ORIGINAL RESEARCH PAPER

Forensic Medicine

AUTOPSY FINDINGS IN DROWNING DEATH: TWO YEARS RETROSPECTIVE STUDY AT DEPARTMENT OF FORENSIC MEDICINE, ASSAM MEDICAL COLLEGE & HOSPITAL, DIBRUGARH, ASSAM

KEY WORDS: Drowning, froth, Paultauf haemorrhage, rib markings

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ABSTRACT

Drowning is a major public health problem worldwide. The study was done to see various findings present in drowning cases brought to the mortuary for autopsy to observe different demographic and post-mortem changes. Data on drowning death at department of Forensic medicine, Assam medical College & hospital, Dibrugarh was collected in two years period from January 2018 to December 2019, compiled and analysed. Total number of death due to drowning was found to be 184 numbers (6.4%) out of total 2875 of all autopsies done. Maximum number of cases found in rainy season with open water sources. Timely and systematic prevention and precautions are utmost important for reducing such incidences.

INTRODUCTION:

In India drowning is a major cause of unnatural. Though drowning cases are usually found in open water sources like river, pond, lake etc., the process of urbanization also makes way for drowning incidences. In the process of drowning and post incident period till recovery of the body from water, various changes of the body and organs develops. The present study was conducted to evaluate the different autopsy findings in death due to drowning, along with different factors like age, sex, living standards, education of the victim and seasonal variations etc. with an aim to suggest and take remedial measures for prevention.

MATERIAL AND METHODS:

Present study was done in a retrospective manner the at department of Forensic medicine, Assam medical College & hospital, Dibrugarh, Assam for a period of two years from January 2018 to December 2019. A total of 2875 numbers of post-mortem examinations was done during these periods out of which 184 cases were found to be drowning death.

All drowning death cases were included in this study.

Documents and other informative materials supplied by police personals and accompanying persons along with various data from post-mortem findings were collected.

The collected information and findings were analysed and discussed elaborately and also compared with other studies.

RESULT & OBSERVATION:

Death due to drowning was found be 184 (6.4 %) cases; out of which 142 (77.2%) cases was male and 42 (22.8%) cases was female.

Highest number of victim was in age group 11-20 years, 39 (21.2%) cases.

Table 1: Age & Sex Wise Distribution Of Cases

AGE	MALE	FEMALE	TOTAL	%
0-10	13	04	17	9.2
11-20	30	09	39	21.2
21-30	26	07	33	18
31-40	17	05	22	12
41-50	24	07	31	16.8
51-60	22	07	29	15.5
61-70	04	01	05	2.7
71-80	06	02	08	4.3

During the month of June, July and August maximum number of cases was found, and highest incidence observed in the month of June (42 no cases, 22.9%)

Table 2: Month Wise Distribution Of Cases

Month	No. of Cases	%
January	01	0.5
February	0	0
March	02	1.1
April	06	3.3
May	09	4.9
June	42	22.9
July	40	21.7
August	33	17.9
September	26	14.1
October	16	8.7
November	05	2.7
December	04	2.2

Majority of incidence leading to drowning death occurred in pond (84 cases, 45.5 %) and river (62 cases, 33.6%).

Presence of external injury seen only in 16 cases (8.5%) and absent in 168 cases (91.5%).

Most of the cases (167 cases, 90.8%) were wet drowning type and 17 cases (9.2 %) were of dry drowning.

Skin changes like wrinkling, bleaching, soddening and peeling seen in various combinations in 145 cases (78.8%).

However in 39 cases (21.2%) there were no changes.

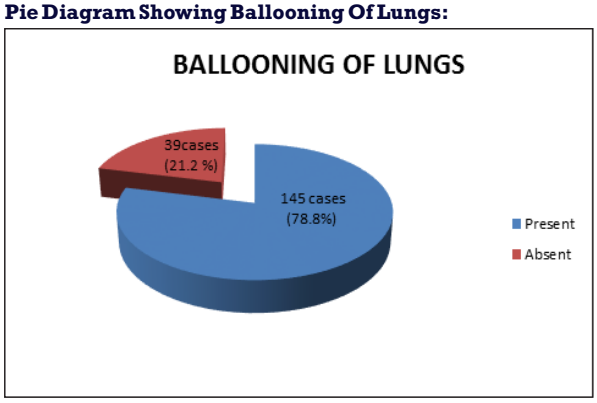
Presence of froth in mouth and nostrils was found in 34 cases (18.5%). However inside trachea it was found in 95 cases (51.6 %).

Sand and mud particles present in trachea and bronchioles was found in 164 cases (89.1 %).

Water, sand and mud particles was present inside the stomach in 144 cases (78.3%)

Ballooning of lungs was found in 145 cases (78.8 %) and absent in 39 cases (21.2 %).

Pie Diagram Showing Ballooning Of Lungs:



Congestion and oedema of lung was found in 143 cases (77.7 %).

Rib indentation marking on the lung surfaces was present in 85 cases (46.2 %).

Table 3: Rib Indentation Marking Of The Lung Surfaces

Rib indentation mark	No. of cases	%
Present	85	46.2
Absent	99	53.8

DISCUSSION:

The study showed that 6.4 % cases died from drowning. National Crime report Bureau (5.6%) [1], World health organisation (5.9%)[2], RongaRao et all (6.84%)[3] also found similar results.

Our study reflects male preponderance with 142 cases (77.2%) and also showed the highest number of cases (39cases, 21.2%) in the age group of 11-20 years. In a study by RangaRao et all also found 63.33% male and 19.69 % victim were in the age group of 11-20 years.[3] Tanuzkanchan et all also found 84.5 % male and 14.5 % female.[4] YinchaoZhu et all also found similar result (55.4%).[5]

Present study showed highest number of incidence in the month of June, July, and August, 22.9 %, 21.7 % and 17.9 % cases respectively which is also rainy season in our region. PalimarVikram et all also found majority of cases (67.2 %) during rainy season.[6]

We found maximum incidences occurred in open water sources like ponds (45.5%) and river (33.6%). Quan L et all found 69 % death occurred in open water such as pond and pools.[7] RangaRao et all found 76.6 % death occurred in lakes.[3] External injury was absent in majority of cases (91.5%) in our study. Vivian Hwang et all found external injury in 4.9 % cases, which is almost similar to our study.[8]

Most of the cases (90.8%) were wet droning, whereas only 9.2 % cases was dry drowning. R Sarvesvaran found 10-15%5 cases of dry drowning in his study.[9] Eleanor Carter et all found dry drowning in up to 15 % cases .[10]

Skin changes like wrinkling, bleaching, soddening etc. found in combination in 78.8 % cases; however presence of these changes varies according to place of occurrence and time of retrieval.

Our study showed typical froth found in mouth and nostril in 18.5 % cases and inside the trachea found in 51.6 % cases. Chidanand C et all also found froth in 83 % cases.[11] Lunetta P et all found external foam in 17.3 % cases and froth in airways in 46.5 % cases.[12]

Sand and mud particle inside the trachea and bronchiole was found in 89.1 % cases. Patel A et all found these in 100 % cases.[13]

We found water, mud and sand particle inside the stomach in 78.3 % cases. Theodore Harckeet all found fluid in stomach in 89 % cases.[14]

Congestion with oedema of the lung was found in 77.7 % cases and ballooning of lung found in 78.8% cases. Leticia et all found ballooning of lung in 82% cases.[15] Copeland said wet lung or ballooning of lung found in 80-90 % cases.[16]

In our study rib indentation marking over the surfaces of lung was found in 46.2 % cases. Lunetta P found rib marking in 42.1 % cases.[17]

CONCLUSION:

The present study highlights that maximum number of incidence occurs in open water spaces and also in younger age groups. People who live by the river banks and flood affected areas always remain vulnerable. Some of these incidences are preventable in nature.

Though not always consistent, findings of this study may be helpful for determination of death due to drowning.

It is suggested that knowledge of swimming, fencing of water bodies, covering of manhole and drain etc. is of utmost importance for prevention of drowning incidences. The younger children should not be left unattended. Improvement of living standard can also prevent some of the incidences.

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