

## Study of violent asphyxial deaths in Rajkot Region

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### Abstract

**Background:** The violent deaths are increasing day by day in the developing world. Deaths due to asphyxia are one of the most important causes in the violent deaths. The study provides epidemiological analysis of autopsy record on violent asphyxial deaths.

**Material and Methods:** A Retrospective study of violent asphyxial deaths (100 cases) is carried out at Forensic Medicine Department of P. D. U. Government Medical College, Rajkot (Gujarat) during the period of January 2014 to March 2016.

**Results:** Drowning (52%) is the most commonly encountered violent asphyxia death. Males are most common victims. Most commonly involved age group is 21-30 years (28%), followed by age group 31-40 years (27%). Among the cases of Drowning, 48.07% cases were accidental and remaining 44.23% and 7.69% cases were suicidal and homicidal respectively. Most of the cases (35%) of hanging were suicidal. While 2 cases were of homicidal hanging. All the cases of Smothering (4%) and of strangulation (5%) were homicidal in nature.

**Keywords:** Mechanical asphyxial death, violent death, Strangulation, Hanging, Drowning, Smothering.

### Introduction

The term asphyxia is defined as “a condition caused by interference with respiration or due to lack of o<sub>2</sub> in respired air due to which the organs and tissues are deprived of o<sub>2</sub> (together with failure to eliminate co<sub>2</sub>), causing unconsciousness or death”. In mechanical asphyxia the body lacks of o<sub>2</sub> because of some violent mechanical interference with the process of breathing. So, they are also known as violent asphyxial deaths.<sup>(1)</sup> Violent asphyxial deaths include hanging, ligature and manual strangulation, smothering, traumatic asphyxia, suffocation, choking and drowning. The hanging and drowning are commonly seen in suicidal cases while strangulation including throttling is usually homicidal.<sup>(2)</sup> The present study is carried out with a view to study to incidence of different violent asphyxial deaths.

### Material and Methods

A Retrospective study of violent asphyxial deaths is carried out at Forensic Medicine Department of P. D. U. Government Medical College, Rajkot (Gujarat) during the January 2014 to March 2016. Total 100 cases were meticulously studied by considering various parameters like preliminaries of the deceased, history and place of incidence, post-mortem findings etc. The data was recorded in the Microsoft windows excel working sheets. The data collected was sorted out into categories based on sex, age, cause and manner of death, etc. The police inquest reports were used to collect the intent behind the act i.e. homicidal, suicidal or accidental.

### Results

A total of 450 medico legal autopsies conducted during the period from January 2014 to March 2016. Out of which 100 cases were due to violent asphyxial death, making the incidence rate 22.2%.

Table 1 shows age distribution of the subjects gender-wise. Of all the subjects autopsied for asphyxial deaths, males were 64% and females were 36%. Most of the reported asphyxial deaths belonged to age group 21-30 years making 28% of total deaths. Second largest age group was in the range of 31-40 years contributing 27% of the total deaths.

**Table 1**

Age Groups (year)	Male	Female	Total
<1	5	2	7
11-20	5	9	14
21-30	15	13	28
31-40	21	6	27
41-50	10	5	15
51-60	7	0	7
61-70	0	1	1
>70	1	0	1
Total	64	36	100

Table 2 shows the age and gender wise distribution of different asphyxial deaths. Among the asphyxial deaths, there were 64 males, and 36 females. Males were predominantly involved in all reported asphyxial deaths, except in ligature and manual strangulation.

Drowning and Hanging were the leading causes of violent asphyxial deaths contributing 52% and 37% respectively. Drowning and Hanging were common in males than in females (83.3% and 66 % respectively) whereas, strangulation was common in females (88.9%) than among males.

Hanging is common in age group 21-30 years (37.83%). Drowning and hanging were common in the age group of 21-40 years contributing to almost 48.07% cases and 70.27% cases respectively. 77.7% cases of strangulation were common in age group of 11-30 years.

Referring Table 2, if we consider the 55 deaths in age group 21-40 years, then 26(47.27%) death were due to hanging and 25(45.45%) death were due to drowning. Amongst the asphyxial deaths, most of the cases (50%) of smothering was noticed in young children indicating least resistance or struggle in this group of age.

Table 2

Age Group		<1	11-20	21-30	31-40	41-50	51-60	61-70	>70	Total
Hanging	Male	0	0	5	9	4	1	0	1	20
	Female	0	2	9	3	3	0	0	0	17
	Total	0	2	14	12	7	1	0	1	37
Ligature Strangulation	Male	0	0	1	0	0	0	0	0	1
	Female	1	1	0	0	0	0	0	0	2
	Total	1	1	1	0	0	0	0	0	3
Manual Strangulation	Male	0	0	0	0	0	0	0	0	0
	Female	0	0	0	2	0	0	0	0	2
	Total	0	0	0	2	0	0	0	0	2
Drowning	Male	3	3	9	12	6	6	0	0	39
	Female	1	6	3	1	2	0	0	0	13
	Total	4	9	12	13	8	6	0	0	52
Smothering	Male	2	0	0	0	0	0	0	0	2
	Female	0	0	1	0	0	0	1	0	2
	Total	2	0	1	0	0	0	1	0	4
Others	Male	0	2	0	0	0	0	0	0	2
	Female	0	0	0	0	0	0	0	0	0
	Total	0	2	0	0	0	0	0	0	2

Table 3 shows Manner of death in different asphyxial deaths. Most of the cases (94.59%) of hanging were suicidal. While 2 cases were of homicidal hanging. The proportion of females who committed suicide by hanging is significantly higher than those committed suicide by drowning. All the cases of Smothering (4%), Ligature (3%) and Manual strangulation (2%) were homicidal in nature. Among the cases of Drowning, 48.07% were accidental and remaining 44.23% and 7.69% cases were suicidal and homicidal respectively.

Table 3

	Suicidal			Homicidal			Accidental			Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Hanging	20	15	35	0	2	2	0	0	0	37
Ligature Strangulation	0	0	0	1	2	3	0	0	0	3
Manual Strangulation	0	0	0	0	2	2	0	0	0	2
Drowning	15	8	23	3	1	4	21	4	25	52
Smothering	0	0	0	2	2	4	0	0	0	4
Others	0	0	0	0	0	0	2	0	2	2
Total			58			15			27	100

## Discussion

Asphyxial deaths constitute an important proportion of medico legal deaths and will continue to do so due to stressful and competitive lifestyles.

In our study, Drowning was the commonest type of asphyxial death followed by hanging, which is consistent with the studies by authors,<sup>(3)</sup> but in other studies<sup>(4,5,6,7,8)</sup> it was observed that the incidence of Hanging being commonest (59.40%). According to WHO report 2000,<sup>(3)</sup> Both China and India have particularly high drowning mortality rates and together contribute 43% of

all drowning deaths worldwide. Most of the deaths caused due to drowning (nearly 97%) occur in developing countries like India, drowning is a common method of committing suicide especially amongst women, and more particularly in localities nearby the sea, river, dam or canal.

Among the asphyxial deaths, there were 64 males, and 36 females. Males were predominantly involved in all reported asphyxial deaths, except in ligature and manual strangulation. (Table 2). 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. Males being natural breadwinners of the family are expected to be outdoors most of the time and therefore more exposed to the dangers of violence and accidents.

Most of the reported asphyxial deaths belonged to age group 21-30 years making 28% of total deaths. This being the most active age group is most exposed to external violent factors. Second largest age group was in the range of 31-40 years contributing 27% of the total deaths.

It is considered that the manner of death in hanging is virtually always suicidal and in strangulation it is homicidal in nature. Uncommonly accidental hanging does occur. Homicidal hangings however are generally thought to be highly unusual. Despite some case reports of homicidal hangings, retrospective studies by Azmak<sup>(9)</sup> (Turkey) have demonstrated that homicidal hangings are virtually non-existent. But in our study, Most of the cases (94.59%) of hanging were suicidal. While 2 cases were of homicidal hanging. However, study by Gambhir Singh et al<sup>(10)</sup> has demonstrated homicidal hanging cases. Among the cases of Drowning, 48.07% were accidental, which is correlates with a study on epidemiology of drowning from Isfahan province of Iran, which has also reported 85.1% accidental drowning.<sup>(11)</sup> Amongst the asphyxial deaths, most of the cases (50%) of smothering was noticed in young children indicating least resistance or struggle in this group of age.

### Conclusion

Asphyxial deaths was accounted for 22.2% of the total studied Cases. The most common asphyxial death is drowning (52%) followed by hanging (37%). Males were more commonly involved than females. Most common involved age group is 21-40 years. Manner of death was found to be suicidal in 94.59% hanging cases and all strangulation cases were homicidal deaths.

This avoidable loss of valuable manpower causes big harm to India's social, cultural and economic stability and progress. Compilation of such primary data originating from the Post-mortem departments from various regions and different times could give us a deep insight into various trends and predisposing factors contributing to it, and as such help us in devising interventions to decrease the incidence of Mechanical Asphyxial Deaths in our community.

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