

Drowning of babies in bath seats: do they provide false reassurance?

J. Sibert,* N. John,* D. Jenkins,† M. Mann,‡ V. Sumner,§ A. Kemp* and P. Cornall¶

*Department of Child Health, Cardiff University, Penarth, UK

†Product Safety Department, Royal Society for Prevention of Accidents, Birmingham, UK

‡Information Department, Cardiff University, Cardiff, UK

§Life Saving Support, The Royal Life Saving Society (UK), Broom, Warwickshire, UK and

¶Water and Leisure Department, Royal Society for Prevention of Accidents, Birmingham, UK

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Abstract

Aims To investigate the problem of children drowning in bath seats by examining case reports, by looking at the epidemiology of bath drowning in children under two years of age and by reviewing the literature.

Methods We describe two babies: one who drowned and one nearly drowned in the bath whilst in a bath seat. We examined the RoSPA/RLSS UK database of cases of children under two years drowning in the bath for the years 1989–2003. Cases are ascertained through a press cutting system. We conducted an all language literature search of original articles, references, textbooks and conference abstracts 1951 – October 2004 in 11 standard databases.

Results The two cases illustrate how parents can have a false sense of security with bath seats. We found six cases of babies under two years drowning in the UK associated with bath seats in the time period 1989–2003. They were all boys: five of the six were under one year of age. This compared with 47 children of similar age drowning in the bath not associated with a bath seat. The literature is sparse with only four papers since 1966.

Discussion A baby drowning after being placed in a bath seats is a rare but definite cause of death. Bath seats appear to give a false sense of security (even if not encouraged by the manufacturers). It is unclear whether putting a baby in a bath seat represents an increased risk of drowning compared with a baby without a seat. Without knowing the numbers of mothers that use bath seats it is difficult to come to firm conclusions on the risks to babies. New research is needed to clarify this issue. Whether in a seat or not it is clear that the main risk to babies in the bath is being left unsupervised.

Introduction

Bath drowning is a well-recognized cause of death in childhood. In the two years 1988–1989, 25 children (0–14 years) drowned in the UK in the bath (Kemp & Sibert 1992): the same number as in 1998–1999 (Sibert *et al.* 2002). The key issue is the developmental stage of the child and it

appears that most of the babies who drown are at a developmental stage where they can sit up unsupported but are unable to right themselves if they fall over in the water: thus drowning. The older children who drown in the bath may have either learning difficulties or drown during a fit (Kemp & Sibert 1993) thus being in the same situation as a baby: being unable to right themselves

Correspondence:
Jonathan Sibert, Cardiff
University, Child Health
Academic Centre, Llandough
Hospital, Penarth, Wales
CF64 2XX, UK
E-mail: sibert@cf.ac.uk

having fallen into the water. Child abuse is also a differential diagnosis (Kemp *et al.* 1994). Bath Seats have been introduced as an aid to support children in a seated position, in the bath. There are few estimates on their usage either in the UK or the USA. We hoped to answer the research questions of how common drowning of babies in bath seats is, do they give a false sense of security and are babies sitting in bath seats at increased risk of drowning? This paper reports two cases of bathtub drowning (one fatal and one resulting in severe brain damage) to illustrate the problem. It uses the Royal Society for Prevention of Accidents/Royal Life Saving Society (RoSPA/RLSS UK) press-cutting database to estimate how common the problem is in the UK. It also reviews the literature to give evidence on how common the problem is worldwide and the preventive solutions that have been proposed in Europe and in America.

Methods

One of us (J.R.S.) was asked by two Police forces in different parts of the UK to provide reports on two babies: one of whom drowned and one nearly drowned in the bath. We describe these cases.

We examined the RoSPA/RLSS UK database of cases of children under two years drowning in the bath for the years 1989–2003. Cases are ascertained through a press-cutting system: this has proved a valuable system that ascertains the majority of childhood drowning deaths (Kemp & Sibert 1992; Sibert *et al.* 2002). It provides useful details of the drowning episode: unobtainable from the Office of National Statistics. We chose to study children under two years of age because bath drowning is prevalent in this age group and because we had previously shown that cases over that age were often associated with epilepsy, learning difficulties or abuse (Kemp *et al.* 1994).

We also conducted an all-language literature search of original articles, references, textbooks and conference abstracts 1951 – October 2004: ASSIA (1987-), Caredata (1986-), Child Data (1996-), CINAHL (1982-), Embase (1980-), ISI Proceedings (1990-), Medline (1951-), Science Citation Index Expanded (1981-), SIGLE (1980-),

Social Science Citation Index (1981-), and TRIP+ (1987-) databases.

We used the keywords: baby, babies, infant, infants, drown, drowning, near-drowning, submersion, immersion, bath seat, bathtub, bucket bath, infant equipment. In addition we performed an Internet Search on Google: 'Bath seats' and infants.

Case reports

Case 1

A 10-month-old boy was put in the bath with his twin sister in bath seats. They were supplied with a warning that they are not a safety aid. The mother stated that she fixed the seats with the suction pads and ran the water in the bath. She also put toys in the bath. She put the twins in the bath and in their seats and played with them for about 5 min. She then left the children and did various normal tasks hearing the children playing. She then realized everything went quiet and she went upstairs and saw the boy who was completely covered with water. The Ambulance was called but he was unable to be resuscitated. Post-mortem showed the cause of death as drowning. There were no signs of neglect and no fractures on skeletal survey.

Case 2

An 11-month-old boy was put in the bath with his older brother. The younger boy was in a bath seat, which was secured to the base of the bath by suckers on the bottom of the seat. The mother said she left the children for 1 or 2 min to get towels and when she returned the younger boy was face down in the water. The ambulance attempted to revive the boy and, on arrival at Hospital, he was found to be asystolic and was given cardio-pulmonary resuscitation, intubation and ventilation. He was thought to be asystolic for 15 min. He was transferred to a paediatric intensive care unit (PICU) but he has remained severely brain damaged.

Results from RoSPA/RLSS UK database

We examined the RoSPA/RLSS UK database of cases of children under two years of age drowning

in the bath for the years 1989–2003 in the UK. We found six cases associated with bath seats (including Case 1) (Table 1). They were all boys: five of the six were under one year of age (the age of the sixth case was between one and two years). Therefore, approximately one child every other year drowns in a bath seat in the UK. This compared with 47 children under two years drowning in the bath not associated with a bath seat. All the babies in bath seats and the vast majority of babies drowning not in bath seats were unsupervised at the time.

Results from literature search

We found only four scientific papers and one report in our literature search on bath seat drownings (Christensen & Lange 1989; Rauchschalbe *et al.* 1997; Consumer Product Safety Commission 2001; Thompson 2003; Byard & Donald 2004) (See Table 2). The paper by Rauchschalbe and colleagues (1997) was a cross-sectional study based on data from Consumer Product Safety Commission (CPSC) in the USA from the years 1983–1995. The information from the CPSC (2001) was brought

together by the Commission itself as part of the response to a petition to ban bath seats for infants. This extended the time period quoted by Rauchschalbe *et al.* 1997) to 2001 and also extended the age range slightly. The paper by Thompson (2003) also used data from the CPSC but in addition used data from the National Centre for Health Statistics (NCHS). The age range in this study was limited to 6 to 10 months. The other papers were a case series from South Australia (Byard & Donald 2004) and a case report from Denmark (Christensen & Lange 1989).

This report from the CPSC (2001) presents a great deal of data from their database on 78 deaths and 110 near drownings over an 18-year-time period. The modal age of the cases was 7 months (22 out of 78 cases). Seventy-five of the 78 cases had been left on their own before the drowning. The report describes several hazard scenarios including: the seat falling over (24 fatalities – 56 non-fatal incidents), infant out of seat (14 fatalities – 8 non-fatal incidents), entrapment and submersion (3 fatalities – 15 non-fatal incidents), infant slumped over bath seat (8 fatalities – 2 non-fatal incidents), overflowing water (2 fatalities – 1 non-

Table 1. Numbers of children under two years drowning in the bath in the UK (from RoSPA/RLSS UK database)

Age band and sex	Total drowning deaths not associated with bath seat	Drowning deaths associated with bath seat
Boy under 1 years	12	5
Boy between 1 and 2 years	17	1
Girl under 1 year	11	0
Girl between 1 and 2 years	7	0
Total	47	6

RoSPA, Royal Society for Prevention of Accidents.

Table 2. Table of references

Paper	Source of data	Years covered	Age range (months)	Numbers of drownings	Near drownings
Christensen and Lange (1989)	Clinical case report Denmark	1989	8	Not studied	1
Rauchschalbe and colleagues (1997)*	CPSC	1983–1995	5–15	32	Not studied
Thompson (2003)*	CPSC/National Centre for Health Statistics	1994–1998	6–10	40	Not studied
CPSC (2001)	CPSC	1983–2001	5–20	78	110
Byard and Donald 2004)	Notes of the Forensic Science Centre and Child Protection Unit of the Women's and Children's Hospital Adelaide, South Australia	1998–2003	7–8	1	2

*These papers use information from the same dataset as the CPSC Report. CPSC, Consumer Product Safety Commission.

fatal incident), bath seat breaking (11 cases), and no mechanism determined (27 fatalities – 17 non-fatal incidents). The report details a study by Dr N Clay Mann (which does not appear to have been published elsewhere). He details a significantly higher water level in drowning deaths with seats than without seats.

Only one paper considered exposure of children to bath seats. Thompson (2004) reviewed data for the years 1994–1998. She found 40 deaths of babies 6–10 months associated with bath seats, this compared with 78 not associated with bath seats. She used figures given by the American Baby Group to suggest that approximately 45% of infants in this age group use bath seats and concludes that the existing data do not support a hypothesis that bath seats increase the risk of bathtub drowning for infants.

Discussion

A baby drowning after being placed in a bath seat is a rare but definite cause of death in the UK, with approximately one baby dying every other year. There clearly also are children who are brain damaged such as Case 2. The figures from the USA suggest that between four and five children drown each year in bath seats in their population.

We know of no evidence that bath seats for babies have been sold by any manufacturer as a preventive method for drowning. Nor is there evidence in these two cases that the bath seats were in any way defective. Nevertheless they gave a false sense of security (even if not encouraged by the manufacturers) to both these mothers with very sad consequences. It is clear that babies that can sit but cannot right themselves are at risk from drowning if left alone in a bath seat. There must be concern regarding their use.

The concern regarding these seats has been recognized by both the CPSC in the USA and in the European Union but there are different approaches in prevention. In America there was a petition in 2000 to the CPSC for bath seats to be banned (Consumer Federation of America 2000; Consumer Product Safety Commission 2001). However, in October 2003, the CPSC voted unanimously not to ban the seats but to propose a federal mandatory

standard (Consumer Product Safety Commission 2003; Hayes 2004). The standard will address the problems of the seats tipping over, slipping through the leg openings and becoming trapped and children climbing out of the seat. There will also be a safety warning: 'children have drowned in bath seats; this bathing aid is not a safety device; always keep a baby at arm's reach'. In Europe, the Committee charged with safety of child care articles (CAPT News 2004) have decided that it cannot prepare a standard that will provide adequate levels of safety and is considering advising a ban on the bath seats.

Nevertheless, it is unclear whether putting a baby in a bath seat represents an increased risk of drowning compared being in the bath without a seat. Thompson (2003) in the USA, who quotes the only exposure figures in the literature, thinks the risk is not increased but may be smaller. We have only anecdotal evidence on exposure in the UK; however, informal information from the retail sector suggests that approximately 200 000 units may be sold per year in the UK. If the usage of bath seats in babies goes along with this figure bath seats would probably not represent an increased risk; however, without knowing firm figures for bath seats usage it is very difficult to come to firm conclusions. New research is needed to clarify this issue.

Whether in a bath seat or not it is clear that the main risk to babies in the bath is being left unsupervised. Simon and colleagues (2003) have reported that 17% of children under two and 15% of children under one have been left unsupervised at bath time: so the problem may be greater than generally appreciated.

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