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Original Research Article.

Retrospective Analysis of Drowning Death Cases at a Tertiary care Centre In Uttar Pradesh

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ABSTRACT

Background: Drowning is a leading cause of mortality, morbidity, and disability across the world. Drowning deaths can occur during various water activities such as swimming, bathing, boating, and in incidents with motor vehicles. Hence; the present study was undertaken for assessing drowning death cases.

Materials & Methods: A total of 80 cases in which death was reported to be due to drowning were included in the present study. Complete demographic details of all the patients were obtained from the case files. Biochemical reports were analyzed to assess the alcohol and drug concentrations. A master-chart was prepared and complete details were summarized and were subjected to statistical analysis. All the results were analyzed by SPSS software.

Results: 60 percent of the patients were of rural residence while the remaining 40 percent were of urban residence. Alcohol and drug abuse were found to be present in 23.75 percent and 13.75 percent of the patients.

Conclusion: Alcohol and drug abuse are common causes of drowning.

Key words: Death, Drowning.

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INTRODUCTION

Drowning is a leading cause of mortality, morbidity, and disability across the world. An estimated 372,000 drowning deaths occur worldwide annually, although this is very likely to be under-estimated. As a result of development and increased investment in the area of injury prevention and water safety regulation, a decreasing trend in the global incidence of unintentional drowning deaths has been observed. Despite this promising trend, less is known as to whether this downward trend in unintentional deaths is reciprocated by a decline in intentional drowning death rates.[1-3]

Drowning deaths still constitutes a significant proportion of unnatural deaths. Although there has been a decrease in the number of drowning deaths (especially among children), it is unclear whether the incidence is still high in some groups. Drowning deaths can occur during various water activities such as swimming, bathing, boating, and in incidents with motor vehicles. Another common circumstance is suicide, often related to a previously known psychiatric illness. Disease, such as epilepsy, may also play a role in drowning.[4-6] Hence; the present study was undertaken for assessing drowning death cases.

MATERIALS & METHODS

The present study was conducted in the Department of Forensic Medicine, Krishna Mohan Medical College & Hospital, Mathura, Uttar Pradesh (India) and it included assessment of drowning death cases. Ethical approval was obtained from institutional ethical committee after explaining in detail the entire research protocol. A total of 80 cases in which death was reported to be reported due to drowning were included in the present study. Complete demographic details of all the patients were obtained from the case files. Biochemical reports were analyzed to assess the alcohol and drug concentrations. A master-chart was prepared and complete details were summarized and were subjected to statistical analysis. All the results were analyzed by SPSS software. Univariate regression analysis was done for assessment of level of significance.

RESULTS

In the present study, a total of 80 drowning cases were analyzed. 41.25 percent of the patients belonged to the age group of less

than 25 years. 35 percent of the patients belonged to the age group of 25 to 40 years. 63.75 percent of the patients were males while the remaining 36.25 percent were females. 60 percent of the patients were of rural residence while the remaining 40 percent were of urban residence. Alcohol and drug abuse were found to be present in 23.75 percent and 13.75 percent of the patients.

Table 1: Age and gender wise distribution

Parameter		Number of patients	Percentage
Age group (years)	**Less than 25**	33	41.25
	25 to 40	28	35
	More than 40	19	23.75
Gender	**Males**	51	63.75
	Females	29	36.25
Residence	**Rural**	48	60
	Urban	32	40

Table 2: Alcohol and drug abuse

Parameter		Number of patients	Percentage
Abnormal high blood alcohol levels	**Present**	19	23.75
	Absent	61	76.25
Abnormal high drugs levels	**Present**	11	13.75
	Absent	69	86.25

DISCUSSION

Prevention is vital in reducing the mortality and disability caused by a drowning incident, including an intentional drowning. It has been proposed that examining all-intent drowning deaths is valuable, as measures used to prevent unintentional drowning may also be appropriate for intentional drowning; and due to the difficulty in determining intent of drowning fatalities.[6- 9] Hence; the present study was undertaken for assessing drowning death cases.

In the present study, a total of 80 drowning cases were analyzed. 41.25 percent of the patients belonged to the age group of less than 25 years. 35 percent of the patients belonged to the age group of 25 to 40 years. Brüning C assessed 44 childhood drowning cases. A total of 44 children suffering a drowning accident within the last 48 hours were analyzed. A retrospective analysis using a structured questionnaire was done. Social demographic data, accident progress, clinical results and progress as well as outcome of the cases were investigated. Sixty percent of the children came from stable social backgrounds. Half of the children suffered from drowning in created swimming pools or ponds, the rest in natural waters, public pools and sources of water in the household. The median submersion lasted 2 minutes. Correlation of submersions below 1 minute with a good, and submersions above 10 minutes with a negative outcome was shown. A Glasgow Coma Scale (GCS) of 3 points (n = 15) and pupils without light reaction (n = 14) were associated with a lethal outcome or residual neurological deficits. Looking at the laboratory values, correlation between severe acidotic pH-values with a very low base excess, high blood sugar as well as high lactate values and a poor outcome is revealed. Six patients died within the first 24 hours, 6 more over the course suffering organ failure or brain death. Five children retained neurological damages. Twenty-seven children could be released from the clinic healthily. The risk of suffering a drowning incident is highest for boys aged 1-3 years, playing in the yard by themselves.[10]

In the present study, 63.75 percent of the patients were males while the remaining 36.25 percent were females. 60 percent of the patients were of rural residence while the remaining 40 percent were of urban residence. Lavelle JM et al reported the neurologic outcome of a series of near-drowning victims treated with supportive management without aggressive cerebral resuscitation. Forty-four pediatric submersion victims were treated with therapy limited to the support of vital functions. Three patients who met cold-water drowning criteria were excluded from the analysis for predictors of neurologic outcome. In their warm-water near-drowning patients, 56% survived neurologically intact, 32% survived in a persistent vegetative state, and the remaining 32% died. Unreactive pupils in the Emergency Department and a Glasgow Coma Score of < or = 5 on arrival to the ICU were the best independent predictors of poor neurologic outcome (odds ratio and 95% confidence intervals 374 [17 to 16,000] and 51 [5 to 2,200], respectively). However, no predictor was absolute and two nonhypothermic patients who arrived to the Emergency Department without vital signs, requiring cardiopulmonary resuscitation and cardiotonic medications, had full neurologic recovery. Their results casted further doubt on the utility of aggressive forms of cerebral monitoring and resuscitation and emphasize the need for initial full resuscitation in the Emergency Department.[11]

In the present study, alcohol and drug abuse were found to be present in 23.75 percent and 13.75 percent of the patients. Ahlm K et al investigated the epidemiology and current trends of unintentional, intentional, and undetermined drowning deaths with emphasis on the presence of alcohol and other drugs. During an 18-years period, 5,125 drowning deaths were autopsied in Sweden. Data on cases including toxicological analysis on alcohol, pharmaceutical drugs, and illicit drugs were obtained from the National Board of Forensic Medicine. During the study period, the annual incidence of drowning deaths in Sweden was

3.1/100,000 inhabitants and decreased on average by about 2% each year (p<0.001). The highest incidence was found among males and in middle/older age groups. The incidence increased 3% for each year of age. Children/adolescents (≤18 years) constituted 5% of all drowning deaths. Of all drowned females in the study, 55% (847/1,547) committed suicide, which was a significantly higher proportion compared with males (21%, 763/3,578) (p<0.001). In total, 38% (1,656/4,377) of tested drowned persons had alcohol in their blood and the mean concentration was 1.8 g/l. In the unintentional drowning group, intentional drowning group, and the undetermined group, the proportion of alcohol positive was 44%, 24%, and 45%, respectively. One or several psychoactive drugs were present in the blood in 40% (1,688 /4,181) of all tested persons and in 69% (965/1,394) of tested persons who died from suicidal drowning. The most common drug was benzodiazepines (21%, 891/4,181). Illicit drugs were detected in 10% (82/854) of tested persons. Presence of alcohol and drugs were frequent and may have contributed to the drowning deaths.[12]

CONCLUSION

From the above results, it can be concluded that alcohol and drug abuse are common causes of drowning. However; further studies are recommended.

REFERENCES

1. World Health Organization. Global report on drowning: preventing a leading killer: World Health Organization; 2014.
2. Gjertsen F, Bruzzone S, Vollrath ME, Pace M, Ekeberg Ø. Comparing ICD-9 and ICD-10: the impact on intentional and unintentional injury mortality statistics in Italy and Norway. Injury. 2013;44(1):132–138.
3. Mokdad AH, Forouzanfar MH, Daoud F, Mokdad AA, El Bcheraoui C, Moradi-Lakeh M et al. Global burden of diseases, injuries, and risk factors for young people's health during 1990-2013: a systematic analysis for the global burden of disease study 2013. Lancet. 2016;387(10036):2383–2401.
4. Grajda A, Kułaga Z, Gurzkowska B, Góźdź M, Wojtyło M, Litwin M. Trends in external causes of child and adolescent mortality in Poland, 1999–2012. Int J Public Health. 2017;62(1):117–126.
5. Peden AE, Franklin RC, Mahony AJ, Scarr J, Barnsley PD. Using a retrospective cross-sectional study to analyse unintentional fatal drowning in Australia: ICD-10 coding-based methodologies verses actual deaths. BMJ Open. 2017;7(12):e019407.
6. Haagsma JA, Graetz N, Bolliger I, Naghavi M, Higashi H, Mullany EC, Abera SF, Abraham JP, Adofo K, Alsharif U, et al. The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the global burden of disease study 2013. 2015.
7. Staines C, Ozanne-Smith J. Drowning deaths between 1861 and 2000 in Victoria, Australia. Bull World Health Organ. 2017;95(3):174–181.
8. Ahlm K, Lindqvist P, Saveman B-I, Bjornstig U. Suicidal drowning deaths in northern Sweden 1992-2009 - the role of mental disorder and intoxication. J Forensic Legal Med. 2015;34:168–172.
9. Byard RW, Houldsworth G, James RA, Gilbert JD. Characteristic features of suicidal drownings: a 20-year study. Am J Forensic Med Pathol. 2001;22(2):134–138.
10. Brüning C, Siekmeyer W, Siekmeyer M, Merkenschlager A, Kiess W. Retrospective analysis of 44 childhood drowning accidents. Wien Klin Wochenschr. 2010 Jul;122(13-14):405-12.
11. Lavelle JM, Shaw KN. Near drowning: is emergency department cardiopulmonary resuscitation or intensive care unit cerebral resuscitation indicated? Crit Care Med. 1993 Mar;21(3):368-73.
12. Ahlm K, Saveman BI, Björnstig U. Drowning deaths in Sweden with emphasis on the presence of alcohol and drugs - a retrospective study, 1992-2009. BMC Public Health. 2013 Mar 11;13:216..

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