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Poisoning, Burns, and Other Accidents Experienced By a Thousand Dunedin Three Year Olds: A Report from the Dunedin Multidisciplinary Child Development Study

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SUMMARY

Poisoning, burns, and other accidents experienced by 1037 Dunedin children during their first three years of life are described. 7.8 percent of the children ingested poison, 4.9 percent were burned, and 21.4 percent experienced other accidents for which medical advice was sought. The children who had been poisoned were of significantly lower intelligence than the remainder although those who had had other accidents did not differ significantly in this respect. The mothers of children poisoned or who had had accidents were not significantly different from the remainder in terms of general mental ability or training in child development.

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INTRODUCTION

Despite the efforts of the Department of Health, the Plunket Society, and others in public education programmes, poisoning, burns, and other accidents remain a serious problem in this country. This has been pointed out by three New Zealand workers (Meade, 1963; Holdaway, 1972, Allingham, 1975) who have each highlighted the importance of the problem, outlined some of the correlates, and recommended better preventive education.

This study restates the problem and gives figures relating to the prevalence of poisoning, burns, and other accidents. This is followed by an analysis of some characteristics of the children and the mothers involved. Finally, recommendations regarding prevention are made.

METHOD

Subjects. The sample consisted of 1037 three-year-old children and their mothers drawn from all surviving metropolitan infants who were born at Dunedin's one maternity hospital (Queen Mary) between 1 April 1972 and 31 March 1973. During the 12-month period a total of 1661 live born infants survived the neonatal period. Of these, 12 (0.78 percent) died between 28 days and three years, 510 (30.7 percent) were known or believed to have moved beyond Dunedin city. Thirty-four (2 percent) were traced too late for inclusion in the study sample and 68 (4.1 percent) were unable to attend the examinations for a variety of reasons.

The 1037 three-year-old children studied were compared with the sample not seen to determine if there were any significant differences. There were no significant differences ($P > 0.05$) in maternal antenatal problems, mode of delivery, birth weight, and number of neonatal complications.

Comparison of the socio-economic status of the seen and not seen samples, using the six levels of the Elley, Irving (1972) Index, showed that there were significant differences (Table 1). (Chi Square Goodness of Fit $P<0.001$). In the case of all levels except Level 4, these differences did not exceed 5 percent. Level 4 was markedly over-represented in the seen sample (35 percent as against 22 percent in the unseen sample).

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Finally, the marital status of the mother at the time of the child's birth was examined. 94.6 percent of the seen sample's mothers were married at the time of the child's birth compared with 84.5 percent of the sample of mothers not seen.

The seen sample's socio-economic levels were compared with those of New Zealand and New Zealand urban areas (Elley, Irving, 1972) and this showed the Dunedin sample to be socio-economically advantaged (Table 1).

Table 1.—Socio-economic levels of the samples seen and not seen compared with the percentage of the male labour force in each level for NZ as a whole and for urban areas.

Socio-economic	Seen Sample		Not Seen Sample		NZ	NZ Urban
Level	N	%	N	%	%	%
1	110	10.6	71	11.6	5.8	7.0
2	109	10.5	58	9.5	19.3	12.7
3	149	14.4	71	11.6	13.3	16.8
4	365	35.2	137	22.4	28.2	32.7
5	156	15.0	83	13.6	21.3	23.5
6	52	5.0	37	6.0	12.1	7.3
Students	22	2.1	46	7.5	—	—
Unknown	74	7.1	109	17.8	—	—

Lastly, the Dunedin sample was under-representative of the Maori and other Polynesian races with just 2 percent being half or more of Maori or Polynesian ethnic origin compared with about 10 percent for New Zealand as a whole (New Zealand Year Book, 1976).

Methods of Data Collection: The mothers were interviewed and their children assessed when they were within a month of their third birthdays.

The following questions relating to poisoning or accidents were asked. 1. Has your child ever been accidentally poisoned, ie., sufficient to warrant calling the doctor or resulting in a hospital visit? (If one or more poisonings occurred, the age at each poisoning, the type of poison, and details of treatment were recorded). 2. Has your child ever attended the accident and emergency department of a hospital, any other hospital department or seen a doctor because of an accident necessitating either an x-ray or sutures, or because of a fracture or burn? (If one or more accidents had occurred, additional details on the age at which each accident occurred, a brief description of the nature of the accident, and treatment were recorded.)

In addition to the above descriptive information, the children's intelligence was assessed using the Peabody Picture Vocabulary Test (Dunn, 1965) and also the mothers' general mental ability (Thurstone, Thurstone, 1973) and training in child development (a five point scale, Silva, Fergusson, 1976).

RESULTS

Poisoning

Eighty-one children (7.8 percent) ingested poison for which their parents sought medical advice. Four children took poisons twice and one three times.

Table 2 sets out the ages at which the children were poisoned and the poisons involved.

The Table shows that the most common age for taking poisons was between 19 and 24 months. The Table also shows that medicine accounted for half the poisons taken, the remainder being mainly household cleansers and other chemicals often found around the home.

The medicines were described as valium, amitriptyline, "nerve pills", "sleeping pills", "sedatives", "anti-depressants", "heart pills", steroids, pregamal tablets, laxatives, contraceptive tablets, panadol, epilepsy medication, cough mixture, penbritin, and other medicines of unknown type.

Table 2.—Poisoning during the first three years of life by age in months

Poison	7-12 months	13-18 months	19-24 months	25-30 months	31-36 months	Total
Medicines	0	7	22	7	7	43
Chemicals	3	6	16	6	4	35
Miscellaneous, perfume berries, plants, paint	2	3	1	1	2	9
Totals	5	16	39	14	13	87

Household chemicals include cleansers, "Handy Andy", "Janola", window cleaner, dishwashing liquid, turpentine, kerosene, rat poison, moth balls, camphorated oil, oil of wintergreen, fertiliser, "deep heat cream", and "Epiglass filler". There were seven other chemicals of unknown type. Also, there was a miscellaneous group which included perfume and poisonous berries and plants.

Of the 81 children poisoned, 10 were admitted to hospital, eight of whom stayed overnight only and two for three days.

Burns and Other Accidents

Altogether, 273 children (26.3 percent of the total sample) had experienced 343 accidents necessitating treatment. Forty-one children (4 percent of the total sample) had had two accidents and 12 (1.3 percent) three or more accidents.

Table 3 shows that the 343 accidents were classified as burns (4.9 percent of the total sample), lacerations (9.1 percent), falls or bangs (8.6 percent), fractures (3.2 percent), crushed fingers (2.5 percent), swallows (not poison) (2.1 percent), wringer accidents (0.4 percent), motor vehicle accidents (0.2 percent), and miscellaneous (2.1 percent).

Table 3.—Injuries during the first three years of life by age in months

Type of Accident	Age in Months						
	0-6	7-12	13-18	19-24	25-30	31-36	Total
Burns	0	7	14	11	9	10	51
Lacerations	0	6	10	22	32	24	94
Falls or "bangs"	1	6	15	11	24	32	89
Fractures	2	1	5	7	11	7	33
Crushed fingers	0	3	1	7	8	7	26
Swallows	0	3	6	5	5	3	22
Wringer	0	0	2	1	1	0	4
Motor vehicle	0	0	0	0	1	1	2
Miscellaneous	5	0	4	3	4	6	22
Totals	8	26	57	67	95	90	343

Thirty-seven of the accidents resulted in a hospital admission for a night or more and 11 of these were for burns.

Of the total number of hospital admissions for the sample during the first three years of life, one in five followed an accident or poisoning. Of all the consultations that children had had with doctors in the month prior to age three, 7 percent were for treatment of an injury or as a result of poisoning.

Characteristics of Children Who Were and Who Were Not Poisoned and of Their Mothers. There were no significant sex differences. The children's intelligence, their mothers' general mental ability, and training in child development were compared. Only those for whom all the relevant measures were available were included. Differences between means were tested for significance using analysis of variance.

The poisoned group were of slightly lower intelligence and the difference was statistically significant ($P < 0.01$). There were no differences between the poisoned and non-poisoned in maternal general mental ability or training in child development.

Characteristics of Children Who Had Accidents, and of Their Mothers. There were no significant sex differences between children who had accidents and the remainder.

Children were grouped according to whether they had had no accidents, one accident, or two or more accidents. Members of groups for whom all the information was available were then compared on the measure of child intelligence, maternal general mental ability, and training in child development. Again, differences between means were tested for significance using analysis of variance.

There were no statistically significant differences between any of the groups on any of the measures.

DISCUSSION

Poisoning

This study confirmed that poisoning continues to be a major problem of childhood with almost 8 percent of the present sample having been poisoned in their first three years of life. Other studies (Meade, 1963; Holdaway, 1973; Allingham, 1975; Shaw, 1977) suggest that some of these children will be poisoned between three and five years of age.

Medicines were involved in about half of the poisoning incidents. It is of interest to compare the percentage of medicines reported in other NZ studies: Allingham (1975), 38 percent; Holdaway (1973), 38 percent; Meade (1963), 43 percent; and Shaw (1976) 46 percent.

Although the poisoned children were slightly below average in intelligence, the difference was not large. The mothers of poisoned and non-poisoned children did not differ in general mental ability or training in child development. There was no evidence from this study that enables the blame to be placed on any level of maternal competence or section of the community. All children are at risk of being poisoned.

The common feature in all poisoning of children is the availability of the poisons. Poisons should be locked away immediately after use where children and babies cannot get to them. Although the peak age for poisoning was between 18 and 24 months, some children were poisoned before their first birthdays. If medicines and household chemicals (cleansers and the like) were not available, the child poisoning rate would be dramatically reduced.

Constant and on-going public education programmes are necessary to remind people of the danger of poisons. The need for safe storage of poisons should be emphasised. Also, the need to remind people to return poisons to their proper storage place is emphasised. Allingham (1975) found that 60 percent of child poisonings involved substances that were not in their usual storage place.

Burns and Other Accidents

Burns or other accidents affected more than one in every four children before the age of three years and there was evidence of increasing accidents with increasing age.

The intelligence of the children and the general mental ability or training in child development of mothers of children who had accidents did not discriminate between the groups. It is reasonable to assume that all children from all families are at risk of having an accident.

More than half the burns were a result of being scalded by water, from a hot water jug, hot drinks, or hot baths. Next most dangerous were heaters, followed less frequently by open fires. A wide variety of other hot things burned the children including ovens, ashes, car exhaust pipes, motor mowers, hot taps, and a faulty electric plug. Availability and accessability of hot things led to burns. Close supervision of children in the proximity of hot things, or safe placement of such dangerous objects as hot water jugs (eg., safety holders, short cords) would prevent a large proportion of burns. All fires or heaters need to be suitably protected.

The remainder of the accidents were the result of a large number of misadventures. In the majority of cases, the accident was a result of a fall off something, onto something, or a fall while running.

In less than a quarter of the cases were accidents due to the availability of dangerous objects. The exceptions were the burns, wringer accidents, and injuries due to sharp objects such as glass, knives, scissors, light bulbs, nails, pins, and fish hooks. Surprisingly, doors were the most common hazard and these included a variety of house doors and vehicle doors accounting for numerous crushed fingers. Animals were responsible for only two accidents. In one case a dog bit a child and in the other a horse stood on a child's foot.

Examination of the circumstances surrounding accidents suggests that, apart from keeping hot or sharp objects away from children, there are no recommendations that can be made that would substantially reduce the accident rate. Children need to explore their environment and this sometimes involves a certain amount of risk. There is no obvious way in which a young child can be prevented from occasionally climbing on furniture or running about his back garden. Perhaps the best that can be recommended is that parents can be constantly reminded of potential dangers and that sensible supervision and the removal of obvious hazards is necessary to prevent accidents.

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