

Final report of completed studies

Near Drowning

Background

Despite public health campaigns, drowning remains the major cause of accidental death in children under five years of age in Australia, accounting for three to four deaths per 100 000 children under five. Toddlers are at most risk. The majority of deaths occur in the home and most are thought to be preventable. A systematic review has confirmed that pool fencing significantly reduces the risk of drowning in childhood and that isolation fencing is superior to three-sided fencing. However fencing legislation varies throughout Australia.

Near-drowning rates in Australia have never been accurately determined due to constraints in gathering national data and the lack of a national database that includes near-drowning cases. Estimates of the magnitude of the problem vary considerably. APSU was thus used to obtain prospective national data on children with near-drowning whom present to a paediatrician or paediatric hospital in Australia. APSU will not identify children seen by general practitioners, by adult accident and emergency departments, or those who do not seek medical attention. Data is presented for the three year period, January 1994-December 1996 inclusive.

Objectives

- To describe the frequency of presentation to a paediatrician of near-drowning in children less than five years of age in Australia
- To document the circumstances surrounding near-drowning episodes including the geographic location, site, and use of preventative measures such as pool fencing
- To identify high risk groups within this population
- To determine short term outcome

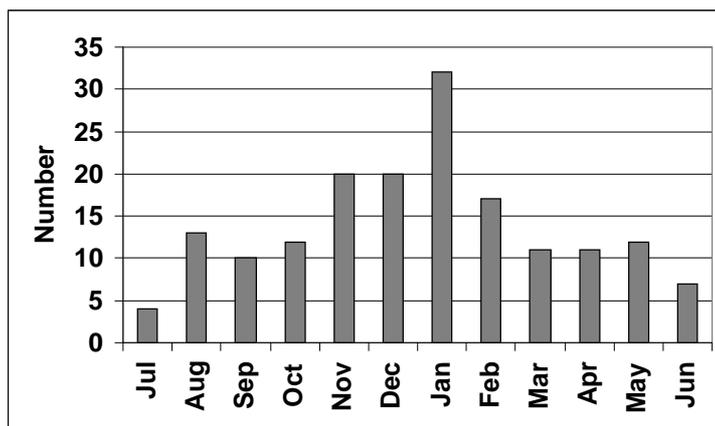
Case definition

Any child under 5 years of age seen in the previous month as a result of a near-drowning incident involving immersion of the child in any body of water (eg. swimming pool, dam, river, bath, ocean, nappy bucket

Results and discussion

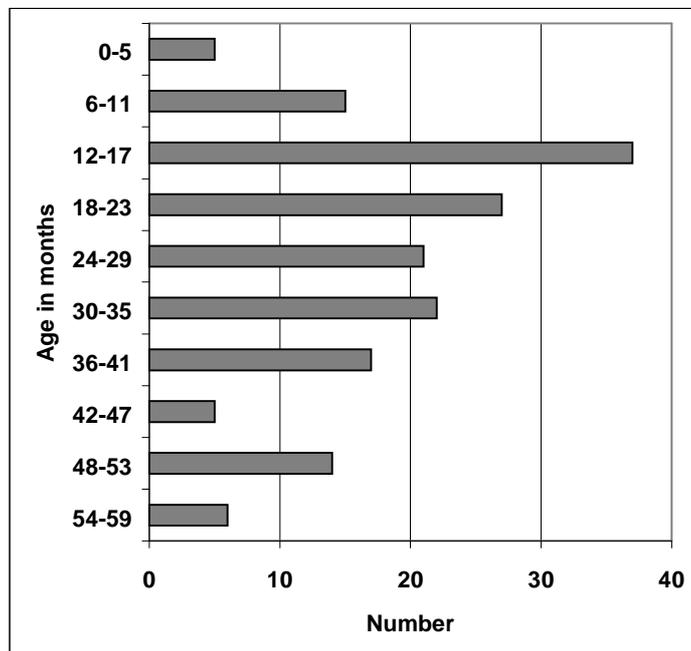
Between January 1994-December 1996 inclusive, 169 cases of near drowning were identified, giving a minimum annual incidence of 4.3/100 000 children < 5 years and 5.5/100 000 < 3 years. Most (53%) cases occurred in summer .

Figure 7 Seasonal distribution of near-drownings, 1994-1996 (n=169)



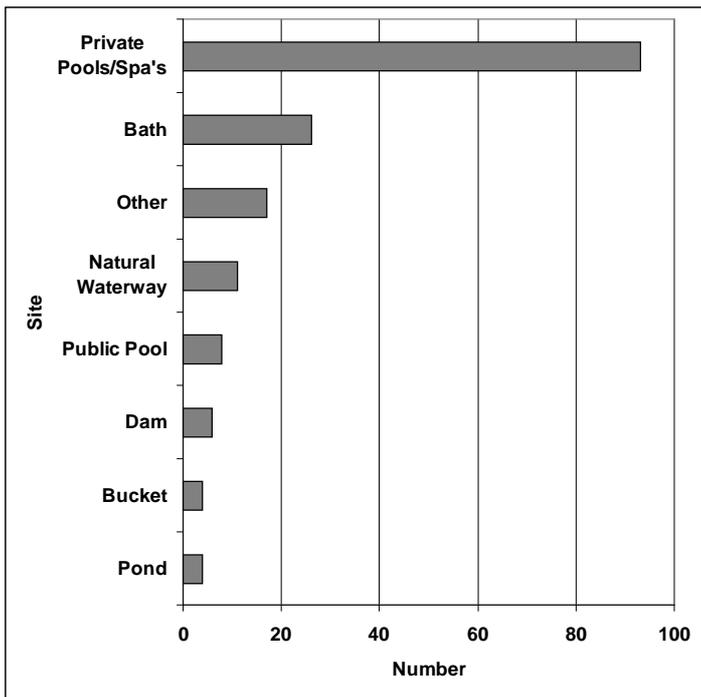
There was a significant seasonal trend (χ^2 analysis, $P < 0.0001$) (Figure 7). Despite a wide variation in state incidence (from 0.98/100 000 in TAS to 17.2 in NT), the overall incidence did not vary significantly between states and territories. However, the incidence was significantly higher in the NT than in Qld, WA, NSW, VIC and TAS. Similarly, incidence was higher in Qld than in NSW, VIC, and TAS.

Figure 8 Age distribution of near-drownings, 1994-1996 (n=169)



The mean (SD) age was 26 (13) months and 19% cases occurred between 12-17 months (Figure 8). Thirty-eight percent of cases occurred in the second year of life. The male:female ratio was 1.6:1. The majority (82%) of near-drownings occurred in the home in private swimming pools or spas (55%) and baths (17%) (Figure 9).

Figure 9 Site of Near-drownings, 1994-1996
(n=169)



Children who nearly drowned in the home were significantly younger than those who nearly drowned outside the home in a natural waterway, public pool or other site. Children nearly drowning in baths were significantly younger than those nearly drowning in pools. In many cases, children were left unattended in the bath, often with another child under the age of five.

Where information was available on fencing, 57% of pools were isolation fenced and 35% were unfenced. Where pool fencing was in place, children accessed the pool with an adult or another child, via an open or broken gate, through a gap in or under the fence, or by using furniture or a garden item to climb the fence. All children identified required hospital admission and 25 required intensive care. One hundred and fifty seven (93%) children were reported to have recovered fully after the incident, while the remaining 12 (7%) were reported to have sustained neurological damage which was mild in four and severe in eight children.

Conclusion

This, the first prospective national study of near drowning in Australia, highlights the significant risk of near-drowning for children under five and particularly for the toddler in the home. The cases identified represent those seen by a paediatrician. Seven percent of these had some degree of neurological impairment following the near-drowning episode. The incidence derived from this study is likely to be an underestimate of the problem in Australia, due both to the fact that some children will present to general practitioners and adult emergency departments and to the incomplete

questionnaire return rate. The study highlights the high burden of this condition, particularly in the NT. Lack of supervision was identified as a major contributor to near-drowning in most cases, suggesting the need for further community education. Review of pool fencing legislation and the methods used to enforce legislation and ensure maintenance of gates and fences is also warranted. Consideration should be given to training all parents, carers and pool owners in life support. Long term cohort studies are required to determine the real impact of near-drowning on the neurological and psycho-social development for survivors.

Investigators

Mr Frank Ross, (Principle Investigator) Clinical Nurse Consultant, Trauma Research Unit, New Children's Hospital, PO Box 3515, Parramatta NSW 2124 Ph: 02 9845 Fax: 02 9845 3082

Associate Professor Elizabeth Elliott, Department of Paediatrics and Child Health, University of Sydney; Consultant Paediatrician, New Children's Hospital, PO Box 3515, Parramatta NSW 2124

Mr Lawrence Lam Research Officer, Trauma Research Unit, New Children's Hospital, PO Box 3515, Parramatta NSW 2124

Professor Daniel Cass, Head, Department of Surgery, New Children's Hospital, PO Box 3515, Parramatta NSW 2124

We acknowledge the contribution made by Dr Victor Carey, Dr Robert Pitt and Professor Graeme Vimpani for development of the original study application and questionnaire.