

**Autopsy Death Due to Strangulation in Palghar Region of Maharashtra**Umang Patel<sup>1</sup>, Amol Ghule<sup>2</sup><sup>1</sup>Associate professor, Department of Forensic Medicine and Toxicology, Vedanta Institute of Medical Sciences, Dhundalwadi, Dahanu, Palghar (Dist.)-410606, Maharashtra<sup>2</sup>Associate Professor, Department of General Medicine, Vedanta Institute of Medical Sciences, Dhundalwadi, Dahanu, Palghar (Dist.)-410606, Maharashtra

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**Abstract:****Background:** Strangulation are quite common in depressed and helpless and subjects when they does not find any solution for their problems. They submit themselves for suicide by strangulation which is an easy method or somebody might have killed by using any object which causes suffocation and ultimately to death due to wealth, health or jealousy.**Method:** In the study of medico-legal out of 1678 autopsies, 99 (5.9%) of death due to strangulation were selected for study.**Results:** The males were 70 (70.7%), and females were 29 (29.2%). The age group was between 11 years to 70 years. The highest percentage of death by strangulation between the age 21-30 years were 35.3%, followed by 11-20 years of age had 21.2%, 31-40 years of age group were 20.2%, and least percentage was observed (4%) in the age group between 51-60, and 61-70 years of age. Death percentage was highest in Rainy season 39.9%, followed by Summer 37.3%, and winter 23.2%, Urban area had maximum death 60.6% as compared to rural areas 39.3%, Indoor had 71.7%, and Outdoor had 28.2%. The site of ligature mark were highest above the level of Thyroid cartilage 73.7%, At the level of Thyroid cartilage were 19.9%, and least ligatures were below the Thyroid cartilage 7%. The significant findings in the dissection of neck in the deaths by strangulation were -- Hemorrhages in the strap muscles 24.2%, injury to neck muscles 8%, fracture of Hyoid bone 9%, injury to Thyroid cartilage 4%, tear of Carotid Artery 7%.**Conclusion:** This pragmatic study of death by strangulation will certainly help the medico-legal expert, police and judiciary officials to differentiate death from strangulation and Hanging.**Keywords:** Strangulation, Ligation, Dissection, Thyroid cartilage, Hyoid bone.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Death occurring due to strangulation is not uncommon cause in the present day. Suicidal manner is more common in strangulation deaths. The tendency towards suicidal strangulation is found to be higher because of easy availability of ligature material. Any long flexible or rigid material can be used for strangulation. Strangulation is that form of asphyxia which is caused by suspension of the body by ligature which encircles the neck, the constricting force being weight of the body [1]. Strangulation is one of the top five methods of choice for committing suicide; other preferred methods are poisoning, drowning, burning, and jumping from the tall structures [2]. Suicide by strangulation the second common method used as it causes sudden death with less pain. In strangulation where the point of suspension is over the center of occiput there are maximum possibilities of occlusion of arteries and this is

known as typical strangulation, while all other points of suspensions are called atypical strangulation [3]. Hence attempt was made to study the deaths due to strangulation at various age groups and at different seasons, because seasons also play vital role to cause depression. In depression there are variations in the neurotransmitters induced by seasonal and climatic variations.

**Material and Methods**

The study was done in department of Forensic medicine and Toxicology Vedanta Institute of Medical Sciences Palghar, Maharashtra- 410606. Out of 99, 70 were males and 20 were females, aged between 10 years to 71 years. Death by strangulation in all three seasons Rainy season 39, summer 37, winter 23. Urban death by strangulation were 60, while rural were 30. The indoor death by

strangulation were 71 and outdoor were 28. The site of ligature marks above the thyroid cartilage were 73, at the level of Thyroid cartilage were 19, below the thyroid cartilage were 07.

In the dissection of neck, the important findings were haemorrhage in strap muscles, injury to neck muscles, fracture of Hyoid bone, injury to Thyroid cartilage, tear of Carotid Artery was noted. Duration of study from July-2018 to June-2022.

**Statistical analysis:** The various regions of strangulations and seasons of strangulations, places were classified with percentage and statistical analysis was done in SPSS software. The ratio of male and females was 2:1.

### Observation and Results

**Table 1:** Study of death due to strangulation at different age groups - 11-20 years were 21 (21.2%), 21-30 years were 35 (35.3%), 31-40 years were 20 (20.2%), 41-50 were 14 (14.1%), 51-60 and 61- 70 years age group were 4 (4%) and above 70 years was only 1 (1%).

**Table 1: Study of death due to strangulation at different age groups with percentage (No of bodies: 99)**

| Age group (in years) | Total No. of Cases | Percentage (%) |
|----------------------|--------------------|----------------|
| 00-10                | 00                 | 00             |
| 11-20                | 21                 | 21.21          |
| 21-30                | 35                 | 35.35          |
| 31-40                | 20                 | 20.20          |
| 41-50                | 14                 | 14.14          |
| 51-60                | 04                 | 04.04          |
| 61-70                | 04                 | 04.04          |
| > 70                 | 01                 | 01.01          |

**Table 2: Study of death due to strangulation in different Seasons (No. of deaths 99)**

| Season | Total No. of Cases | Percentage (%) |
|--------|--------------------|----------------|
| Summer | 37                 | 37.37          |
| Rainy  | 39                 | 39.39          |
| Winter | 23                 | 23.23          |

**Table 3: Study of death due to strangulation in different residence or place (No of deaths 99)**

| Residence | Total No. of Cases | Percentage (%) |
|-----------|--------------------|----------------|
| Rural     | 39                 | 39.39          |
| Urban     | 60                 | 60.60          |

**Table 4: Study of death due to strangulation incidences at different places (No of bodies -99)**

| Place   | Total No. of Cases | Percentage (%) |
|---------|--------------------|----------------|
| Outdoor | 28                 | 28.28          |
| Indoor  | 71                 | 71.71          |

**Table 5: Study of different site of ligatures marks on the neck in the dead bodies of Strangled (No of bodies -99)**

| Site                                 | Total No. of Cases | Percentage (%) |
|--------------------------------------|--------------------|----------------|
| Above the level of thyroid cartilage | 73                 | 73.73          |
| At the level of thyroid cartilage    | 19                 | 19.19          |
| Below the level of thyroid cartilage | 07                 | 07.07          |

**Table 2:** Study of death by strangulation in different seasons- In Rainy 39 (39.3%), Summer 37 (37.3%), in winter 23 (23.2%).

**Table 3:** Study of death due to strangulation in different places - Urban death were 60 (60.6%), Rural 39 (39.9%).

**Table 4:** Study of death due to strangulation in different places of incidence .Indoor deaths were 71 (71.7%) and outdoor deaths were 28(28.2%).

**Table 5:** Study of different site of ligature on the neck of the hanged dead bodies (a) -Ligature above the thyroid cartilage 73 (73.7%), (b) -Ligature at the level of Thyroid cartilage 19 (19.1%), (C) - Ligature below the level of Thyroid cartilage 7 (7%)

**Table 6:** Study of significant findings in the dissections of neck of dead bodies by strangulation.(1) Hemorrhage in the strap muscles 24 (24.2%), (2) -Injury to neck muscles 8 (8%), (3) -Fracture of Hyoid bone 9 (9%), Injury to Thyroid cartilage 4 (4%). Tear of Carotid Artery 7 (7%).

**Table 6: Study of significant findings in the neck of dead bodies of strangulation during dissection (No of bodies -99)**

| Neck Dissection Findings     | Total No. of Cases | Percentage (%) |
|------------------------------|--------------------|----------------|
| Hemorrhages in strap muscles | 24                 | 24.24          |
| Injury to neck muscles       | 08                 | 08.08          |
| Fracture to hyoid Bone       | 09                 | 09.09          |
| Injury to thyroid Cartilage  | 04                 | 04.04          |
| Injury to cricoid cartilage  | 00                 | 00             |
| Carotid artery intimal tear  | 07                 | 07.07          |

### Discussion

Present study of death by strangulation in Maharashtra region. The age group of death by strangulation was 21-30 years, death were 35 (35.3%) followed by 11-20 years of age group had 21 (21.2%) and 31-40 age group had 20 (20.2%) (Table-1). These findings were more or less in agreement with previous studies [4,5]. It certainly indicates that, youth have surrendered to death through easy and painless method by strangulation because it is the age dreaming and struggling for their better future and most of them build castle in the air. when they got disappointed in personal, socio-economic life, they get disappoint and develop depression. They could not find any alternate way except suicide by easy and pain less method of strangulation. These findings were also more or less in agreement with previous studies [6,7]. It indicates that, males were more mentally ill than female's and ended their life in the state of anxiety and depression. It was also noted that, urban death by strangulation were higher (60-6%) than rural (39-3%). It again gives a thought that, rural people were leading satisfactory and compromised life than urban areas.

The urban youth and adult develop complexity by comparing themselves with other well to do or affluent personalities, their habit and habitat. This inferiority complex snatch away their sleep and compromised life which leads to anxiety, depression, addictions like alcoholic, smoking, drugs etc., ultimately lose their mental state and surrender to death by strangulation. Sometimes under the influence of alcohol they do the unforgivable crimes and to escape from punishment and bad name.

They end their life by easy and painless method death by strangulation. IT is also confirmed that, death by strangulation were highest in indoor (71-7%) and least in outdoor (28,2%) (Table-5). We're suffering with depressive illness, found more comfortable in loneliness because such patients develop paranoid reaction with hallucinations. It was observed that, death by strangulation was highest in Rainy season (39.3%), followed by summer (37.3%) and winter (23.2%) (Table no-3) The patients become more aggressive or manic in Rainy season because of excessive secretion of

neuro-transmitters like serotonin, adrenaline etc. due to fluctuating in climate especially in Rainy season In the present study Ligature above the Thyroid cartilage was highest (73.7%), and ligature at the level of Thyroid cartilage (19.9%). And below the Thyroid cartilage (7%). (Table-6) These findings were more or less in agreement with previous studies [8,9]. Ligature clearly indicates that, strangulation by external and above the cartilage ligation is due to strangulation by plastic rope or wire which skids or slips from elevation of Thyroid cartilage and ligation below the Thyroid cartilage was flat cotton material like Saree or Dupatta, which is fixed below or at the level of Thyroid cartilage.

During the dissection of neck of dead bodies of hanged 242% hemorrhage in strap muscles, 8-8% injuries to the neck muscles, 9% fracture of Hyoid bone, 4% injuries to thyroid cartilage 7% tear of Carotid artery (table-7). Findings of these data more or less in agreement with previous studies.[10] These significant findings of various injuries and fractures confirms that death by strangulation occurred during panic states moreover composition of ligature material, force applied on the neck and its duration along with body weight also play vital role for injury, fracture or breakage. Tear of Carotid artery could be due to hard fixed noose. Fracture of hyoid bone and injury to thyroid cartilage in complete strangulation under panic condition Strangulation deaths or any suicide is due to mental illness. India and China together account for one third of the global burden of mental illness, higher than the total number of developed countries and yet most people with mentally disorder do not receive treatment. Only 1 out of 10 mentally ill gets treatment in India [10] such type of mental illness include manic disorders, anxiety neurosis, etc. which ultimately end into suicide.

### Summary and Conclusion

The present study of death due to strangulation in Maharashtra region will certainly help the medico-legal expert to study the types of ligature, age, sex, significant findings during dissection of neck. Apart from this dribbling of Saliva, bleeding from the mouth and nose cyanosis, involuntary discharge of urine and fecal matter, semen on glans penis, per ligature injuries fracture of Hyoid bone, Thyroid

cartilage, Larynx and trachea in cases of strangulation and strangulation are non-specific and variable Depending upon the composition of ligature material force applied on the neck and its duration, injuries on other parts of the body will certainly differentiate from ligature from strangulation. This study further demands, study of mental illness or mindset of dead due to strangulation because highly ambitious or mega mania or mood disorders individual often choose the suicidal way instead of compromising moreover strangulations could be due to wealth and jealousy. Hence past history of mental illness and any grudge of past enmity also to be taken into consideration while differentiating strangulation from ligation this research paper is approved by the Ethical committee of Vedanta Institute of Medical Sciences Palghar, Maharashtra-410606.

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