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AN OBSERVATIONAL STUDY OF VIOLENT ASPHYXIAL DEATHS AND ITS MEDICO LEGAL ASPECT WITH ANCIENT AND MODERN PROSPECT

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ABSTRACT:

Violent asphyxial death is a common incident in forensic practices and it forms one of the modes of death which may be suicidal, homicidal or accidental in nature. In such deaths, a detailed and meticulous autopsy plays a major role to solve the case.

An observational study was conducted at Department of Forensic Medicine and Toxicology, Indira Gandhi Medical College and Hospital (IGMC),Nagpur. In the study, total 35 cases of violent asphyxial deaths were observed. Autopsy findings were studied according to both ancient and modern aspect. Violent Asphyxial Deaths can be viewed as *Kanthapeedan* (Hanging & Strangulation), *Dhoomopahat* (Suffocation) and *Udakahat* (Drowning) in ancient literature. In the study, most of the findings mentioned by ancient science were found to be early and late signs of death. Very few signs were specific of asphyxial death. Also Drowning and Hanging were found to be most commonly occurring among violent asphyxial deaths, 11-30 years was the vulnerable age group and males outnumbered females. The most frequent form of asphyxial death is drowning (45.71%), followed by hanging (34.28%), suffocation (11.43%) and strangulation (8.57%). Hanging is often suicidal in nature, Drowning is mostly accidental and suicidal, Strangulation is almost homicidal and Suffocation is mostly accidental. Suicide was found to be the manner of death in the majority of the cases.

Thus present article comprises of a prospective observational study of violent asphyxial deaths with ancient and modern prospect.

Keywords: Violent Asphyxial death, Hanging, Strangulation, Suffocation, Drowning, *Kanthapeedan, Dhoomopahat ,Udakahat*

INTRODUCTION:

Vyavahar Ayurveda is known as Medical Jurisprudence, Forensic Medicine or Legal Medicine in modern science [1]. It is the subject concerned with the application of medical and paramedical scientific knowledge to certain branches of law, both civil and criminal [2].Increasing number of unnatural and suspicious deaths in this present era generate intense need of Vyavahar Ayurveda.

Asphyxia is most commonly appearing as a major cause of unnatural deaths. Asphyxia is synonymous to hypoxia or anoxia.. However in forensic practice, the term asphyxia is used to describe a condition in which supply of oxygen to the blood and body tissues is reduced appreciably below the normal working level by any interference with respiration [3]. In violent asphyxial deaths, the process of respiration i.e. exchange of air between

the atmosphere and the lungs bed is prevented by some violent mechanical means. Violent asphyxia can be caused by constriction of neck, closure of nose and mouth, occlusion of lumen of the air passages by some materials, restricting movement of respiratory muscles. Violent Asphyxial Deaths are very common and occur through Hanging, Strangulation, Suffocation and Drowning. [4][5]. These may be accidental, suicidal or homicidal. Commonly hanging and drowning are suicidal while strangulation is usually homicidal and suffocation is almost accidental in nature.

Need of the study

As Acharya Sushrut mentioned, whatever is practically seen and whatever is known from scripture- that both combined together develops the knowledge further [6]. So to profound our knowledge, this observational study was carried out with a view to study post-mortem findings in different violent asphyxial deaths according to ancient and modern science. This may be beneficial for exploration of ancient science which is the need of hour.

Material and methods

- A standard proforma was prepared with expert guidance to study violent asphyxial deaths with practical study i.e. medico legal autopsy.
- The study was carried out at Dept. of Forensic Medicine and Toxicology, Indira Gandhi Medical College, Nagpur.
- Total 35 cases of violent asphyxial deaths were studied.

The following parameters were studied:

1. Most prominent method of violent asphyxial death.
2. Sex wise distribution.
3. Age wise distribution.
4. Manner of violent asphyxial death.
5. Postmortem findings according to both contemporary and ancient science.

Observation and Result

Total 35 cases of violent asphyxial death were studied in relation to the postmortem findings and manner of death.

Table 1: Incidence of different violent asphyxial deaths in total of 35 cases.

S.No.	Type of violent asphyxial deaths	No of cases (n=35)
1	Hanging	12 (34.28%)
2	Drowning	16 (45.71%)
3	Suffocation	4 (11.43%)
4	Strangulation	3 (8.57%)

Table 2: Sexwise distribution of total of 35 cases of violent asphyxial deaths.

Total no. of cases studied	Male	Female
35	27 (77.14%)	8 (22.86%)

Table 3: Age wise distribution of total of 35 cases of violent asphyxial deaths.

S.No	Age groups in years	No. of cases (n=35)
1	0-10	3 (8.57%)
2	11-20	8 (22.86%)
3	21-30	11 (31.43%)
4	31-40	5 (14.28%)
5	41-50	3 (8.57%)

6	51-60	3 (8.57%)
7	61-70	2 (5.71%)
8	71-80	0 (0%)
9	81-90	0 (0%)

Table 4: Distribution of different violent asphyxial deaths with respect to manner of death as per police in total of 35 cases

S.No.	Type of violent asphyxial deaths	Accidental	Suicidal	Homicidal	Not ascertained by police	Total
1	Hanging	0 (0%)	12 (100%)	0 (0%)	0 (0%)	12
2	Drowning	10 (62.5%)	5 (31.25%)	1 (6.25%)	0 (0%)	16
3	Strangulation	0 (0%)	0 (0%)	2 (66.67%)	1 (33.33%)	3
4	Suffocation	4 (100%)	0 (0%)	0 (0%)	0 (0%)	4

Table 5: Postmortem findings as per ancient [7-10] and modern science [11-16] in total of 12 cases of hanging

SN	Postmortem findings	No of cases (n=12)
1	Dribbling of saliva (*Lalastravam*)	9 (75%)
2	Ligature mark (*Savyanjankantham*)	12 (100%)
3	Froth at mouth and nostrils (*Fenagamanam*)	0 (0%)
4	Partially opened state of eyes (*Unmilita Aksha*)	8 (66.67%)
5	Purging of urine, faeces and semen (*Nishkirnamutrapurisham*)	4 (33.33%)
6	Cyanosis	6 (50%)
7	Glove and stock pattern of post mortem lividity	4 (33.33%)
8	Tongue clenched between teeth	9 (75%)
9	External petechial hemorrhages over conjunctiva, face and forehead	9 (75%)
10	Internal petechial hemorrhages under scalp, pericardium, lungs	12 (100%)
11	Dark fluid blood	12 (100%)
12	Fracture or dislocation of hyoid or thyroid cartilage	0 (0%)
13	*Vatapurnakoshthatwakkam* (organs are inflated with wind)	0 (0%)
14	*Shunapaneepadodaram* (oedema of hands, legs and abdomen)	0 (0%)
15	*Sankuchitabahusakthi*(flexed condition of both arms and thighs)	0 (0%)
16	*Apagat Aksha*(sunken eyes)	12 (100%)
17	*Udvrittanabhi*(inflated navel)	0 (0%)

Table 6: Postmortem findings as per ancient [7-10] and modern science [11-16] in total of 3 cases of strangulation

SN	Postmortem findings	No of cases (n=3)
1	Dribbling of saliva*(Lalastravam)*	0 (0%)
2	Ligature mark, horizontal , completely encircling the neck*(Savyanjankantham)*	3 (100%)
3	Bloody froth at mouth and nostrils*(Fenagamanam)*	3 (100%)
4	Partially opened state of eyes*(UnmilitaAksha)*	2 (66.67%)

5	Purging of urine,faeces and semen*(Nishkirnamutrapurisham)*	2 (66.67%)
6	Cyanosis	1 (33.33%)
7	Tongue clenched between teeth	2 (66.67%)
8	External petechial hemorrhages over conjunctiva, face and forehead	2 (66.67%)
9	Internal petechial hemorrhages under scalp, pericardium, lungs	3 (100%)
10	Dark fluid blood	3 (100%)
11	Fracture or dislocation of hyoid or thyroid cartilage	0 (0%)
12	*Vatapurnakoshthatwakkam* (organs are inflated with wind)	0 (0%)
13	*Shunapaneepadodaram*(oedema of hands, legs and abdomen)	0 (0%)

Table 7: Postmortem findings as per ancient [17] and modern science[11-16]in total of 16 cases of drowning

SN	Postmortem findings	No of cases (n=12)
1	Oozing of whitish or blood tinged, fine, tenacious froth from mouth and nostrils which increases on compression of chest	16 (100%)
2	Post mortem lividity over face, neck and front of trunk	2 (12.5%)
3	Cutis anserine	6 (37.5%)
4	Washerwoman's hands and feet	10 (62.5%)
5	Purging of urine,faeces and semen	8 (50%)
6	Cyanosis	4 (25%)
7	External petechial hemorrhages over conjunctiva	2 (12.5%)
8	Internal petechial hemorrhages under scalp, pericardium, lungs	16 (100%)
9	Presence of heavy, voluminous, oedematous, congested lungs and oozes copious froth on cut section	16 (100%)
10	Presence of water in the stomach	11 (68.75%)
11	*Nistabdhagudaksham*(protruded rectum and eyes)	0 (0%)
12	*Sandashtajivham*(tongue bitten between the teeth)	0 (0%)
13	*Udaradhman* (belly swollen)	0 (0%)

Table8: Postmortem findings in total of 4 cases of suffocation [11-16]

SN	Postmortem findings	No of cases (n=4)
1	Cyanosis	1 (25%)
2	Any oozing from mouth and nostrils	1 (25%)
3	Cherry red coloured post mortem lividity	3 (75%)
4	Partially opened state of eyes	3 (75%)
5	Purging of urine,faeces and semen	0 (0%)
6	External petechial hemorrhages over conjunctiva face.	0 (0%)
7	Internal petechial hemorrhages under scalp, pericardium, lungs	1 (25%)
8	Cherry red coloured lungs	3 (75%)
9	Bright cherry red blood	3 (75%)

DISCUSSION: Out of total 35 cases studied,12 cases (34.28%) were of hanging, 16 cases (45.71%)were of drowning, 3 cases (8.57%) were of strangulation and 4 cases (11.43%) were of suffocation. Majority of the cases of asphyxial deaths reported for autopsy were of drowning, followed by hanging.Thus, drowning and hanging are found to be the commonest type of violent asphyxial deaths. Frequency of suicides are increasing day by day and so drowning and hanging contributes major as they are mostly seen in suicidal cases.(Table: 1)

Out of total 35 cases, 27 (77.14%) were males and 8 (22.86%) were females. Thus, males outnumbered females. In this male dominant society, males are overexposed to stress and external environment as compared to females. So such cases are commonly seen in males. (Table: 2) Maximum number of cases i.e. 11(31.43%) were observed in age group 21-30 years followed by 8 (22.86%) which were observed in the age group 11-20 years. This shows vulnerability of the age group 11-20 years for violent asphyxial deaths. (Table: 3) The manner of death as per police inquest was studied in total of 35 cases. All 12 cases of hanging were found to be suicidal (100%).There was no case of accidental or homicidal hanging. Out of 16 cases of drowning studied, 10 cases (62.5%) were found to be accidental, 5 (31.25%) were found to be suicidal and only one case (6.25%) was found to be homicidal and the victim was a female infant. Out of 3 cases of strangulation, 2 cases (66.67%) were found to be homicidal and in one case police didn't ascertain the manner of death. Significantly any case of suicidal or accidental strangulation was not found. All 4 cases of suffocation were found to be accidental. Out of 4 cases, 3 cases were of suffocation due to inhalation of irrespirable gases and one case was of choking. Thus, hanging is the form of death mostly used for suicidal purpose, drowning is mostly accidental and suicidal, strangulation is almost homicidal and suffocation is almost accidental in nature. (Table: 4) Postmortem signs of asphyxial deaths were observed in total of 35 cases.In all 12 cases (100%) of hanging ligature mark (*Savyanjankantham*)was observed around the neck which was typical i.e. around the neck above the level of thyroid cartilage running obliquely upwards and backwards and deficient posteriorly. In all 3 cases (100%) of strangulation, the ligature mark was found horizontal, completely encircling the neck. Though presence of typical ligature mark is indicative of death due to hanging or strangulation, it is not diagnostic sign as it may be produced even after death. Therefore a thorough examination of ligature mark is essential to find out whether it is ante mortem or post mortem. Out of 12 cases of hanging, dribbling of saliva (*Lalastravam*) was found in 9 cases (75%). This is said to be diagnostic of ante mortem hanging. Thus, absence of dribbling of saliva in remaining cases of hanging doesn't exclude ante mortem hanging as the relatives may have wiped it out while recovering the body from hanging position. Bloody froth at mouth and nostrils (*Fenagamanam*) was observed in all cases (100%) of strangulation. Out of 12 cases of hanging, glove and stock pattern post mortem lividity was observed in 4 cases (33.13%) and in remaining cases it was present over back and buttocks except pressure points.

Thus, this finding is not pathognomonic of hanging and it only indicates that the body was in suspended position for a considerable period after death. Presence of post mortem lividity over back and buttocks in the remaining cases indicates that the body has been lying in supine position after recovering it from hanging position. Partially opened state of eyes (*Unmilita Aksha*) was observed in in 8 cases (66.67%) of hanging and 2 cases (66.67%) of strangulation which is a non-specific sign of asphyxial death. Tongue was found clenched between teeth in 9 cases (75%). Due to the pressure at the base of the tongue by ligature, tongue may protrude and get clenched between teeth due to rigor mortis. Sometimes tongue may not protrude. Therefore presence of this sign in every case of hanging is not essential. Petechial hemorrhages were taken into consideration both externally as well as internally. External petechial hemorrhages over conjunctiva, face and forehead were observed in 9 cases (75%) of hanging and in 2 cases (66.67%) of strangulation. Internal petechial hemorrhages under scalp, pericardium, lungs were observed in all the cases of hanging and strangulation (100%).

Thus inference can be drawn that internal petechial hemorrhages are more significant than that of external. Fracture or dislocation of hyoid or thyroid cartilage was not found in any case of hanging and strangulation. The hyoid or thyroid cartilage fracture present more commonly in the persons above the age of 40 years. In present study, all were below 40 years of age except 2 cases. This may be the reason of not getting this finding in studied cases. Also its absence in 2 cases above the age of 40 years denotes that though this sign is very important finding in hanging and strangulation, it is not compulsory to occur. Thus among postmortem signs of hanging, ligature mark and dribbling of saliva have some special importance and considered as diagnostic sign of hanging which are already mentioned in Ayurveda as *Lalastravam*and, *Savyanjankantham* respectively *Apagat Aksha* (sunken eyes) was observed in every case of hanging and strangulation. It is just an early sign of death occurring in the eyes and not specific sign of asphyxia. *Vatapurnakoshthatwakkam, Shunapaneepadodaram, Sankuchitabahusakthi, Udvrittanabhi* were not observed in any case. The putrefactive gases forming below the skin, in hollow viscera and eventually in solid viscera may give rise *Vatapurnakoshthatwakkam* i.e. inflation of organs due to wind, Udvrittanabhii.e.inflated navel may appears due to the pressure effect of putrefactive gases over the umbilicus. Thus these are delayed signs of death and not specific of hanging. *Shunapaneepadodaram* means oedema of hands, legs and abdomen which may be cumulative effect of asphyxia and prolong suspension. *Sankuchitabahusakthi* i.e. flexed condition of both arms and thighs may be found in the cases of partial hanging when bodies are recovered from the hanging position after appearance of rigor mortis. In this study, there was no case of putrefaction, prolong suspension and partial hanging. So these signs were not observed in any case.

In all 16 cases (100%) of drowning, oozing of whitish or blood tinged, fine, tenacious froth from mouth and nostrils which increases on compression of chest was found. Thus this is a significant sign of

drowning. In drowning, post mortem lividity generally present over face, neck and trunk as the body is floating in head down position and get fixed in 5-6 hrs. But if the body is removed from water before fixation of lividity, then such typical pattern may not be found. In this study such typical pattern in observed in 2 cases (12.5%) only an in remaining cases, it was observed over back and buttocks except pressure points. Thus this shows early recovery of bodies from water. Out of total of 16 cases of drowning, cutis anserina and washerwoman's hands and feet were observed in 6 cases (37.5%) and 10 cases (62.5%) respectively. These signs are not specific of drowning but are immersion artifacts only. External petechial hemorrhages over conjunctiva were observed in 2 cases (12.5%) and internal petechial hemorrhages under scalp, pericardium were observed in all the cases of drowning (100%). Internal petechial hemorrhages over lungs were not found. This may be due to leakage of water in the sub pleural space. This again emphasizes importance of internal petechial hemorrhages over external.

A heavy, voluminous, congested and oedematous lung which oozes copious amount of froth on cut section was observed in all the cases of drowning (100%). This is the diagnostic sign of death due to drowning.

Presence of water in the stomach was found in 11 cases (68.75%). But this is not specific sign, as water may percolate in the stomach after death also.Thus, oozing of whitish or blood tinged, fine, tenacious froth from mouth and nostrils which increases on compression of chest and heavy, voluminous, congested and oedematous lungs which oozes copious amount of froth on cut section are diagnostic signs of drowning.

Nistabdhagudaksham, *Sandashtajivham*, *Udaradhman* were not observed in any case. The ancient post-mortem findings of drowning are findings of decomposition. *Nistabdhagudaksham* i.e. protrusion of rectum and eyes may be due to the pressure effects of putrefactive gases. *Sandashtajivham* i.e. tongue bitten between teeth may be due to protrusion of tongue by the pressure effects of putrefactive gases and *Udaradhman* i.e. collection of gases in the abdomen may also be due to putrefaction. In modern science it can be seen that these signs are present in the decomposed bodies recovered from water. In this study no case of putrefaction has been reported.

Out of total of 4 cases of suffocation, 3 cases were of suffocation due to inhalation of irrespirable gases and one was of choking. In all cases of suffocation due to inhalation of irrespirable gases, cherry red coloured post mortem lividity, cherry red coloured lungs and bright cherry red blood were observed. Also internal petechial hemorrhages were not found and this may be due to cherry red appearances of the organs.There were no external findings observed in case of choking but mud particles were revealed in trachea during internal examination. Thus in case of choking, cause of death is revealed during autopsy.Purging of urine, faeces or semen (*Nishkirnamutrapurisham*) was observed in 14 cases (40%) out of total of 35 cases of violent asphyxia deaths. But this is non-specific sign and is observed in other types of death due to relaxation of sphincters. (Table: 5,6,7,8)

CONCLUSION: Drowning and Hanging are most commonly occurring among

violent asphyxial deaths.11-30 years is the vulnerable age group and males outnumbered females. Hangings are often suicidal in nature. Drownings are mostly accidental and suicidal in nature. Strangulations are almost homicidal in nature. Suffocations due to inhalation of irrespirable gases and Chokings are mostly accidental in nature. Internal as well as external petechial hemorrhages are significant sign of asphyxial deaths, internal being more confirmative. Ancient post-mortem findings of violent asphyxial deaths are only external signs. Most of which are early and late signs of death. Very few signs are specific of violent asphyxial death such as *Lalastravam* i.e. dribbling of saliva and *Savyanjankantham* i.e. ligature mark.

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