QUEENSLAND INJURY SURVEILLANCE UNIT

INJURY BULLETIN

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Childhood Poisoning and Ingestion

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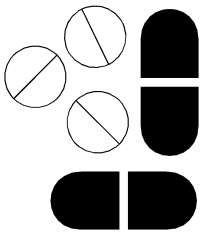
Summary

- 1516 children (0-14 years) presented to QISU hospital emergency departments following an ingestion or poisoning event, during 1998 and 1999
- 35% of the presentations were admitted to hospital
- Children were admitted to hospital more than twice as frequently in regional areas compared to Brisbane
- Almost nine out of ten of the presentations were to children aged less than five.
- Almost 60% of child poisoning cases involved medications, most commonly paracetamol
- 60% of female and 13% of male presentations in the 10-14 years age group were intentional self-harm

Introduction



Childhood poisoning is one of the most common reasons for presentation at hospital emergency departments in Australia. For children aged under five poisoning is the third most common reason for presentation (after falls and struck by or collision with object) and the second most common reason for admission to hospital (after falls).

Unintentional poisoning in children rarely results in a fatality, with only six child poisoning deaths being recorded in Queensland in the last six years however it is still a major cause of ill health in young children[1].

While the rate of childhood poisoning deaths have declined dramatically since before the

* QISU data is based on emergency department presentations to the following hospitals: Mater Children's Hospital, Mater Adult Hospital, Mater Private Emergency Care Centre, Queen Elizabeth II Jubilee Hospital, Redland Hospital, Logan Hospital, Royal Children's Hospital, Mt Isa Hospital, Mackay Base Hospital , Proserpine Hospital, Sarina Hospital, Clermont Hospital, Dysart Hospital and Moranbah Hospital

1980s there has been little change in the rate of presentation to hospital emergency departments [2,3,4]. The small number of childhood poisoning deaths observed in recent years has largely been attributed to changes in the toxicity of chemicals used around the house and changes in packaging, labelling and storage of poisonous substances. The importance of childhood poisoning is reflected in it being identified as a priority area in *Better Health Outcomes for Australians* and in the draft *National Injury Prevention Action Plan: Priorities for 2000-2002* [5,6].

This bulletin examines the circumstances surrounding poisoning related presentations to hospital emergency departments in Queensland by children aged less than 15 years.

Results

During 1998 and 1999 the Queensland Injury Surveillance Unit collected data on 1516 poisoning related emergency department presentations to participating hospitals* (listed page 1); representing 4% of all child injury presentations. The overall rate of presentation for childhood poisoning was 265 per 100,000 (Table 1).

Across QISU Regions the presentation rates for South Brisbane and Mackay were similar while the rate for Mt Isa was more than 50% higher (Table 2).

Age and Gender

Almost nine out of ten child poisoning presentations involved a child aged under five years with there being more male cases in all age groups except ten to fourteen years (Figure 1). The lowest number of poisoning presentations was observed in children aged five to nine years. The presentation rate for child poisoning within QISU Regions ranged from 715 per 100,000 for males aged less than five years to 27 per 100,000 for females aged five to nine (Table 1).

Toxin

Nearly 60% of child poisoning cases involved some type of medication while 17% involved common household chemicals. Amongst the medications paracetamol was the most common agent involved (14%) followed by antihistamines and cough and cold preparations (7%). Plants were involved in 5% of cases the most common plant ingested being oleander. Five percent of ingestions involved essential oils including eucalyptus and melaleuca (tea tree) oils. The top 35 toxins involved are given in Table 6.

Within age groups the pattern of toxins involved varied. At the youngest age group (0 to 4) poisoning mainly involved medications and chemicals, while at the next age group (5 to 9) chemicals were more often involved. In the ten to fourteen years age group medications and recreational drugs were the agents most often involved (Table 5).

Location

Not unexpectedly almost all child poisonings took place in the home (93%). Within the home the most common room for the poisoning to occur

(Continued on page 5)

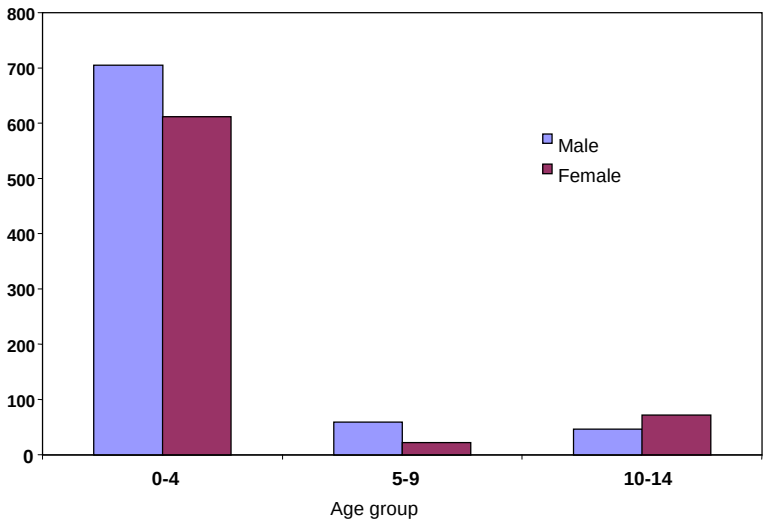


Figure 1 Emergency Department presentation for childhood poisoning by age and gender, 1998-1999

Age group	Males	Females	Persons
0 to 4 Years	715	664	690
5 to 9 Years	53	27	40
10 to 14 Years	45	91	67
0 to 14 years	**270**	**259**	**265**

Table 1: Emergency department presentation rates (per 100,000 Person Years)for poisoning by age and gender, QISU Regions 1998-1999

Region	Males	Females	Persons
South Brisbane	272	257	265
Mackay	221	246	233
Mt Isa	456	343	402

Table 2: Emergency department presentation rates (per 100,000 Person Years) for poisoning by QISU Region and gender 1998-1999

Age group	Males	Females	Persons
0 to 4 Years	34%	34%	34%
5 to 9 Years	44%	27%	40%
10 to 14 Years	37%	46%	42%
0 to 14 years	35%	35%	35%

Table 3: Hospital admission ratios for poisoning by age and gender, QISU Regions 1998-99

Region	Males	Females	Persons
South Brisbane	17%	16%	17%
Mackay	46%	55%	51%
Mt Isa	47%	19%	35%

Table 4: Hospital admission ratios for poisoning by QISU Region and gender, 1998-99

Toxin Class	0-4	5-9	10-14	0-14
Paracetamol	14%	5%	21%	14%
Rodenticide	4%	2%	0%	4%
Pesticide	7%	5%	1%	6%
Chemical	18%	29%	16%	19%
Bleach	2%	2%	0%	2%
Sedative	4%	22%	9%	5%
Antihistamine/Cough-cold preparation	8%	5%	0%	7%
Plant	5%	5%	3%	5%
Iron	0%	0%	0%	0%
Essential Oil	6%	2%	0%	5%
Other Medications and Recreational Drugs	22%	12%	39%	23%
Unknown	10%	12%	10%	11%
Total	100%	100%	100%	100%

Table 5: Emergency department presentations for poisoning by toxin class and age, QISU Regions 1998-99

Toxin	Frequency	%of Total
Paracetamol Liquid	82	5.41
Paracetamol unknown	77	5.08
Rodenticide	69	4.55
Dimetapp	42	2.77
Eucalyptus Oil	39	2.57
Pesticide (unknown)	37	2.44
Chemical (unknown)	37	2.44
Paracetamol tabs	36	2.37
Essential Oil (other)	29	1.91
Plant (unknown)	27	1.78
Mushroom (unknown)	23	1.52
Unknown sedative	19	1.25
Ethanol beverage	16	1.06
Bleach	16	1.06
Temazepam	14	0.92
Diclofenac	14	0.92
Ibuprofen	14	0.92
Petrol	13	0.86
Household cleaner	13	0.86
Melaleuca oil (Tea tree)	13	0.86
Demazin	12	0.79
Turpentine	12	0.79
Thyroxine	12	0.79
Cigarette	12	0.79
Paint/paint thinner	12	0.79
Oleander	12	0.79
Polaramine	11	0.73
Iron	11	0.73
Dexamphetamine	10	0.66
Plant anticholinergic	10	0.66
Insect repellant	10	0.66
Promethazine	9	0.59
Diazepam	9	0.59
Ethanol, nonbeverage	9	0.59

Table 6: Emergency department presentations for childhood poisoning, top 35 toxins, 1998-1999

Place	**0 to 4 years** n (%)	**5 to 9 years** n (%)	**10 to 14 years** n (%)	**0 to 14 years** n (%)
Kitchen	376 (28.5)	28 (34.6)	9 (7.6)	413 (27.2)
Bedroom	283 (21.5)	13 (16.0)	30 (25.4)	326 (21.5)
Bathroom	120 (9.1)	7 (8.6)	7 (5.9)	134 (8.8)
Living/dining room	98 (7.4)	2 (2.5)	10 (8.5)	110 (7.3)
Family room	50 (3.8)	2 (2.5)	2 (1.7)	54 (3.6)
Garage	37 (2.8)	3 (3.7)	7 (5.9)	47 (3.1)
Laundry	39 (3.0)	0 (0)	0 (0)	39 (2.6)
Other interior	120 (9.1)	8 (10.0)	9 (7.6)	137 (9.0)
Garden	76 (5.8)	5 (6.2)	6 (5.1)	87 (5.7)
Other exterior	42 (3.2)	5 (6.2)	13 (11.0)	60 (4.0)
Unspecified	76 (5.8)	8 (9.9)	17 (14.4)	101 (6.7)
Total	**1317 (100)**	**81 (100)**	**118 (100)**	**1516 (100)**

Table 7: Emergency department presentations for childhood poisoning by location and age, 1998-1999

was the kitchen (27%), followed by the bedroom (22%) and bathroom (9%). All age groups followed this pattern except for the ten to fourteen years age group which were much more likely to ingest the poison in the bedroom (Table 7).

Intent

At the younger ages (less than ten) the poisonings were virtually all recorded as being unintended, while in the ten to fourteen years age group 13% of male and 60% of female presentations for poisoning were recorded as being possible or stated self harm.

Outcome

As stated earlier very few child poisonings result in death, however a significant proportion result in admission to hospital. During 1998-99 35% of the child poisoning emergency department presentations resulted in admission to hospital, compared with 16% for all presentations at this age. At different ages the admission rate varied from 27% for males aged five to nine years to 46% for females aged ten to fourteen (Table 3).

Admission rates varied markedly between QISU Regions with only 17% of presentations being admitted in South Brisbane and more than 50% of presentations admitted in Mackay (Table 4).

Discussion

Although the number of child poisoning deaths have declined dramatically over the last 40 years there is little evidence that shows a similar decline in emergency department presentations and hospitalisations, despite the prevention strategies implemented over that period.

Child-resistant packaging for medications and toxic chemical are now almost universally accepted, however it appears that young children may still be accessing these substances at a similar rate. The introduction of child-resistant packaging may have given carers a false sense of security leading to complacency in keeping poisons out of the reach of young children.

It may also be the case that carers are presenting at emergency departments for less serious cases, but if so a corresponding decline in hospitalisations would be expected. The National Health Priority Areas Report on Injury Prevention and Control which documents progress on 20 indicators designed to measure the effect of interventions in injury showed that there is no evidence of any decline in hospitalisations from child poisonings in Australia over the last ten years despite this being one of the stated priority areas[7]. Although the rate of admission for

child poisoning for South Brisbane is now markedly lower than that reported nationally five years ago the rates outside Brisbane are still at a similar level.

The prevention strategies for poisoning in children outlined In the 1994 Commonwealth report *Better Health Outcomes for Australians,* included the development of treatment protocols, including admission criteria for medical practitioners[5]. To date uniform protocols have not been agreed upon and implemented.

The admission rates following presentation for child poisoning reported in this study demonstrate the disparity between regions and hospitals with regard to admission policy. Inappropriate admission of children following ingestion of a poison is an unnecessary burden on the hospital system and has the potential to result in unnecessary anxiety for both the child and their carers.

The high presentation rate for preadolescent females following intentional self poisoning is of concern. Fortunately none of these presentations resulted in a fatality. These incidents are an ideal opportunity for appropriate interventions to prevent repeat attempts. The number of ingestions in the five to nine year age group was unexpected as exploratory or deliberate poisoning is unusual at this age.

The increasing use of essential oils in the community is reflected in the number of presentations for poisoning from these substances seen at emergency departments. Many of these oils are of unknown composition and consequently their toxicity is also unknown. Also there is no requirement for these substances to be packaged with child resistant closures.

Recommendations

- development of treatment protocols to provide a consistent state-wide approach
- assessment and counselling services for ten to fourteen year olds included as a priority as part of treatment protocols
- further study into poisoning in the five to nine year age group
- guidelines for packaging of essential oils and other "natural" therapies
- further research into child resistant closures, including why they fail
- promotion of less toxic chemicals/medications for general household/personal use

References

1 Queensland Council on Obstetric and Paediatric Morbidity and Mortality Unpublished data.
2 Clements FW. Accidental poisoning in childhood. MJA 1956:211-216
3 Pearn J, Nixon J, Ansford A, Corcoran A. Accidental poisoning in childhood: five year urban population study with 15 year analysis of fatality. BMJ 1984; 288: 44-46
4 Pitt WR, Balanda KP, Nixon J. Child injury in Brisbane South 1985-91: implications for future injury surveillance. J Paediatr Child Health 1994; 30: 114-122
5 Commonwealth Department of Human Services and Health. Better Health Outcomes for Australians: National Goals, Targets and Strategies for Better Health Outcomes into the Next Century. Canberra: AGPS. 1994.
6 National Injury Prevention Advisory Council. National Injury Prevention Action Plan: Priorities for 2000-2002. Canberra: Department of Health and Aged Care. 1999.
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ISSN 1442-1917

Prevention

Children under five years of age are most at risk of poisoning, particularly one to two year olds. At this developmental stage they are generally highly mobile and inquisitive, and imitate adult behaviour.

It is particularly important not to refer to tablets as lollies, and to avoid taking tablets in front of babies and toddlers.

General safety tips:

- keep medications in a child resistant cupboard
- medications kept in the refrigerator can be locked in a container such as a computer disk box
- ensure that household products and chemicals are securely stored and remain in their original containers
- dispose of unwanted household chemicals and medications appropriately
- iron tablets and other "natural" products can be highly dangerous – store them as you would medicines
- carers, visitors and elderly relatives may have dangerous substances accessible to children eg. Tablets in handbags or on bedside tables. Ensure the environment is safe and supervise your child when visiting
- contact the Poisons Information Centre in the case of poisoning or suspected poisoning –phone **131126**
- cigarettes and alcohol are poisonous to children – empty ashtrays and store cigarettes and alcohol safely
- remember that container closures are not child *proof* but child *resistant*

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QISU Web site

www.qisu.qld.gov.au

QISU Data

QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals (acknowledged on page 1) represent three distinct regions of Queensland. QISU publications and data are available on request for research, prevention and education activities.

QISU Injury Bulletin

Injury Bulletin comment or feedback is welcomed and can be directed to: Elizabeth Miles Phone 07 3840 1591 or email lizm@qisu.qld.gov.au

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