectively. This was followed by 28 (18.7%) subjects in 30-40 age groups with 11 (18.97%)

females and 17 (18.48%) males. Two subjects were observed to be under 10 years of age.

Table no 3 shows Habitat wise distribution -Distribution of cases of violent asphyxial deaths on the basis of community habitat was observed. Maximum subjects that is 60 (40.0%) belonged to urban community which was followed by 43 (28.67%) and 41 (27.3%) were rural and suburban community respectively. The community habitat of 6(4.0%) subjects was not known.

Figure 2 shows Religion wise distribution- Violent asphyxial death incidence is more common in Hindus 131(87.34%), followed by Muslims 11(7.3%), Christians 2(1.3%) and 6 (4%) cases were of unknown religion.

Table no 4 shows Marital Status- The study subjects were distributed according to their marital status and their gender. 39 (67.2%) females and 50 (54.3%) males were married, 18 (31.04%) females and 37 (40.21%) males were unmarried while, and the marital status of 1 (1.7%) female subjects and 5 (5.4%) male subjects was unknown 55.

Figure 3 shows Socio-economic status- Majority of victims were from middle class 81 in number (54%) victims followed by lower class 49 in number (32.67%) victims, very low class 8 in number (5.33%) & upper and affluent class 6 in number (4.0%) and there were 6 in number (4.0%) victims with unknown background.

Table no 5 shows Manner of Death - The cases were distributed on the basis of nature of their death. Suicidal deaths was commonest to be observed 117 (78.0%) subjects which was followed by 23 (15.33%) accidental and 10 (6.67%) homicidal.

Table no 6 shows Type of death- The cases were distributed on the basis of their type of death. Hanging was commonest in 86 (57.3%) subjects followed by drowning in 36 (24.0%) subjects. 18 (12.0%) died of traumatic asphyxia while for smothering 1 (0.67%) and for throttling 2 (1.33%) cases was reported.

Table no 7 shows Gender wise distribution of educational status- Educational status of victims of violent asphyxia deaths in male and female was analysed. 37 (24.66%) cases had done their higher secondary education where, 25 (27.17%) were males and 12 (20.70%) were females. 28 (20.0%) were graduate with 21 (22.87%) males and 7 (12.07%) females. 28 subjects with 13 (22.4%) females and 15 (16.3%) males had their high school certification. Out of all the observed cases, 25 subjects were illiterate.

Table no 8 shows Occupational status of victims-Occupational status of victims of violent asphyxia deaths in males and females was analyzed. Out of all the 150 asphyxial deaths, 32 (21.33%) were students with 22 (23.91%) males and 10 (17.24%) females. 29 (19.3%) were unemployed with 25 (27.17%) males and 4 (6.9%) females.

Table no 9 shows Month-wise incidence -Majority (17) of the cases were found to be in the month of December & all around the year asphyxial death cases were more or less similar in all month except in month of July (5) deaths which was found to be least.

Figure 4 shows Incidence of Violent Asphyxial Deaths on different parts of day. The cases were analyzed on the basis of their period of death. Maximum deaths occurred in a morning

with 52 cases comprising 34.67% of the study subjects. This was followed by deaths in the evening and afternoon with 39 (26.0%) and 26 (17.3%) subjects respectively. 20 (13.3%) and 13 (8.67%) subjects each reported deaths in the night and midnight.

Table no 10 shows Precipitating Factors in suicidal deaths - Precipitation factors in suicidal deaths were observed. Unemployment was commonest in 26 (22.22%) subjects followed by failure of examination in 19 (16.24%) subjects. Factor of death in 16 (13.68%) cases was mental depression.

Discussion

An increasing death rate as a result of violence constitutes a large group in violence constitutes a large group in medico-legal autopsies especially death due to asphyxia are one of the most important cause in violent deaths.

Figure 1: indicates the incidences of violent asphyxial death in our study was 5%, the total number of autopsies conducted during the study period were 2976, out of which 150 were mechanical asphyxial death. Similar observations were reported by Sharma *et al.* [8] (5%), Amandeep *et al.* [9] (5.26%), Patel Ankur *et al.* [10] (5.63%), Mariam Arif [11] (5.9%), Tirmizi SZ *et al.* [12] (7.08%), Murty OP *et al.* [13], (10%) and Ajay Kumar S *et al.* [14] (10.50%). But in studies done by Reddy SP *et al.* [15], and Azmac D *et al.* [16], the incidences were 19.15% and 15.7% respectively.

Table No.1: Data compiled in this table includes in our study, Gender –wise distribution as male victims were 92 (61.33%) while female victims 58 (38.67%); there was no case of transgender. Male and female victims were in the ratio of 1.58:1. Similar findings were observed in the study done by P Ankur *et al.* [10]. Males are most common victims with male: female ratio is 1.69:1. Reddy SP *et al.* [15], (Males: 59.14% & and females: 40.86 %), Chaurasia N *et al.* [17], (Males, 60.89% & and females: 39.11 %), D K Vadgama *et al.* [18] (Males 64% & Females 36%) and Ahmed *et al.* [19] (Males 61.9% & Females 38.1%).

Table No. 2: This table includes the incidences of violent asphyxial death was highest among the age group 21-30 years, 60 (40%) victims of 36 cases were male, 24 cases were female and least in age group 81-90 years (1.33%). The findings of the present study were similar to the study of Sharma *et al.* [8], (57%), Ajay Kumar S *et al.* [14], (38.89%), of Ghadge *et al.* [20], (37.9%), Arif *et al.* [11], (37.6%), Chaurasia N *et al.* [17], (35.79%), Reddy SP *et al.* [15], (34.93%) and Patel Ankur P *et al.* [10], 6 (32.99%), and, Arora S [21] (32.59%) Teenage and adulthood are the most active phases of life wherein exposure to anxiety, stress, strain and various adverse circumstances occur. Economic problems, unemployment, failure in love, alcohol addiction, and emotional instability were the alleged reasons for committing suicide in this age group.

Table No. 3: This table highlights the incidence of violent asphyxial death was more common in urban area 60 (40.0%) than rural and suburban area in which incidence rate were 43 (28.67%) and 41 (27.33%) respectively. The findings of the present study similar with the study of Chauhan BS *et al.* [22] (Urban 70.2%, Suburban 19.85% & Rural 9.89%) Rawat VE *et al.* [23] (Urban 72.28% & Rural 27.72%), some another study rural population was more incidence rate Singh A *et al.* [24], (Rural 51.6% & Urban 48.4%), Santhosh C.S *et al.* [25], (Rural 51.14% & Urban 44.86%) and Gupta VP *et al.* [26] (Rural 43.75% & Urban 41,56%).

Figure No. 2: This figure depicts the violent asphyxial death

incidence is more common in Hindus 131(87.34%), followed by Muslims 11(7.3%), Christians 2(1.3%) and 6 (4%) cases were of unknown religion. Similar observations were reported by Sharma R. *et al.* [8], large majority of the respondents were Hindus 89.6%. Gupta V P *et al.* [26] (Hindus 87.19%, Muslims 10.94%, Christian 1.87%), Santhosh C.S, *et al.* [25] (Hindus 94.05%, Muslims 5.40%, Christians 0.54%) and Mohanty S.*et al.* [27], the victims were mostly Hindus (93.5%) by religion.

Table No. 4 (Marital status): Present table represents the study about incidences of violent asphyxial death was more common in married 89 (59.33%) as compared to unmarried 55 (36.67%) and 6 (4%) cases were of unknown marital status. These findings were similar to the study by Ajay Kumar S *et al.* [14], married person (63.9%) more often become victim compared to unmarried (36.1%). Waghmare PB *et al.* [28] married 68.33% & unmarried 25%, Ahmad *et al.* [19] 51 (57.3%) cases were married and 38 (42.7%) victims were unmarried.

Figure No. 3: It shows the Socio-economic status of Majority of victims were from middle class 81 in number (54%) victims followed by lower class 49 in number (32.67%) victims, very low class 8 in number (5.33%) & upper and affluent class 6 in number (4.0%) and there were 6 in number (4.0%) victims with unknown background. These findings were similar to study by Ahmed *et al.* [19], 55% cases belonged to middle socioeconomic class followed by 31.5% victims belonging to lower economic status. Rahman M.M. *et al.*, (2013) [29] upper class 12%, middle class 25%, lower class 62%.

Table No. 5: This table comprises the data about Manner of deaths in our study, the most common manner of death was suicidal 117 (78.0%) cases in number, followed by accidental 23 (15.33%) and homicidal 10 (6.67%) cases in number. The results of present study was similar with the findings of Patel A P *et al.* [10] and Ahmed *et al.* [19].

Table No. 6: Present table includes the data of the incidences of various types of violent asphyxial deaths was recorded and, out of 150 asphyxial death cases, hanging was found to be the commonest of all, 86 cases (57.3%), followed by drowning 36 (24.0%), strangulation 7(4.67%), throttling 2(1.33%), smothering 1 (0.67%) respectively and accidental finding of relatively higher proportion of traumatic asphyxia, 18 (12%) number of cases. Similar findings were observed in hanging deaths the study done by Sharma *et al.* [8] (69%), Reddy SP *et al.* [15] (61.19%) and Chaurasia N *et al.* [17] (52.21%), Tirmizi SZ *et al.* [12] (36.48%) and Patel Ankur P *et al.* [10] (82.48%).

Drowning deaths (24%) in our study differed in incidence when compared to other studies done by Tirmizi SZ *et al.* [12] (32.43%), Patel Ankur P *et al.* [10] (14.43%), and Sharma *et al.* [8] (11%).

Strangulation deaths (4.67%) in our study, similar findings were observed in the study done by Reddy SP *et al.* [15] (4.31%), Patel Ankur P *et al.* [10] (3.09%) and Chaurasia N *et al.* [17] (2.21%).

Table No. 7: It includes the data collected from the study of about 37 (24.66%) cases had done their higher secondary education where, 25 (27.17%) were males and 12 (20.70%) were females. 28 (20.0%) were graduate with 21 (22.87%) males and 7 (12.07%) females. 28 subjects with 13 (22.4%) females and 15 (16.3%) males had up to high school education. Out of all the observed cases, 25 subjects were illiterate. Similar findings were observed in the study by Ahmed *et al.* [19] majority, i.e., 24 (26.9%) of the victims was under-metric, followed by 20 (22.5%) illiterate cases. Victims

who did their graduation or higher studies were the least affected group, i.e., seven (7.9%). This differs from the study of Pathak NM^[30] who found maximum number of cases among victims with educational level up to high school standard. In a study by Rawat and Rodrigues^[34] 30.69%, Udhayabanu *et al.*^[31] 45.80% and Mohanty *et al.*^[27] 34.46% victims were from illiterate group. While Muninarayana *et al.*^[32] reported 87.6% cases from literate group and 12.4% from illiterate group

Table No. 8: This table highlights the data in our study, occupational status of highest number of victims, 32 (21.33%) were students, of which 22 (23.81%) were male and 10 (17.24%) victims were female, followed by unemployed 29 (19.33%) & least that is 3 (2.0%) were retired persons. The findings of present study are similar with the done by Majumder BC^[33] (students 25.8%, farmers 21.3%, & 11.3% cases were service holders), Gupta *et al.*^[26] (students 22.5%, daily labours 18.12%), and Rawat VEJ^[23] (unemployed 33.66%, farmers 15.84%).

Table No. 9: Present table comprises month wise distribution observed in our study, maximum (11.33%) number of the cases was found to be in the month of October and January (10.67%). All around the year asphyxial death cases were more or less similar in all months except in the month of July, 5 deaths occurred. The findings of the present study were similar to the study by Dhoble *et al.*^[34]. In India that the number of deaths increases in the winter season. However, Kumar *et al.*^[35], were of the view that maximum asphyxial deaths occurred in the summer months.

Figure no. 4: It shows that in our study, maximum deaths occurred in the morning with 52 cases comprising 34.67% of the studied cases. This was followed by deaths in the evening and afternoon with 39 (26.0%) and 26 (17.3%) cases respectively. These findings were similar to study by Waghmare P.B *et al.*^[28] (2014) show asphyxial death tendency more in morning 40%, followed by after noon 30%, evening 13%, night 11.66%, mid-night 5%. Tulapunt *et al.*^[36] time of death in most cases was during daytime between 06.00AM and 06.00PM (144 cases, 59%), followed by night time between 06.00 PM and 06.00AM (100 cases, 41%).

Table No. 10: This includes the data about the precipitating factors in suicidal death- In our study, unemployment was commonest in 26 (22.22%) subjects followed by failure of examination in 19 (16.24%) subjects. Factor of death in 16 (13.68%) cases was mental depression. The findings of present study are different from the study of Udhaya banu *et al.*^[31]. Noticed family disputes like marital disharmony and quarrel with spouse in 52.25% cases followed by mental illness in 23.87% cases. Marital disharmony/quarrel with spouse (29.96%) was the main cause behind hanging in a study by Ahmad *et al.*^[19] Rajesh Rai^[37] (2010) around 40% suicidal deaths were found involved with marital conflicts and frustration in love indicated interpersonal relationship as major stress present in the modern society. Srivastava (1984)^[38] had observed marital unhappiness and family quarrel along with poverty and un-employment as equally associated in approximately 1/4th (23.33%) cases, followed by chronic illness and mental depression in (13.33%)

Conclusion

Medico-legal autopsies provide an important statistical data related to legal incidents of that particular region. The violence in the form of asphyxia is also contributing to the increased number of deaths in this world (about 10% overall)

and in our context it was the fourth most common cause of unnatural death after Road Traffic Accident, burn and poisoning.

According to NCRB statistics (2014), distribution of suicide by means of hanging was 41.8%, by drowning was 5.6% out of all suicide cases reported all over India. At the same time, NCRB statistics (2014) also showed that in Uttar Pradesh hanging as a means of suicide, accounted for 1585 cases out of 53026 cases all over India while drowning accounted for 162 cases out of total 7401 cases. In our study, suicide by means of hanging was 57.33% while by drowning was 24% out of all Asphyxial deaths.

Suicide is a major public health issue of the world especially in developing countries. Attempt to commit suicide; under section 309 of IPC *viz* shooting, hanging and stabbing are a 'hard' way of committing suicide and typically a male choice; poisoning and drowning are 'soft' ways of committing suicide opted by females.

1. Previously there was punishment for attempt to suicide which was imprisonment which may extend to one year, with or without fine. Now according to Mental Health Act, 2017, Chapter XVI, Section 115, notwithstanding anything contained in Section 309 of the Indian penal Code any person who attempts to commit suicide shall be presumed, unless proved otherwise, to have severe stress and shall not be tried and punished under the said Code.

Now the study concludes that, Hanging and Drowning are one of the commonest methods for committing suicides (under Section 309 IPC) and (under Section 306 of IPC) abetment of suicide, are preferred methods for committing/attempting suicide after Poisoning and Thermal burn. Strangulation with or without ligature as well as Throttling (manual strangulation) is quite a common method of homicide after firearm and stab wound, in our place as well as in our country.

References

1. Nandy A. Principles of Forensic Medicine, 1st edition, New Central Book Agency (P) Limited, 1995, 142.
2. Dimaio VJ, Dmaio D. Forensic Pathology, 2nd ed. Washington, DC: CRC Press, 2001.
3. Reddy KSN. The essentials of Forensic Medicine & Toxicology, 19th edition, 2000, 283-295.
4. Parikh CK. Asphyxial death. In: Parikh CK's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology. 8thed. New Delhi; CB Sublishers; 2005; 3:47.
5. Brundtland GH. From WHO reducing risks to health, promoting healthy life, JAMA. 2002; 288(16):1974.
6. Peden MM, Mc Gee K. The epidemiology of drowning. Worldwide. Inj Control Saf Promot. 2003; 10(4):195-9.
7. Richards CE, Wallis DN. Asphyxiation: a review. Trauma 2005;7:37-45.
8. Sharma BR, Harish D, Sharma A, Sharma S, Singh H. Injuries to neck structures in deaths due to constriction of neck, with a special reference to hanging. J Forensic Leg Med. 2008; 15:298-305.
9. Singh Amandeep. A study of demographic variables of violent asphyxial death: Journal of Punjab Academy of Forensic Medicine and Toxicology. 2003; 3:32-34.
10. Patel-Ankur P, Bhoot-Rajesh R, Patel-Dhaval J, PatelKhushbu A. Study of Violent Asphyxial Death. International Journal of Medical Toxicology and Forensic Medicine.2013; 3(2):48-57.

11. Arif M. Ligature mark on the neck; How elucidative? *Professional Med J.* 2015; 22:798-803.
12. Trimizi SZ, Mirza FH, Paryar HA. Medicolegal investigation of violent asphyxial deaths – an autopsy-based study. *J Dow Uni Health Sci.* 2012; 6:86-90.
13. Murty OP, Agnihotri AK. Homicidal Deaths in South Delhi. *J. Ind. Acad. Forensic Med.* 2000; 22:9-11.
14. Ajay Kumar S, Chandan V, Rudresh YC, Govindaraju HC, Gouda S. Study of violent asphyxial deaths in Chitradurga district of Karnataka *IJBAR.* 2013; 4(12):868-871.
15. Reddy SP, Kumar R, Rudramurthy. Asphyxial deaths at district hospital, Tumkur a retrospective study. *J. Indian Acad Forensic Med.* 2012; 34(2):146-147.
16. Azmak D. Asphyxial deaths: a retrospective study and review of the literature. *AM J Forensic Med Pathol.* 2006; (2):134-144.
17. Chaurasia N, Pandey SK, Mishra A. An Epidemiological Study of Violent Asphyxial Death in Varanasi Region (India) a Killing Tool. *J Forensic Res.* 2012; 3(10.6):174.
18. DK Vadgama, PJ Manvar, PR Varu, RD Vaghela, RK Mashru. Study of asphyxial deaths in Rajkot Region. *Indian Journal of Forensic and Community Medicine,* October-December 2016; 3(4):254-256.
19. Ahmad M, Rahman FN, Hussain MA, Chowdhury MH, Yasmeen BHN. A medico-legal study of hanging cases at Dhaka Medical College. *IMCH J.* 2015; 7(1):110- 114.
20. Ghadge MR, Samel DR, Kulkarni DV, Pate R. Sociodemographic factors in mechanical asphyxial deaths in Thane region, Maharashtra, India. *Int. J Res Med Sci.* 2016; 4:4078-83.
21. Arora S. Profile of unnatural female deaths in Jammu region – an autopsy based study. *IJFMT.* 2016; 10:25-9.
22. Chauhan S. Suicide cases surge 45% in 3 years in HP. *Hindustan Times,* Shimla, 2015.
23. Rawat V, Rodrigues EJ. Medico-legal study of hanging cases in north Goa. *Int. J Forensic Sci. Pathol.* 2015; 3(5):110-118.
24. Singh A, Gorea RK, Dalal JS, Thind AS. A study of demographic variables of violent asphyxial death. *25 JPFMAT,* 2003, 3 Print ISSN-0927 – 5687
25. Santosh CS, Nawaz B. Pattern of suicidal deaths at district hospital Davangere a cross-sectional study. *J Indian Acad. Med.* 2013; 35(3):233-235.
26. Gupta Ved Prakash, Mahanta P. A Study of Asphyxial Death Cases in Medico-Legal Autopsy. *IJHRMLP,* 2016; 02(2):86-89.
27. Mohanty S, Sethi A, Patnaik KK, Mishra A. Socioeconomic demographic study of suicide among the people in Southern town Berhampur of Odisha State (India). *Austin J Forensic Science Criminol.* 2014; 1(2):1-6.
28. Waghmare PB, Chikhalkar BG, Nndandkar SD. Analysis of Asphyxial death due to hanging *J Indian Acad Forensic Med* Oct- Dec. 2014; 3(6):4.
29. Rahman MM, Md. Rezaul Haque, Polash Kumar Bose. Violent Asphyxial Death: A Study in Dinajpur Medical College, Dinajpur. *J Enam. Med Col.* 2013; 3(2):91-93.
30. Pathak NM. Study of histomorphological changes of lungs in cases of asphyxial deaths in medico-legal autopsy (Thesis submitted to the Gauhati University for the degree of Doctor of Medicine of Forensic Medicine), 2008.
31. Udhayabanu R, Toshi S, Baskar R. Study of hanging cases in Pondicherry region. *IOSR- JDMS.* 2015; 4(7):41-44.
32. Muninarayana C, Anil NS, Kamath P, Reddy M, Ravi Shankar S. A study of attempted suicides in Kolar, Karnataka. *Int J Health Sci Res.* 2013; 3(9):35-39.
33. Majumder BC. Study of Violent asphyxia deaths. *JIAFM.* 2002; 24(2):8–10.
34. Dhoble SV, Dhoble SS, Kukde HG. Socio-demographic profile of asphyxial deaths in females: 2-year study. *IJSR* 2016; 2:51-4.
35. Kumar C, Rana N, Goyal AK, Tanna J, Pathak A, et. al., Epidemiology of cases of hanging at Vadodara, Gujarat. *IRPMS.* 2015, 1(2).
36. Nattapong Tulapunt, Swarin Phanchan, Vichan Peonim. Hanging Fatalities in Central Bangkok, Thailand a 13-Year Retrospective Study, *Clinical Medicine Insights: Pathology,* 2017, 1-10.
37. Rajesh Kumar Rai, Tripathi SK, Manoj Kumar. A study of violent asphyxial death case, MD thesis. Dept. of Forensic medicine, IMS, Banaras Hindu University, Varanasi, 2010.
38. Srivastava AK. Study of violent asphyxial deaths in medico-legal autopsies, MD thesis, Dept. of Forensic medicine, IMS, Banaras Hindu University, Varanasi, 1984.