

## A Study of Drowning Cases brought for Autopsy in GMCH Mortuary

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### **Abstract**

*Drowning is defined as the process of experiencing respiratory impairment from submersion/immersion in liquid; outcomes are classified as death, morbidity and no morbidity. Drowning is a violent asphyxial death, where air entry to lungs is prevented due to occupation of the lumen of respiratory tract with water or any fluid-media. Drowning is asphyxiation due to immersion in liquid. Drowning is the 3rd leading cause of unintentional injury death worldwide, accounting for 7% of all injury related deaths. Estimated rate 388,000 is the annual drowning deaths worldwide. China and India have particularly high drowning mortality rates and together contribute 43% of the world's drowning deaths and 41% of the total global DALYs (disability-adjusted life years) lost related to drowning. This study was conducted in the department of Forensic Medicine, Gauhati Medical College upon the cases brought for medico-legal autopsy during the period of 1<sup>st</sup> March 2016 to 28<sup>th</sup> Feb 2017. A total of 150 cases were randomly selected for the study.*

**Keywords:** Drowning, autopsy, asphyxial death

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### **INTRODUCTION**

Drowning is defined as the process of experiencing respiratory impairment from submersion/immersion in liquid; outcomes are classified as death, morbidity and no morbidity [1–5]. Drowning is a violent asphyxial death, where air entry to lungs is prevented due to occupation of the lumen of respiratory tract with water or any fluid-media [6–10]. Drowning is asphyxiation due to immersion in liquid. Drowning is the 3rd leading cause of unintentional injury death worldwide, accounting for 7% of all injury related deaths [1]. Estimated 388,000 annual drowning deaths are worldwide. China and India have particularly high drowning mortality rates and together contribute 43% of the world's drowning deaths and 41% of the total global DALYs (disability-adjusted life years) lost related to drowning [1]. The entire coastal belt of India is a risk-prone area. The male and female rates were 71% and 29%. Eighty-two per cent of deaths were in the age group of 15–59 years (11). In 2002 ~ 98000 lives were lost due to drowning in SEAR countries & was responsible for about 2.74 million DALYs lost. Survival period beyond 24 hours after the

victim is removed from the aqueous environment has been considered as 'near drowning'. Hypothermia and decrease in oxygen delivery to vital tissues, especially the brain, are the most important contributing factors towards morbidity and mortality resulting from near drowning. Laminar necrosis demonstrable in the brain, but not specific for drowning, are found in generalized brain hypoxaemia. Third layer of the brain is most vulnerable to depletion of O<sub>2</sub> and glucose. This study was conducted in the department of Forensic Medicine, Gauhati Medical College upon the cases brought for medico-legal autopsy during the period of 1<sup>st</sup> March 2016 to 28<sup>th</sup> Feb 2017 [11]. A total of 150 cases were randomly selected for the study [12].

### **AIMS OF THE STUDY**

1. To study the demographic pattern of drowning cases.
2. To study the probable causes of death in drowning cases.
3. To Study the associated injuries in drowning cases, if any.

## MATERIALS AND METHODS

This retrospective study was conducted in the department of Forensic Medicine, Gauhati Medical College and Hospital, Guwahati, during the period from 1st March 2016 to 28th Feb 2017. During the period a total number of 2997 cases were autopsied, out of which 198 cases were drowning cases. Information regarding the cases was collected from the accompanying police person, the eye witnesses and the relatives. A proforma was prepared accordingly, and at the end of the study period the results was prepared.

## OBSERVATIONS AND RESULTS

**Identity:** Out of all the drowning cases, majority were unknown cases.

**Sex:** Out of 198 cases considered most of the cases were male (144 cases).

**Age (as informed by Police/Informant/Relative):** Most of the victims were in the age group of 30–40 years, followed by 40–50 years.

**Occupation:** Most of the victims were businessman, followed by students.

**Place of Drowning:** Majority of the incident occurred in running water.

**Hospitalized or not:** Most of the victims did not receive any treatment and died on spot.

**Sand in Trachea:** Sand particle is found attached to the trachea mucosa (beyond bifurcation) in 164 cases of drowning.

**Injuries over the Body:** Abrasion is the most common injury found over the body followed by laceration and contusions. In most of the cases there were no external injuries detected over the body.

**Manner of Death:** Most of the cases were accidental in nature.

**Cause of Death:** Asphyxia is the most common cause of death among all the drowning cases. The mode of death in the decomposed cases could not be established.

**Interval between Fall in Water and Recovery of the Body:** most of the cases were recovered in the same day of fall in water. Only 26 cases were recovered within 48–72 hours and 9 cases were recovered even late i.e after 72 hours.

## DISCUSSION

Most of the cases were male, which is similar to the findings of Mukherjee AA, Dhawan SG, Dhoble SV [6]. In this study most of the victims were in the age group of 30–40 years, which is different from the findings of

Chakraborty YP, Singh PK, Chatterjee A *et al.* and also findings of Singh B *et al.* [8], Palimear V, Manjunath S, who found the most common age group involved to be 11–20 years [4]. Most of the victims were businessman and most of the incident occurred in running water. The findings are similar to the findings of Bose A *et al.* [3]. Asphyxia is the most common mode of death in the drowning cases. The findings are similar to the findings of Singh *et al.* and Mukherjee *et al.* [6].

## CONCLUSION

No forensic pathologist would deny the fact that there is not one pathognomonic autopsy finding indicative of the diagnosis of drowning. The best chance of making the diagnosis is when the body is not affected by putrefaction. In every case the diagnosis of drowning should be made by the elevation of the findings suggestive of drowning, the circumstantial details and the exclusion of other causes of death

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**Cite this Article**

Kan Bapu Choudhury, Arpan Mazumder. A Study of Drowning Cases brought for Autopsy in GMCH Mortuary. *Research & Reviews: Journal of Computational Biology*. 2017; 6(3): 9–11p.