

Original article

Three years case study of autopsy in drowning death at Dhaka South

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Abstract

Objectives : Drowning is one of the burdens of country's accidental death rate. In Bangladesh it is one of the commonest causes of death during rainy season in flood affected areas. There are more than 5 million people lived in Dhaka south. This study was done from autopsy conducted at Sir Salimullah Medical College morgue to find out the burden of drowning death.

Methods : A retrospective case study of drowning autopsy death at Sir Salimullah Medical College morgue was taken to analysis data during 2007-2009.

Results : The study showed that there were 136 drowning cases out of 1545 post-mortem cases. All were accidental Death.

Conclusion : All necessary measures to be taken for prevention of drowning.

Key words : Autopsy, Post-mortem, Drowning death

Introduction

Drowning is the process of experiencing respiratory impairment from submersion /immersion in liquid; outcomes are classified as death, morbidity and no mortality. In 2004, an estimated 388000 people died from drowning, making drowning a major public health problem worldwide. Injuries account for nearly 10% of global mortality. Drowning is the 3rd leading cause of unintentional injury death, accounting for 7% of all injury-related deaths¹. It is a form of violent asphyxial death due to aspiration of fluid in to the air passage caused by complete immersion or submersion in water or other fluid medium at the level of mouth and nostrils for a certain period of time².

The definition and types of drowning varies from country to country. In Bangladesh it is one of the commonest causes of death during rainy season in flood affected areas. Victims of drowning are most commonly children and old people. There is a wide range of uncertainty around the estimate of global drowning deaths.

Materials and method

Three years retrospective case study of drowning autopsy death at Sir Salimullah Medical College morgue was taken to analysis the data of Dhaka south Police stations respectively. There are 136 autopsy of drowning cases held during those three years out of 1546 autopsy cases at Sir Salimullah Medical College morgue.

The post-mortem of SSMC comprises the Dhaka South; there were 12 police stations under it. The 12 police station are - Kotwali, South Keraniganj, Dhohar, Kamrangirchar, Kadamtoli, Shampur, Lalbag, Nababganj, Hazaribag, Sutrapur, Demra and Jatrabari. There were more than 3 million people resided there during these period. The three years case study shows different trends of age distribution, monthly case distribution, gender distribution, Thana distribution and manner of death.

Results

The study showed that there were 136 drowning cases out of 1545 post-mortem cases. All of drowning death was regarded as accidental cases. Age distribution states that drowning victims are common among young adults. Most common age group was 10-39 years. Most common victims are in 20-29 years (Fig-1). Of them 118 were male, 23 were female, 116 cases were Muslims whereas 08 cases were Hindu and 07 cases are of unknown religion (Table-1). Out

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of 136 drowning death, 104 cases were unknown death and 32 were known (Fig-2). Most of the drowning cases were coming from South keranigonj Ps which resides on the bank of river Buriganga (Table-2).

Statistic showed drowning was more common in rainy season than winter season. Due to the River Buriganga is the center of Dhaka south, so cases of drowning death is one of the important factors of post-mortem examination in SSMC morgue (Table-3).

Table-1: Sex and Religion distribution of Victims

| Sex | frequency | % |
|----------|-----------|---|
| Male | 118 | |
| Female | 23 | |
| Religion | | |
| Muslim | 116 | |
| Hindu | 08 | |
| Unknown | 07 | |

Fig-1 : Age distribution pattern of drowning death

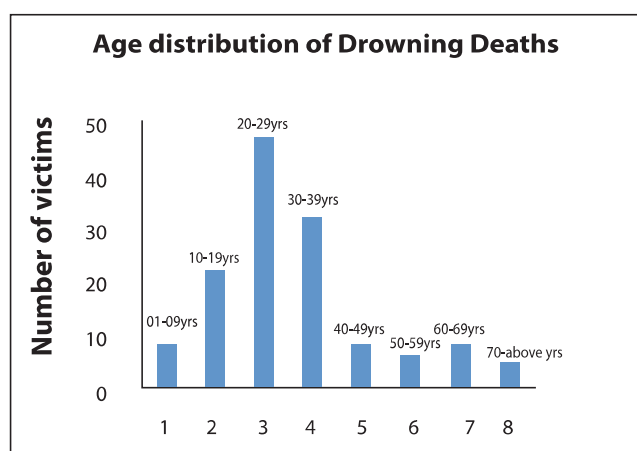


Fig-2 : Identification of Drowning cases

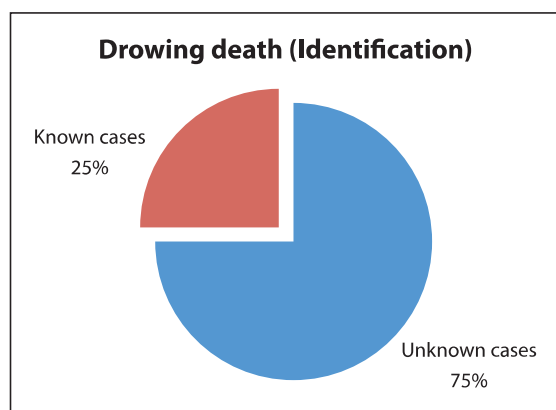


Fig-3 : Statiscal data showing Drowning death during the year of 2007-2009)

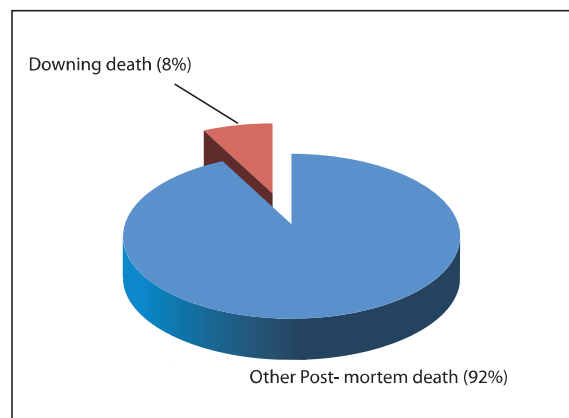


Fig-4 : Yearly distribution of drowning death.

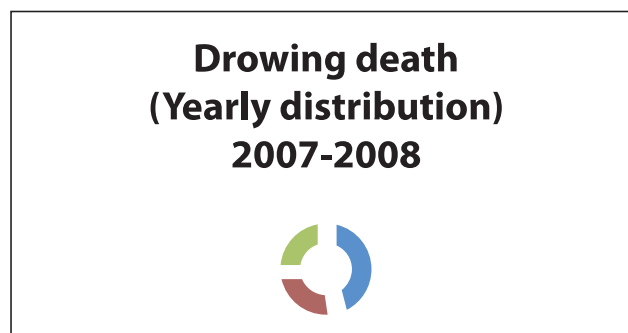


Table-2 : shows three years case study of Downing cases in P.S level.

| Police station | No of victim |
|------------------|--------------|
| South Keraniganj | 90 |
| Kotwali | 06 |
| Nababgang | 06 |
| Dohar | 02 |
| Demra | 05 |
| Lalbag | 02 |
| Shampur | 04 |
| Jatrabari | 05 |
| Sutrapur | 04 |
| Kamrangirchar | 10 |
| Hazaribag | 02 |
| Kamrangirchar | 10 |
| Hazaribag | 02 |

Table-3 : showing monthly distribution of drowning cases

| Month | No of victim |
|-----------|--------------|
| January | 09 |
| February | 13 |
| March | 10 |
| April | 05 |
| May | 21 |
| June | 14 |
| July | 15 |
| August | 12 |
| September | 13 |
| October | 08 |
| November | 05 |
| December | 11 |

Discussion

Study showed in years 2007-2009; there were 1545 post-mortem held at SSMC Morgue, of them 136 cases were drowning death. About 1/12 deaths are drowning cases. Study showed rainy season was the most vulnerable time for drowning death.

Bangladesh is the land of river. Most of the peoples live in village. During rainy season, every year country faces flood in most of the district. So drowning cases were more frequent during rainy season(May-September). This three years case study suggests that most of the victims were young adult and incidence was frequent in rainy season. Male victims were more than female because of their more exposure to pond, river, sea etc. Non-swimmers are most common victims of drowning death in our country.

Another major problem in autopsy was identification of unknown victims. About 8% from all autopsy cases were drowning death which is the one of important factors of accidental death in our country. In Dhaka south, South keraniganj is the most vulnerable place of drowning cases due to river Buriganga.

International study

Drowning is a common cause of death and disability. In 2002 over 400,000 (worldwide) people died from

drowning; of the 400,000 deaths, 129,000 were in China. In the US it is the third most common cause of accidental death, with 3,500 deaths per year, or 10 per day. Twenty-five percent of the victims are children aged 14 and younger. The death rate from drowning does not reflect the potential morbidity (disability) due to brain injury for those who survive a drowning episode⁵.

WHO response

Prioritizing research and public health initiatives to determine the burden and risk factors for drowning worldwide is crucial. Defining clear objectives such as quantifying the magnitude of the problem, identifying vulnerable populations, risks, exposures, and strengthening emergency response services is necessary, while focusing prevention interventions and advocacy on those populations most affected^{3,4}.

Risk-factors of drowning (WHO study)

Major risk factors for drowning by all causes include:

Sex:

- Males are more likely to die or be hospitalized due to drowning than females
- Males in the African region and Western pacific region have the highest drowning-related mortality rates.
- WHO Studies suggest males have higher drowning rates than females due to
 - Increased exposure to water and riskier behaviour, such as swimming alone
 - Drinking alcohol before swimming alone, and boating

Age

- Among the various age groups, children under five years of age have the highest drowning mortality rates worldwide Canada and New Zealand are exceptions, where adult males have the highest rates
- Drowning is the leading cause of injury death to children aged 1-14 years in China
- In Bangladesh, 20% of all deaths in children aged 1-4 years are due to drowning
- Drowning was the second leading cause of unintentional injury death in children aged 1-14 in the United States in 2000 (18.1%)

- Drowning is the leading cause of unintentional injury death in children aged 1-3 in every Australian state
- Drowning in young children is often associated with a lapse in supervision

Occupation

- The occupational mortality rate in Alaskan commercial fishermen is 116 per 100000. Approximately 90% of these deaths are by drowning
- Small-boat subsistence fishing in low-income countries is associated with many drowning deaths

Floods*

- Large numbers of drowning deaths are associated with floods worldwide, including thousands of deaths in single countries, such as China

Transportation*

- Vessels that may be unsafe or overcrowded (including refugee boats and poor weather conditions are associated with large, though unknown, numbers of drowning deaths every year
- 90% of Canadian boating victims of drowning were not wearing a floatation device

Alcohol

- Alcohol is a risk factor for drowning among adolescents and adults, though the proportion of drowning victims testing positive for blood alcohol concentration levels depends on the country reported
- Alcohol may impair parental supervision of children near water.
- Alcohol or drug use was implicated in 14% of unintentional drowning fatalities in Australia in persons greater than 14 years, of whom 79% were male

Epilepsy

- Children with epilepsy are at significantly greater risk of bath and pool drowning, compared to children without epilepsy.
- In Sweden, drowning was the cause of death in approximately 10% of people with a history of epilepsy (1975–1995)
- In Canada, most epilepsy-associated drowning deaths

occur to adults in bathtubs

Socio-economic status

- Ethnic minority groups generally have higher drowning death rates, possibly due to differences in opportunities to learn to swim.¹
- In Bangladesh, children whose mothers have only primary education are at significantly greater risk of drowning compared with children whose mothers have secondary or higher education

Access to water

- In Bangladesh, most young children who die from drowning are aged 12-23 months, with most fatalities occurring as a result of falling into ditches and ponds.

Prevention of drowning : (International approach)

Remove the hazard:

- Drain unnecessary accumulations of water (e.g. baths, ponds, buckets, etc.).

Create barriers

- Build flood control embankments in flood-prone areas
- Implement and enforce mandatory isolation fencing for swimming pools
- Where possible, fence around rural fish ponds, construction ditches (where filled with rainwater) and other bodies of water around houses and in the community.
- Encourage fencing around rural homes in proximity to water (e.g. farmhouses).
- Encourage the use of grills over water wells

Protect those at risk

- Promote “learn to swim” programs for primary school children, especially in low- and middle-income countries
- Increase access to public swimming pools to promote learning to swim
- Swimming and water-safety skills are associated with significant reductions in drowning fatalities
- Increase awareness of the need to supervise children both in and outside the home, and establish parent groups or other childcare mechanisms in rural communities, especially around harvest times

- Instruct children to avoid entering fast-flowing streams, and not to swim alone.
- Train lifeguards for regular deployment in supervised swimming locations
- Harmonize internationally the flags and symbols used for beach safety.
- Educate and/or legislate against consuming alcohol while boating or around large bodies of water
- Increase education in boat safety regulations as well as of the need for personal floatation devices when boating
- All boats and larger vessels should be checked regularly for safety, including safety equipment, and never exceed the maximum passenger capacity for which they were designed².

Counter the damage

- Train the general community in resuscitation. Timely resuscitation initiated by layperson bystanders increases the survival prospects of pediatric drowning victims.

Conclusion

Drowning is one of the burdens of country's accidental death rate. Male predominance, Young adult victim, low socio-economic status, yearly flood due to global climate revolutionize, unrevealed victim are the most common problem to avert the drowning cases. So, all necessary measures to be taken for prevention of drowning to reduce overall morbidity and mortality rate of unintentional death of our country.

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