

Age and Socio-economical Factor Affect Unintentional Death due to Drowning Recorded from an Autopsy Center in Dhaka

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Abstract:

Globally drowning remains a leading cause of unintentional mortality of all age and sex groups affecting highest rates in low and middle-income countries.

The objective of the study was to see the victims' of common age group and socio-economic characteristics who suffer death due to drowning in our country.

It was a retrospective study of 30 cases of drowning in 18 thanas of Dhaka district during 1st January 2012 to December 2014. All the cases were autopsied in the mortuary of Sir Salimullah Medical College, Dhaka. Autopsy was done in all those cases and opinion was drawn that deaths were due to asphyxia as a result of drowning which were antemortem in nature.

Total 30 cases were brought to the Department of Forensic Medicine at Sir Salimullah Medical College, Dhaka. Considering the socio-economic status of the victim, it is found that higher frequency of drowning in the lower socio-economic growth. And the victims of unnatural death and their age was in between 0-10 years which is 5 cases, 4 cases and 6 cases in the year of 2012, 2013 and 2014 respectively.

In the conclusion, the study reveals that majority drowning cases are from low socio-economic condition with an early age group. As drowning is preventable and simple steps can be taken to help with water safety, future study required for sustainable improvements in drowning prevention as well as increase emergency responsive services in all possible steps in order to prevent unnatural drowning deaths to overcome the situation.

Keywords: *Asphyxia, drowning, autopsy.*

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Introduction:

Drowning is a form of violent asphyxial death where the respiratory passage is occupied by

fluid or water, due to submersion under water and inhalation of water¹. Drowning literally means 'suffer death by submersion in water or any other liquid because of being unable to breathe'². Complete submersion is not necessary, for submersion of nose and mouth alone for a sufficient period can cause death from drowning³. Drowning is classified in to two major types: Typical drowning and atypical drowning. In typical drowning also known as wet drowning, there is actual destruction of the air passage by the fluid or water in to it. In atypical drowning there is very little or no fluid or water in to the air passage. It includes: dry drowning, immersion syndrome, submersion of unconscious and secondary drowning (near drowning)⁴. Recently drowning is also classified by outcome into: death ongoing health problems and no ongoing health problems⁵. Dry drowning

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is reported to account for 10-15 percent of all drowning cases in west⁶. And 10-20 percent of death due to drowning in India⁷. In immersion syndrome, death results from cardiac arrest due to vagal inhibition⁸. Submersion of unconscious occur due to asphyxia⁹.

Drowning remains an important public health problem around the world. As indicated by the World Health Organization, it is one of the 10 leading causes of death for individuals aged 1–24 years in every region of the world, and the 3rd leading cause of unintentional injury death globally, representing 7% of all injury-related deaths¹⁰. In 2013 alone, drowning caused around 368 100 deaths¹¹ and 21 608 000 disability-adjusted life years¹² worldwide. Over 90% of all the drowning fatalities occurred in low- and middle-income countries¹³; however, related researches and prevention strategies have been largely confined to high-income countries, especially the epidemiological studies on drowning mortality at the national level. Worldwide total number of death for the age of 1-4 years was 19,69,567. Of them 3.3% of total mortality of specific age group was due to drowning¹⁴.

Methodology:

This was a retrospective study which was carried out from January 2012 to December 2014. During this time all the medico-legal cases

were referred to the Department of Forensic Medicine at Sir Salimullah Medical College, Dhaka from different police stations of Dhaka district. Total number of 30 cases of unintentional death by drowning were found. The opinion regarding the cause and mode of death due to drowning was drawn by performing medicolegal autopsy. After fulfillment of prerequisites of autopsy, all body cavities were opened and the organs were examined thoroughly and the positive findings regarding confirmation of death caused by drowning were find out carefully.

Results:

Total 30 cases were brought by 18 police stations for medico-legal examination to the Department of Forensic Medicine at Sir Salimullah Medical College, Dhaka. The cases of the drowning victim were noted according to socio-economic condition (table 1). Considering the socio-economic status of the victim, higher frequency of drowning is found in the lower socio-economic group which is 18(60.0%) case

The age group was noted in table 2. Highest age group is present in the 0-10 years which is 5(33.3%) cases, 4(26.6%) cases and 6(40%) cases in the year of 2012, 2013 and 2014 respectively. The trend of drowning cases is increased from 2012 to 2014 which is 9(30.0%) cases and 12(40.0%) cases respectively.

Table-I

Distribution of cases according to socioeconomic status

Class	No. of cases (2012)	No. of cases (2013)	No. of cases (2014)	Total
Upper	2(40%)	1(20%)	2(40%)	5
Middle	2(28.5%)	2(28.5%)	3(42.8%)	7
Lower	5(27.7%)	6(33.3%)	7(38.8%)	18
Total	9(30%)	9(30%)	12(40%)	30

Table-II

Distribution of cases according to the age

Age group (in Year)	No. of cases (2012)	No. of cases (2013)	No. of cases (2014)	Total
0-10	5(33.3%)	4(26.6%)	6(40%)	15
11-20	3(33.3%)	2(22.2%)	4(44.4%)	9
21-30	1(16.6%)	3(50%)	2(33.3%)	6
Total	9(30%)	9(30%)	12(40%)	30

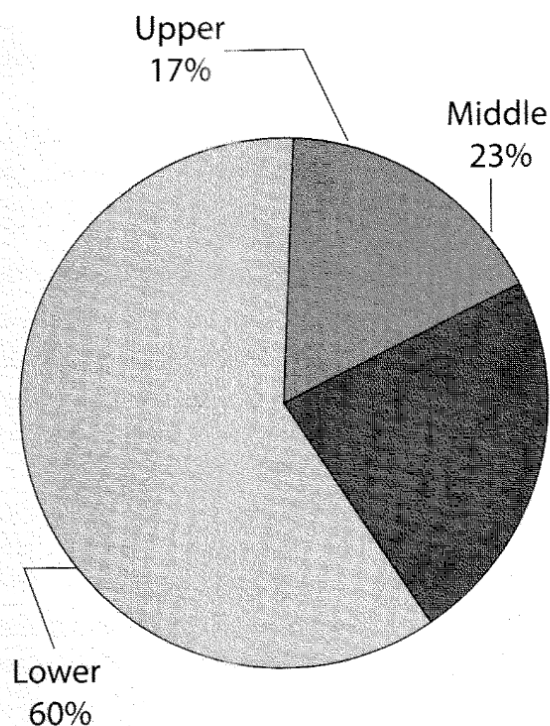


Fig.-1: Distribution of case according to socioeconomic status

The most common autopsy findings among the study population are recorded. During autopsy all 30(100.0%) cases have shown wet body and cloths, presence of mud and sand over the body, persistent copious fine leathery white froth from mouth and nasal opening, mud and sand in esophagus, stomach and intestine and voluminous, edematous balloon like lungs.

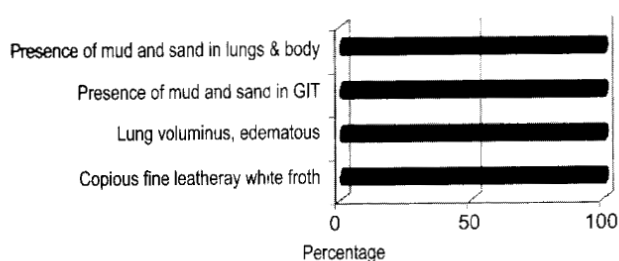


Fig.-2: Most Common autopsy findings among the study population (n=30)

Discussion:

A total number of 30 cases were brought by 18 police stations for medico-legal examination to the Department of Forensic Medicine at Sir Salimullah Medical College, Dhaka. The cases of the drowning victim were noted according to socio-economic condition. Considering the socio-economic status of the victim, higher

frequency of drowning is found in the lower socio-economic group which is 18(60.0%) cases. The reason of more victims in this socio-economic status may be due to bathing in the pond water which is due to lack of shower in their houses. To note that 91% of all global drowning fatalities occur in low- and middle-income countries¹⁵. Highest age group is present in the 0-10 years which is 33.3% cases, 26.6% cases and 40.0% cases in the year of 2012, 2013 and 2014 respectively. In this age group drowning is the most common. The trend of drowning cases is increased from 2012 to 2014 which is 30.0% cases to 40.0% cases respectively. The reason is lack of knowledge to swim in the water. However, negligence of toddlers is also responsible for this. A study in Matlab, Bangladesh showed that deaths due to drowning ranged from about 10-20% of child deaths of age 1-4 years¹⁶. In USA death rates and neonatal injury rates were highest among children < 4 years; these children most commonly drowned in swimming pools. If we look at the statistics in Canada, we will see that annually on average, 525 water related fatalities occurs. Children were at highest risk of death from unexpectedly falling into water. Children aged 1-4 years accounted for 21% of fatalities¹⁷. Interestingly the result of the study more or less corresponds with the findings of many other countries of the world; specially the age related fatalities and socio-economical circumstances found in our study.

Most unintentional drowning event occurred in communities with natural water such as rivers, lakes, ponds and sea; subsequently the victims are found dead at the scene many hours after the drowning event occurred. The signs of drowning in a dead body recovered from the water for the same period are wet body and cloths, presence of mud and sand over the body. Persistent copious fine leathery white froth has been found in mouth and nasal opening which is a vital finding in case of death due to drowning. However mud and sand are also found in esophagus, stomach and intestine on dissection. The lungs are found voluminous, edematous balloon like and appearance with marks of indentation over the surface by ribs. The lungs pit on pressure. Diatoms which are

unicellular algae are found in some remote organ and tissues including brain and bone marrow. There are changes in blood chemistry like increased chloride and potassium ion in fresh water drowning; on the other hand decreased sodium level, magnesium may be increased in salt water drowning. Death in drowning will show a discrepancy from country to country due to geographic environment, climate, and cultural activities which influence circumstances that may result in drowning. The pictures of death due to drowning will not be same if we compare them between district to district and division to division in our country as the number of victims of drowning will be more in localities where there is easy access to natural water like river, ponds etc.

Conclusion:

Deaths from any cause produce great repercussions in a developing nation affecting society at all levels. After considering the findings of this study, we conclude that drowning is one of leading public health hazards in our community. That is why preventable deaths must be approached with vigilance. Drowning is a preventable cause of

death and therefore, regarding this issue should be carried out and addressed appropriately as to take special measures and essential steps by government, nongovernment, and voluntary organization to save the lives of victims irrespective of age, sex, and socio-economical condition. But special attention should be attributed according to the findings of the study to save the lives of children who commonly become the victims of unintentional death due to drowning

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