

Non-commercial, Accidental Water Transport (Boating) Fatalities

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Summary. A study of non-commercial accidental water transport (boating) fatalities was performed on the case files of the Office of the Medical Examiner of Metropolitan Dade County in Miami, Fla., during the years 1980–1984. A total of 23 cases were collected and analyzed as to the age, race, sex, and the cause of death of the victim along with the blood alcohol content and the Urine EMIT drug screen at autopsy. Furthermore, the type of boat involved, the geographic locale, the time of the incident, the reason or risk factor for the incident, and the scene circumstances were also noted. Commonly, one is dealing with a male population below the age of 30 years who die of drowning. In approximately half of the cases alcohol is detected. The scenario involves “small” boats or canoes in the Atlantic Ocean or in canals in the afternoon or evening. Inexperience in boating/or stupidity plays a key role. A discussion ensues concerning recommendations designed to avoid such tragedies.

Key words: Boating fatalities, accident prevention – Influence of alcohol, boating fatalities

Zusammenfassung. Es wird über 23 Todesfälle nach Bootsunglücken berichtet; es handelte sich um nicht-kommerziellen Bootsverkehr. Unter forensisch-medizinischen, technischen und epidemiologischen Aspekten wurden die Handakten des „Medical Examiner of Metropolitan Dade County“ in Miami, Florida, aus den Jahren 1980–1984 untersucht. Die Opfer waren zumeist junge Männer unter 30 Jahren, die einen Ertrinkungstod erlitten. Die Unfallursachen waren zumeist Unerfahrenheit oder mangelnde Vorsicht; in der Hälfte der Fälle bestand Alkoholeinfluß. Präventive Sicherheitsbestimmungen für den Freizeit-Bootsverkehr werden angeregt.

Schlüsselwörter: Bootsunfälle, Unfallverhütung – Alkoholeinfluß, Bootsunfälle

Introduction

Boats are useful conveyances for merchandise and people. In the USA, they are also used quite frequently for non-commercial or "pleasure" activity. As with most modern, mechanical devices, boats can also lead to death or injury [1, 2]. While traumatic death is common in the USA [3], deaths due to non-commercial boating activities have not yet been reported in the forensic literature. Accordingly, this study was performed to see what useful information can be obtained from such case material.

Materials and Methods

Metropolitan Dade County in Miami, Fla., is a community of 2,000 square miles (5,180 km²) and a 1985 estimated population of 1.75 million people. It is a traditional resort and retirement area; but, increasingly it is a growing center for shipping and commerce. Given the close proximity to the Atlantic Ocean, the Miami River, several lakes, and canals, pleasure boating is popular with 43,000 pleasure boats registered in Dade County along with 1,400 commercial boats also registered [4]. The Office of the Medical Examiner is empowered by statutory law to investigate those deaths which occur within the county of a violent, unnatural or unexpected means. Some 3,500 cases are investigated annually; of these, approximately 2,800 cases are autopsied. For this study, all accidental, non-commercial, water transport (boating) fatalities during the years 1980–1984 were collected. These 23 cases were then analyzed as to the age, race, sex, and cause of death of the victim along with the toxicologic analyses for blood alcohol content and Urine EMIT drug screen at autopsy. Furthermore, the scene circumstances were analyzed and included a survey of the type of boat involved, the geographic locale of the incident, the time of the incident, the reason for the incident, and the terminal scenario.

Results

Table 1 gives the age distribution of the fatalities. Clearly, a younger population (age less than 30 years) is in the majority. In reviewing these cases, 21 victims (91.3%) were male and two (8.7%) female; 12 victims (52.2%) were white and 11 (47.8%) black. In 22 cases (95.7%) the cause of death was drowning, and in one case (4.3%) it was multiple blunt impact injuries.

Toxicologically, the blood alcohol content at autopsy was not ascertained in six cases (26%), negative in five cases (22%), between 0.01% and 0.1% in seven cases (30.4%), and 0.1% or more in five cases (21.7%). The Urine EMIT drug screen at autopsy was not ascertained in 11 cases (47.8%) and negative for drugs of abuse in eight cases (34.8%). It was positive in four cases (17.4%). Specifically, it was positive for methaqualone in one case, for cocaine in two cases, and for a combination of benzodiazepines and benzoylceognine in one case.

In analyzing the scene circumstances, the time of the occurrence was unknown in seven cases (30.4%), occurred in the morning in one case (4.3%) and in the afternoon in 15 cases (65.2%). The geographic locale of the terminal incident was the Atlantic Ocean in eight cases (34.8%), a canal in six cases (26.1%), a lake in four cases (17.4%), Biscayne Bay in four cases (17.4%), and a river in one case (4.3%).

Table 1. Age distribution of the victims of boating accidents

Age (yr)	No. of cases	Percentage
0-15	3	13.0
16-20	2	8.7
21-25	3	13.0
26-30	6	26.0
31-35	1	4.3
36-40	2	8.7
41-45	1	4.3
46-50	2	8.7
51-55	1	4.3
56-60	1	4.3
61-65	0	0.0
Over 65	0	0.0
Unknown (estimated 20-30)	1	4.3

Table 2. Type of boat involved in fatalities

Type of boat	No. of fatalities	Percentage
25-35 feet wooden sailing ship	6	26.1
"Day Sailor" boat (i.e., boat without overnight accommodation, e.g., 16 feet boat with 175 horsepower outboard engine)	5	21.7
"Shallow water fishing" boat (e.g., 12 feet 'V' hull aluminium boat, 12 feet 'open' boat, 11 feet 10 inch 'john' boat with 9.9 horsepower engine)	4	17.4
Canoe (10-12 feet)	3	13.0
"Fishing and Waterskiing" boat (e.g., 23-24.5 feet 'Weelcraft' open fisherman)	2	8.7
Speedboat, 42 feet	1	4.3
Sailboat, not otherwise specified	1	4.3
Small boat, not otherwise specified	1	4.3

Table 2 gives the types of boats involved in these fatalities. "Shallow water fishing boats," "Day sailors" (i.e., those boats without overnight accommodations), and canoes were frequent. The entry of "wood sailing ship" refers to a single incident of many Haitian people attempting to emigrate from Haiti to the USA, which is less common than other daily scenarios.

Table 3 gives the terminal scenario for these fatalities. Both pleasure rides in motorboats and canoe's capsizing are frequent. The Haitian emigration experience is also frequent. Table 4 gives the reason for the fatality which this writer could assign from a careful review of police reports, insurance claims,

Table 3. Scene circumstances of the boating fatalities

Scenario	No. of cases	Percentage
Haitian people emigrating from Haiti to USA, boat sunk enroute	6	26.1
Canoe capsized, either by overloading or inexperience, victim drowned with or without friends' help	6	26.1
Victim went for pleasure ride, speeding, hit piling, thrown out of boat; or, while boating hit depth marker, thrown out of boat	5	21.7
Victim went fishing, either engine stopped, boat capsized in rough seas, or while sailing boat capsized; victim then tried to swim to shore, drowned	3	13.0
Victim went fishing or boating; attempted to repair motor, shift in weight, capsized	2	8.7
Another vessel came close by, victim panicked, jumped overboard	1	4.3
Boat exploded, "flash" fire, victim jumped overboard	1	4.3

Table 4. Reason (risk factor) for the boating fatalities

Reason	No. of cases	Percentage
Inexperience/stupidity	9	39.1
Speeding	4	17.4
Ethanol drinking	3	13.0
Boat overload	2	8.7
Vessel traveled too close to another vessel	1	4.3
Obscured vision in dark	1	4.3
No life preserver	1	4.3
Weather	1	4.3
Unknown	1	4.3

newspaper clippings, and the Medical Examiner's Office investigative report. Commonly, inexperience, speeding, and alcohol use are frequent reasons for fatalities.

Truly, much information is available in the case files of the Office of the Medical Examiner of Metropolitan Dade County in Miami, Fla.

Discussion

Accidental boating fatalities are rare. These 23 cases comprise 1.3% of the 1,765 non-vehicular accidental fatalities which occurred in Metropolitan Dade

County during the 5-year period from 1980 to 1984. This is surprising given the 43,000 pleasure craft and 1,400 commercial vessels that exist in Metropolitan Dade County. However, even if rare, it is still useful to study these deaths for there are implications to forensic pathologists and to the public for water transport safety.

The implications of these fatalities center on the reasons for these tragedies. In reviewing these cases, as Tables 3 and 4 indicate, human error, inexperience in boating, and ethanol use are the critical risk factors. It should be pointed out to the reader that in Metropolitan Dade County, currently, *no* operational licensing of boat operators is required.

Furthermore, no water safety or boating instruction classes are required before purchase or operation of a boat. Tragically, one can purchase a boat with an improperly sized engine (cf. Table 3) or even operate a boat with life jackets not readily accessible (cf. Table 3). It is amazing, therefore, that not more deaths do occur from boating. The reason for this may well be that the 43,000 boat owners do not use their boats on a regular basis. It appears that boating is more of a one time or "novelty" experience for most boat owners. Obviously, to prevent these few tragedies that do occur, one must invoke either a licensing system predicated on ability to operate a boat or a mandatory water safety/boating operation instruction prior to usage. Truly, such tragedies could be prevented if enough safeguards we established legally.

As compared to other accidental fatalities [5–8], boating deaths share a common theme a youth, alcohol, and stupidity. Similarly, a white male preponderance among the victims is noted in other recreational accidental deaths [5], accidental gunshot fatalities [6], teenage deaths [7], and in accidental fire deaths [8]. It may well behoove society to direct a public education campaign as to the hazards of poor judgement and alcohol to this group of individuals to prevent further tragedy.

The forensic pathologist can play a very useful role in enacting legislation to reduce such fatalities. This future work, as an "advocate for the public good", is appropriate for the forensic pathologist, who has firsthand knowledge of these deaths. This writer encourages scientists in other geographic locales to write concerning their experience with accidents among youth and boating fatalities specifically. Furthermore, whatever experience the readership may have had with enacting safety regulations would also be enjoined.

Conclusion

In final summary, a 5-year study of boating fatalities is presented in this article. While rare, these cases are tragic in that the reasons for them are due to inexperience in boating, human error, or alcohol use. It behooves society to enact legislation that would require operational licensing or water safety instruction prior to purchase or usage of a boat. Forensic pathologists are in a unique role to function as an "advocate for the public good" in such cases and to establish laws that safeguard the population, specifically the youth of society.

References

1. O'Donnell B (1980) The fastnet race 1979. *Br Med J* 281:1665-1667
2. Environmental Services Division, Center for Disease Control (1982) Aquatic deaths and injuries - United States. *CDC Morbidity and Mortality Weekly Report* 31:417-418
3. Barancik J, Chatterjee B, Greene Y, Michenzi E, Fife D (1983) Northeastern Ohio trauma study: I. Magnitude of the problem. *Am J Public Health* 73:746-751
4. Dade County Tax Collectors Office, Auto "Tag" Agency, Accounting Division. Personal communication, January 1986
5. Copeland AR (1984) Deaths during recreational activity. *Forensic Sci International* 25:117-122
6. Copeland AR (1984) Accidental death by gunshot wound - Fact or fiction. *Forensic Sci International* 26:25-32
7. Copeland AR (1985) Non-vehicular accidents among teenagers - The 5-year Metro Dade County Experience from 1979 to 1983. *Forensic Sci International* 27:221-227
8. Copeland AR (1985) Accidental fire deaths. *Z Rechtsmed* 94:71-79

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