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A medicolegal study of death due to strangulation in Varanasi region

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Abstract
The incidence of strangulation cases differs as per the variation in the community, geographical location and socio-economic condition etc in all over the world. The present study is done here, in the view to gain further knowledge and insight in to epidemiological and medicolegal trend of asphyxia death due to strangulation to help in the process of crime investigation and administration of court of justice. Strangulation occupies less than 1% of all the medico legal deaths and 5-10% of criminally violent deaths. Incidence of violent asphyxia death due to strangulation done between the duration of 1st January 2016 to 30th June 2017. 11 Cases for the present study were selected from dead bodies brought to the department of forensic medicine, institute of medical sciences, Varanasi for medico legal autopsy examination. In my study death due to strangulation constitutes 3.69% of total deaths due to asphyxia. Fracture of hyoid bone mostly occurred in death due to strangulation (54.54%) cases with respect to all type of asphyxia deaths.

Keywords: Autopsy, asphyxia, strangulation, court of justice

Introduction
Asphyxia, etymological meaning i.e. without heart beat or pulselessness; Bichat (1771–1802) describes modes of deaths – coma, syncope & asphyxia i.e. Cessation of functions of CNS, CVS, & Respiratory System. The incidence of strangulation cases differs as per the variation in the community, geographical location and socio-economic condition etc in all over the world. Strangulation occupies less than 1% of all the medico legal deaths and 5-10% of criminally violent deaths (Srivastava, 1984) [1]. Singh *et al*. (2006) [2] reported that incidence of strangulation and hanging were 42% and 51% respectively of total asphyxia death in the North-west region of Punjab in his study [2]. Verma and Lal (2006) [3] reported that strangulation constitutes (1.17%) cases of out of 8385 Forensic autopsies cases in East Delhi (India) [3]. Sharma *et al*. (2007) in a 10 year retrospective study on unnatural deaths in northern India (Chandigarh) that strangulation constitutes 0.6% of all unnatural [4]. Ligature strangulation is reported as the more frequently recorded method of asphyxial homicide in urban South Africa (Suffla *et al*. 2008) [5]. Study of Violent Asphyxial Death by Patel-Ankur P*at* GMERS Medical College, Dharpur-Patan Gujarat, India in between December 2008 to November 2010 (2 years) found that Incidence of violent asphyxial deaths is 5.63% of total 388 autopsies in which strangulation are (03.09%) [6].
The mechanisms of death in strangulation include airway occlusion, resulting in hypoxia; occlusion of the neck vessels or compression of the carotid arteries, leading to cerebral ischemia; and carotid sinus reflex, leading to cardiac arrest.

Material and Method
Incidences of violent asphyxial deaths due to strangulation done between the duration of 1st January 2016 to 30th June 2017. 11 Cases for the present study were selected from dead bodies brought to the department of forensic medicine, institute of medical sciences, Varanasi for medico legal autopsy examination, from the various police stations of Varanasi district.

Discussion
Among all type of asphysial deaths, percentages of death are least due to strangulation. In my study death due to strangulation constitutes 3.69% of total cases *Patel-Ankur P* GMERS Medical College, Dharpur-Patan Gujarat, India found (03.09%) cases similar to my study but accrding to Singh *et al*. (2006) [2] reported that incidence of strangulation were 42% cases contradict my study. Age and sex wise distribution of victims from table revealed that out of

11 cases of strangulation 6 (36.36%) cases were male victims and 5 (27.27%) cases of females with a male: female ratio of 1.2:1 respectively. 21-30 year is the most common age range of occurrence of strangulation in male, in case of female are >60 years. No victim of strangulation was found below 20 years of age. Rajesh Rai (2010) [8] found the age group of 21-25 year shows the peak occurrence in both sexes [8]. Similarly Srivastava(1984) [1] also observed peak incidence in the age group of 21 to 30 years among both the sexes[1].In my study almost all strangulation cases are homicidal in nature, Verma and Lal (2006) [3] found that 94.89% cases were homicidal in nature and remaining 5.11% was accidental in all strangulation deaths.

In my study the percentage of various external and internal injuries observed in neck region in case of strangulation. It is observed that ligature mark is continuous (81.81%) and at the thyroid cartilage (54.54%) in most cases followed by below the thyroid cartilage (18.18%) cases. It is observed that internally neck was ecchymosed in 90.90% of cases, Sternocleidomastoid muscle contusion in 81.81% of cases, laryngeal and tracheal contusion are found in 90.90% of cases, fracture of hyoid bone (54.54%), contusion and lacerated wound were also present in 81.81% of cases. Singh *et al.* (2006) [2] found that associated trauma was present in 94.5% cases of strangulation; out of which in 44.4% cases, head and neck region was predominantly involved [2]. Nayak & Patil (2005) [7] found that Hyoid Bone fracture is very common in both forms of manual and ligature strangulation [7]. In my study it was found that ligature was used to ligate the victim's neck in 90% (10) cases while throttling was found in 10% (1) case only. Study by Rajesh Rai (2010) [8] ligature was used to ligate the victims in 73% (8) cases while 27% (3) were faced throttling [8].

Observation and Result

Table 1: Incidence of violent asphyxia death - (n =298)

Asphyxial death	Number of victim	percentage
hanging	137	45.97 %
strangulation	11	3.69%
drowning	129	43.28%
suffocation	21	7.04%

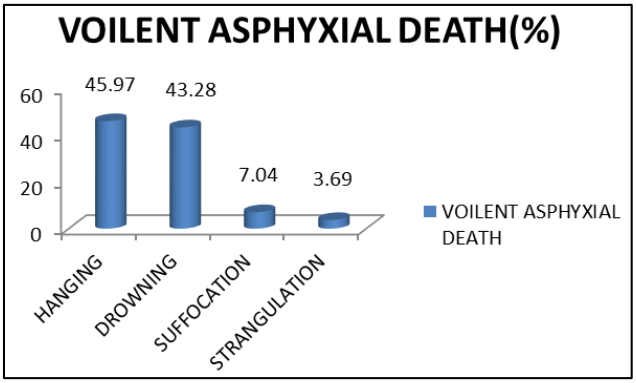

Fig 1

Table 2: Age and sex wise distribution of victims

Age(year)	Males		Females		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
0-20	0	0	0	0	0	0
21-30	3	27.27	1	9.09	4	36.36
31-40	2	18.18	1	9.09	3	27.27
41-50	1	9.09	0	0	1	9.09
51-60	0	0	1	9.09	1	9.09
>60	0	0	2	18.18	2	18.18
TOTAL	6	54.54	5	45.45	11	100

Table 2: Various feature of ligature mark

Feature	Number	Percentage %
Continuous	9	81.81
Above thyroid cartilage	1	9.09
At thyroid cartilage	6	54.54
Below thyroid cartilage	2	18.18
Not visible	1	9.09
Echymosis	10	90.90

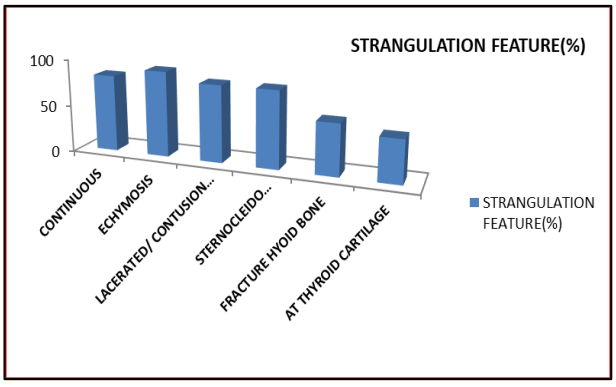

Fig 2

Conclusion

In our study among 298 cases of asphyxia deaths, majority of asphyxial deaths occurred due to hanging in 137 (45.97%) cases and strangulation in 11 (3.69%) cases. Out of 11 cases of strangulation, 6 (36.36%) cases were male victims and 5 (27.27%) cases of females with a male: female ratio of 1.2:1 respectively, all are homicidal in nature. 21-30 year is the most common age range of occurrence of strangulation in male. In our study it was observed that ligature mark is continuous in 81.81% of cases and at the level of Thyroid Cartilage in 54.54% of cases, fracture of Hyoid Bone noted in54.54% of cases, contusion and lacerated wound were also present in 81.81% of cases.

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