

Drowning Cases in Kasturba Hospital, M.G.I.M.S Sewagram, Wardha, Maharashtra

*Dr.P.N.Murkey, **Dr.V.G.Pawar, ***Dr.J.L. Borkar, ****Dr.K. Suken Singh
*****Dr.I.L. Khandekar, *****Dr.B.H. Tirpude

*Associate Professor, **, *** & ****P.G. Students, *****Assistant Professor, *****Professor & Head
Mahatma Gandhi Institute of Medical Sciences, Kasturba Health Society
Department of Forensic Medicine & Toxicology, Sewagram

Abstract

In this retrospective study, total 27 victims of drowning asphyxial deaths cases were studied during the period from January 2003 to December 2006, at Kasturba Hospital of MGIMS, Sevagram. All cases were brought dead from spot for postmortem examination. The incidence was much more common in the males at the age group of 20-29 years and 50 years and above. Accidental drowning was the more common and common place as well. Maximum cases of suicidal drowning was with the history of some kind of mental illness or some chronic disease, presence of mud, sand etc. in lower respiratory tract was a very important sign of drowning.

Key words

Drowning, Suicide, Accidental death.

Present Designation-

Introduction

Drowning death is one of the most important unnatural deaths encountered by autopsy surgeons. The incidence of drowning death are different from place to place, could be due to geographical influences. **World War II** stimulated research on drowning because of the risk of cold exposure for a larger number of seamen and airmen's. View of that time was that victim died from a lack of oxygen when plunged into water.

Near about 1,50,000 persons die from drowning each year around the world.

In 1997, The National Center for Health Statistics found drowning, second only to motor

Reprint requests: Dr.P.N.Murkey

Associate Professor

Department of Forensic Medicine & Toxicology
MGIMS, Sewagram, Wardha (Maharashtra)

vehicle collisions (MVCs) as the most common cause of injury and death in children aged 1 month to 14 years.

Defination

Is a form of asphyxia in which access of air to the lungs is prevented by submersion of body in water or other fluid medium.¹

Classification:-²

1. Typical or wet or primary drowning
2. A typical or Dry drowning
 - a) Immersion syndrome
 - b) Submersion of Unconsciousness
 - c) Near drowning (Secondary shock syndrome)

Typical or wet or primary drowning-

- * Obstruction of air passage and lungs by inhalation of fluid
- * Typical signs of drowning found in at autopsy

* Two types

A) Fresh water drowning

B) Salt water drowning

A) Fresh water drowning:

Large quantity of water → crosses the alveolar membrane into circulation → Hypervolaemia of red cells → hemolysis → liberation of potassium → anoxia, hypervolemia, potassium excess and sodium deficit → ventricular fibrillation → Death (4-5 minute).

B) Salt water drowning:

Marked hyper tonicity of inhaled water → loss of fluid from circulation in to lungs → pulmonary edema with hypovolaemia → circulatory shock

→ cardiac a systole → Death (8-12 minutes).

* **A typical Drowning**

A) **Dry Drowning**

As the water enters nasopharynx or larynx
→ Laryngeal spasm → Asphyxia → Death .

B) **Immersion Syndrome (Vaso-Vagal inhibition)**

- * Sudden impact with cold water
- * In experience person → Duck diving
- * Horizontal entry → Impact on epigastrium

C) **Submersion of Unconsciousness-**

- * Epileptic ,Hypertensive, Heart Disease, Drunken

D) **Near Drowning-**

Complication → Hypoxic → Encephalopathy
→ Fibrosing alveolitis.

External Appearance

Clothes are wet, soiled by mud, sand or weeds.

- Skin is cold, clammy and pale due to contraction of blood vessels.
- Face may or may not be cyanotic.
- Eyes are half opened or closed.
- Conjunctiva congested, pupils dilated.
- Postmortem lividity absent if body is in constant motion but if present then on head, neck and front of the chest, mainly on dependent parts.
- Due to muscular exhaustion rigor mortis develops.

* **Absolute signs are-**

- * a) fine froth at the nose and mouth
- * b) Presence of weeds, mud in the tightly clenched hand
- * c) Cutis anserina or goose skin
- * d) Hands and feet of the washer women.

Internal appearance

- a) Changes in the respiratory tract-
Ballooning of the lung or Emphysema aquosam.

b) Biochemical changes in the blood-

- I) Gettler's Test-
- c) Presence and character of water in stomach & intestine
- d) Presence of diatoms in tissues
- e) Evidences indicative of death due to drowning-
 - I) Hemorrhages in the middle ear.
 - ii) Hemorrhage in the temporal bone or Mastoid bones

Material and Methods

This study was carried out at Kasturba Hospital of M.G.I.M.S; Sevagram, Wardha during the period from January 2003 to December 2006. The material for this study comprised of all type of drowning cases admitted at Kasturba Hospital Sewagram and directly brought dead from the spot at mortuary for postmortem examination during this period, in the Dept. of Forensic Medicine and Toxicology. Total 27 suspected drowning cases were brought for the postmortem examination at Kasturba Hospital Sewagram. The history about name, age, sex, address, manner, economic status and others are taken from the relatives and police who brought the dead body for the postmortem examination.

Each case was followed from various epidemiological factors like age, sex, occupation, religion, education; socio-economic status etc. and the medico-legal aspects were gathered from various sources and postmortem features of cases were collected from the autopsy examination.

Observation

Total 27 victims of drowning were brought dead from the spot for postmortem examination. All finding carefully observed and tabulated for better understanding.

Table No: - 1 showing year-wise incidence of drowning cases

| Year | Cases |
|-------------|--------------|
| 2003 | 13 |
| 2004 | 8 |
| 2005 | 3 |
| 2006 | 3 |
| Total | 27 |

Out of the cases, more cases were reported from year 2003 and least number of cases was reported from year 2005-06 respectively.

Table No: - 2 showing sex- wise incidence of drowning cases.

| Sex | No. of cases | Percentage |
|------------|---------------------|-------------------|
| Male | 18 | 66.67 |
| Female | 09 | 33.33 |
| Total | 27 | 100.00 |

Out of 27 cases of drowning, 18(66.67%) cases were male and 9 (33.33%) cases were females, indicating the male predominance in drowning cases.

Table No: - 3 showing age and sex- wise distribution of drowning cases.

| Age group | Male (%) | Female (%) | Total (%) | M:F |
|------------------|-----------------|-------------------|------------------|------------|
| 0-9 yrs. | 2(11.1) | 0(0) | 2(0.07) | - |
| 10-19 yrs. | 3(16.6) | 1(11.1) | 3(0.11) | - |
| 20-29 yrs. | 6(33.3) | 2(22.2) | 10(37.03) | 3:1 |
| 30-39 yrs. | 3(16.6) | 1(11.1) | 4(14.81) | 3:1 |
| 40-49 yrs. | 2(11.1) | 1(11.1) | 2(7.40) | 2:1 |
| >50and above | 4(22.2) | 4(44.4) | 8(22.2) | 1:1 |
| Total | 18(100) | 9(100) | 27(100) | |

Out of 27 victims of drowning, maximum cases were observed in the age group of 20-29 years and 50 years and above age group, comprising 10 (37.03%) cases each.

Among 18 males victims, maximum observed in the age group of 20-29 years comprising

6(33.3%), followed by 50 and above years having 4(22.2%) cases.

Among 9 female victims, maximum 4(44.4%) cases were in the age group of 50 years and above, followed by 2(22.2%) cases in 20-29 years.

Table No: - 4 showing rural/urban incidence of drowning cases

| Rural/urban | Male | Female (%) | Total |
|------------------|-----------|------------|-----------|
| Rural | 15(83.33) | 6(66.67) | 21(77.78) |
| Urban/semi urban | 3(16.67) | 3(33.3) | 6(22.22) |
| Total | 18 | 9 | 27 |

Maximum drowning cases were from rural areas, comprising 21(77.78%) cases, whereas 6 cases were from urban/semi urban areas. Among, males, 15 (83.33%) cases were from

rural areas, 3(16.67%) cases were from urban areas. Among females, 6(66.67%) cases were from rural and 3 (33.3%) cases from urban areas.

Table No: - 5 showing economic status of drowning cases

| Economic status | No. of cases | Percentage |
|---------------------|--------------|------------|
| Low (<500Rs.) | 20 | 74.07% |
| Middle(500-1500Rs.) | 7 | 25.93% |
| Higher (>1500Rs.) | - | - |
| Total | 27 | 100.00% |

Out of 27 victims of drowning, maximum cases were in the lower socio-economic groups, comprising 20 (74.07%) and 7 (25.93%) cases

were in the middle socio-economic status. No victim from the higher socio-economic status.

Table No: - 6 showing manner of drowning cases.

| Manner | Male | Female | Total |
|------------|-----------|----------|------------|
| Accidental | 12(66.67) | 3(33.33) | 15(55.56%) |
| Suicidal | 6(33.33) | 6(66.67) | 12(44.44%) |
| Homicidal | - | - | - |
| Total | 18(100) | 9(100) | 27(100%) |

Among males, 12(66.67%) cases were accidental and 6 (33.33%) cases were from suicidal drowning. Among females, 3(33.33%)

cases were accidental and 6(66.67%) cases were from suicidal drowning.

Table No:- 7 showing the content of respiratory tract in drowning cases.

| Features | No. of cases | Percentage |
|-------------------------------------------|--------------|------------|
| Froth from nose only | 4 | (14.82) |
| Froth from nose and mouth | 5 | (18.51) |
| Mud, sand etc. in lower respiratory tract | 18 | (66.67) |

Among 27 cases of drowning, mud, sand etc. were present in the lower respiratory tract in 18(66.67%) cases, froth was found in the nose in the nose & mouth in 5(18.51%) cases and only in the nose in 4(14.82%) cases.

Discussion

Total 27 victims of drowning cases were studied during the period of study; all cases were brought dead from the spot for the postmortem examination, but this finding slightly different from study of Bennet A.T.³ from sought Carolina, observed that suicidal death drowning consist of 3.24% cases. Momanchand A. and others⁴ from Imphal also reported that drowning was the 34.50% cases.

The present study, observed that the incidence is much more common in males than females, 66.67% & 33.33% respectively. Similar findings were observed in study of Momanchand A. and others⁴ from Imphal and Avis A.P.⁵ from Canada. This could be due to more activeness of male's society and less carelessness in females.

In this study maximum incidence was seen in the age group of 20-29 years and 50 years and above age groups, comprising 37.03% cases each. This finding is slightly consistent with the finding of Avis A.P.⁵ from Canada who reported that 51-60 years age group people were the common victim of suicidal drowning. This

finding slightly different from the finding of Momanchand A. and others⁴ from Imphal, in which 11-30 years was the commonest age group of drowning cases.

In the present study, out of all drowning cases, accident drowning was more, in 55.56% cases followed by suicidal 44.44% cases. Accidental drowning was more common because in this region economy is mainly depends upon the agricultural products and their irrigation mainly done by water from the well, canals, ponds, rivers, These are not safely guarded places, so accidental drowning is more common due to fall into the water.

In this study, 66.67% cases of drowning, shows mud, sand etc. were present in lower respiratory tract; this finding is similar to finding of Momanchand A. and others⁴ from Imphal.

References

1. Narayan Reddy, The essentials of Forensic medicine and Toxicology, 26th edition, Page No.-320.
2. Krishan Vij; "Textbook of Forensic Medicine and Toxicology", 2nd edition, page No.264-288.
3. Benner AT, Collins AA; "Suicide- A 10 year retrospective study" Jr. forensic Science. 2000, Vol 45(6), Page no.1256-1258.
4. Momanchand A.Meera, Th Fimate L; "Violent asphyxial death in Imphal" Jr. Forensic Medicine, Vol.XV, No.1, Jan-Jun 1983.Page.no 1213-1216
5. Avis SP; "Suicidal drowning", Jr. forensic Science, JFSCA Vol.No.38, Nov.1993, Page. No. 1422-1426.