Fatal Drowning in Delta State, Nigeria: A Retrospective Study of Cases in this Region

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Abstract

Introduction: Drowning death is a preventable, under-reported public health problem resulting from respiratory insufficiency secondary to immersion or submersion in liquid.

Aim: To study the sex, age, and place of death of victims of fatal drowning in Warri, Delta state, Nigeria.

Material and Method: This is a descriptive, retrospective study of cases of fatal drowning reported to the coroner and subjected to postmortem examination by the authors in Delta State from 1st January 2003 to 31th December 2016. Basic information such as the age, sex and place of death were extracted and analyzed using Microsoft Office Excel, version 2007.

Results: Thirty-seven victims comprising of 34 males and 3 females were examined during this study, giving a mean incidence of about 2.5 cases per annum. Their ages ranged from 1.5 to 59 years with a mean of 28. 53 years and a dual peak in the 3rdand 4th decades. All the deaths were of accidental causes, with most the of them (70%) occurring within natural water bodies.

Conclusion: The study showed that drowning death is relatively common and usually of accidental etiology. Young males in their thirties and forties are the most vulnerable victims, with the natural water bodies being the most common site of drowning. Being a preventable cause of death, adopting and enforcing preventive safety measures by the individuals, community and government will invariably reverse this trend.

Key word: *Drowning, Medicolegal, Preventable death*

Introduction

According to statistics from WHO, unintentional injuries account for 3.9 million deaths annually with about 90% of these cases occurring in low and middle income countries (LMIC). These are attributed mostly to road traffic accident (RTA), fall, drowning, poisoning and burn.[1]

Drowning is currently defined as "the process of experiencing respiratory impairment from partial or complete submersion/immersion in liquid". Its outcome may be fatal (death) or non-fatal, the latter of which may be with or without morbidity.[2]

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Though preventable, fatal drowning has become a serious public health issue globally ranking among the three leading causes of injury related death in most countries.[3] According to WHO report, drowning accounted for about 372,000 deaths in 2012, with 91% of these deaths occurring in LMIC.[4] Children have been shown to be particularly susceptible with about 450 dying daily from drowning, and a significant number suffering from varying grades of morbidities. [5] Sadly, the African continent accounts for the highest drowning mortality with a rate 13.1 per 100,000 population.[6]

Delta State of Nigeria is unique because of numerous unprotected natural water bodies with 35% of its 16,842 square kilometers total land area being riverine. It also has a high density of streams, ponds, lakes, creeks as well as the large body of ocean waters.[7]

Despite the burden of drowning death, there is paucity of research on this subject matter in this region. This study is aimed at analyzing the age, sex and death-place of victims of fatal drowning, examined by the authors during the study period. Being the earliest of such study in this part of the world, we hope the findings will increase public and government awareness of magnitude of the problem, guide government policy formulation, contribute to literature and lastly suggest direction for subsequent research.

Materials and Method

This is a 14-year descriptive retrospective study of drowning deaths recorded by the authors in Warri. Delta State from January 2003 to December 2016.

All medicolegal autopsies performed in this region by the authors were reviewed and confirmed cases of drowning identified for this study. The information used for this study includes the age, sex, circumstance and site of death of the victims. This information was subsequently analyzed using excel spread sheet and presented in tables.

Exclusion criteria: All cases of post-mortem drowning as well as cases of doubtful history were excluded from the study.

Result

In this retrospective study, 1121 medicolegal autopsies were analyzed, out of which 37(3.3%) of the cases were as a result of drowning.

The age distribution of victims is shown in table 1, ranging from 1.5 years to 59 years, with a mean age of 28.53 years and two unimodal peaks occurring in the 3rd and 4th decade.

The sex distribution of the victims is shown in table II, with males and females accounting for 34 (91.9%) and 3 (8.1%) of the cases respectively.

Table III showed the places where the drowning occurred. Natural waters (Oceans, creeks, rivers, streams and lakes) were the site of occurrence in 26 cases (70.3%). Interestingly, two of these deaths took place during immersion baptism. Three cases (8.1%) occurred in water well. Coincidentally, two cases each (5.4%) were recorded in four different setting during the study namely: fish pond, pipeline excavation pits, gas tanks and swimming pools.

Table 1 Age distribution of victims of death by drowning

Age of victims (years)	Frequency	Percentage (%)
0-10	2	5.4
11-20	6	16.2
21-30	12	32.4
21-40	12	32.4
41-50	3	8.1
51-60	2	5.4
Total	37	100

Table II Gender distribution of the Victims

Gender of victims	Frequency	Percentage (%)
Males	34	91.9
Females	3	8.1
Total	37	100

Table III: Place of Occurrence of fatal drowning

Place of Occurrence	Frequency	Percentage (%)
Fish pond	2	5.4
Gas tank	2	5.4
Excavated Pit	2	5.4
Natural bodies of water (Rivers/Lakes/Creeks)	26	70.3
Swimming pool	3	8.1
Wells	2	5.4
Total	37	100

Discussion

Thirty seven (3.3%) of the medicolegal deaths in the study population were drowning death. This figure is intermediate between 2.2% reported by Nwafor and Akhiwu [8] in Benin City, Nigeria and 4.3% reported by Ngbea et al[9] in Makurdi, Nigeria.

We are of the opinion that this is a gross underestimation of its burden because of endemic inefficiency at data collection often seen in developing countries, and the poor attitude towards reporting accidental deaths to the police. The trend of practice where relatives of the deceased are made to pay for the autopsy has also not encouraged these relatives to report such cases to the police.

This study showed that males were found to be 11.3 times at higher risk, than the females. The high male to female ratio observed in this study concurs with reports from 62 articles in English literature reviewed on this subject matter in which a mean male-female ration (MFR) of 3:1 was observed. [10] This male predominance may be attributed to their greater involvement in boat-driving and other boat-centric jobs, including fishing and trading. Inherently, the males are more aggressive, competitive, and take on to riskier activities and behaviors some of which include alcohol, drug abuses and swimming alone, all of which may further increase the risk of drowning. [8,11,12,13] Activities in the water bodies such as crude oil theft and sea piracy which are common activities in this region may also doubt contribute to this ugly trend. [14]

A double unimodal peak was observed in the 3rd and 4thdecade, with each peak representing 32.5% of the cases. This is most likely as a result of the active lifestyle of this age group. Our observation compares favorably with those from Benin City, Nigeria, where the highest number of victims were in their 3rd decade,[8] but contrasts with report from an earlier study in the Niger Delta region which recorded the highest number of cases in the 6th decade of life.[12] Drowning death risk is highest among children globally.[6] In the index study, 18.9%% of the victims were children, majority of which were in their 2nd decade of life. This is lower than earlier report among children in Benin City and Niger Delta region. Lapses in supervision especially from parents has always been the major explanation to drowning among children.[8] The lower incidence of childhood drowning death in Nigerian series, relative to the global trend, may be attributed to case underreporting as natives in the study population attach less significance to death of children than that of adults.

Environmental factors, culture, behavior of the people as well as the geography of the environment play remarkable roles in the setting of drowning death. Delta state has a rich network of natural body waters, with a lot of transportation, recreational, fishing and trading activities.[8,11] This may explain the occurrence of most cases of drowning death in these natural water bodies. Our report is similar to findings in Bangladesh with 95% of cases reported in a similar setting.[14] Likewise, Sheikhazadi in Iran,[13] and Pal et al[15] in India reported 83% and 81.8% cases respectively in fresh water setting.

Our study also concurs with an earlier report by Seleye-Fubara in Niger Delta region.[12] On the contrary, Nwafor et al reported lower frequency of drowning death in natural water bodies in Benin, a city that has fewer rivers within its geographic boundaries.[11]

The two cases of drowning during baptism recorded in this study is a cautionary call to the church as it underscores the imminent danger of such activities. There is need to re-orient the church to avoid such practices where possible and if unavoidable, to adopt preventive measures including use of protective devices and employing divers to avert grave consequences. Arresting and prosecuting church leaders will act as a deterrent to others.

Public swimming pools were the second most common site (8.1%) of drowning death in this study. This is a reflection of proliferation of swimming pools in modern hotels and bars, probably an influence of westernization of our culture. We think this is mainly as a result of misadventure and recklessness of the victims, who are predominantly young. It is a general observation that these setting encourage alcohol and drug use, the role of these substances in the risk of drowning may not be overemphasized. Earlier reports have shown that swimming under the influence of alcohol is associated with increased risk of drowning death.[13] In USA, the highest rate of drowning occurred in swimming pools, which disagrees with our report.[15] In Japan, the highest drowning death occurred in bathtubs, mostly affecting the elderly persons.[16] Enforcement of fencing of Public swimming pools and use of personal floating devices routinely are worthwhile preventive measures.

Wells, fish ponds, pits and gas tanks accounted for the remaining settings for drowning death in this study. These settings are all products of man's activities and interference with the natural environment. Therefore, using barrier fencing, caution signs, early filling up of ditches and pits, especially at sites of road construction will no doubt prevent such accidents.

With respect to forensic etiology, accidental drowning accounted for all the cases. Sheikhazadi in Iran,[13] Nwafor in Benin, Nigeria,[8] and Seleye-Fubara in Niger Delta region, Nigeria[12] observed that most cases were of accidental causes. The rarity of homicidal drowning may not be unconnected with the difficulty in drowning a healthy conscious adult. As in our study, suicidal drowning was not reported in other Nigerian studies. [8,12,13] Though there has not been any study on suicide in this region, earlier studies among Nigerian Yorubas (a major ethnic group in Southern Nigeria) showed a strong negative attitude towards Suicide.[17.]

In conclusion, the study showed that drowning death is relatively uncommon and all of accidental etiology in this study. Young males in their thirties and forties are the most vulnerable victims, with the natural water bodies being the most common site of drowning. Being a preventable cause of death, adopting and enforcing preventive safety measures by the individuals, community and government will invariably reverse this trend.

Limitation of the study:

The relatively small sample size, under-reporting of the cases, the effect of co-morbid conditions, drugs and alcohol may interfere with the outcome of this report.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical approval was obtained from the ethical clearance committee of Delta State Hospital management Board/Central Hospital, Warri (reference CHW/ECC VOL1/124).

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