

## Accidental Poisoning in Children in Bahrain

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**Background:** Childhood poisoning is a preventable problem with considerable morbidity and mortality. This retrospective study was carried out to describe the epidemiology of accidental poisoning of children with drugs and chemicals in Bahrain.

**Methods:** A 6 years retrospective review of accidental poisoning, 600 children were admitted to paediatric department (Salmaniya Medical Complex). In patient record of 311 patients were available for review. The following information was collected from inpatient records: age, sex, type of toxic, symptomatology, source of poison, time of the year, hospital stay and final outcome.

**Results:** Most cases of poisoning involved children under the age of 4 years (89.3%) and male were slightly predominant. There were two deaths, one from rat poison and the other from orphenadrine ingestion. One hundred and forty six children were symptomatic at presentation. Hydrocarbon was the most frequently ingested substance (39.9%) followed by medicinal product (33.4%) and household detergents (30.6%). Hydrocarbon ingestion occurred mostly in children under the age of 2 years while poisoning with medicinal products was more common in those over the age of 2 years. No seasonal variation in the incidence of poisoning was noted. A slight decline in the incidence of poisoning during the last 3 years of the study was observed. Most cases of poisoning occurred at home. Soft drink bottles and glass tumblers were commonly used for storage of hydrocarbons and medicinal products were often left unsecured within easy reach of young children.

**Conclusion:** Accidental poisoning with medicinal and non medicinal products contribute to significant morbidity and hospital admissions in Bahrain.

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Although the incidence of serious accidental poisoning of children with drugs and chemicals has declined in the developed countries, it remains a global problem and it has continued to be a major cause of considerable morbidity and significant mortality in the developing world<sup>1,2</sup>. Fortunately, the vast majority of presumed poisoning can be managed at home by telephone consultation<sup>5</sup>. Childhood poisoning is preventable as it was evident from previous research which has documented deficiencies of parental knowledge of poisoning prevention measures and their prevention practice<sup>8</sup>. Epidemiological data about the pattern of childhood exposure to drugs and chemicals are needed for successful introduction of interventional programs. No epidemiological data about childhood poisoning in Bahrain is available. This retrospective study was carried out to describe the epidemiology of accidental poisoning of children with drugs and chemicals.

### METHODS

The study was carried out in the paediatric department of Salmaniya Medical Centre. Inpatient records of all the

children under 12 years of age, admitted to the paediatric wards with the diagnosis of accidental poisoning, were reviewed for the period, January 1988 through December 1993. It is the departmental policy to admit every child presenting with a history of accidental poisoning.

Diagnosis of accidental poisoning was based on information from parents, domestic help, siblings and relatives. Physical evidence of injury in and around the mouth and odour of the offending chemical was also taken into account.

The following information was collected from the inpatient records: age, sex, type of toxin, symptomatology, source of poison, time of the year, hospital stay and final outcome.

### RESULTS

During the period of study a total of 231 01 children were admitted to the paediatric wards. Out of these, 600 were admitted for accidental exposure to medicinal products or other chemicals, representing 2.59% (Table 1) of all admissions to the paediatric wards.

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**Table 1: Total number of poisoning and the mortality from 1988-1993 in Bahrain**

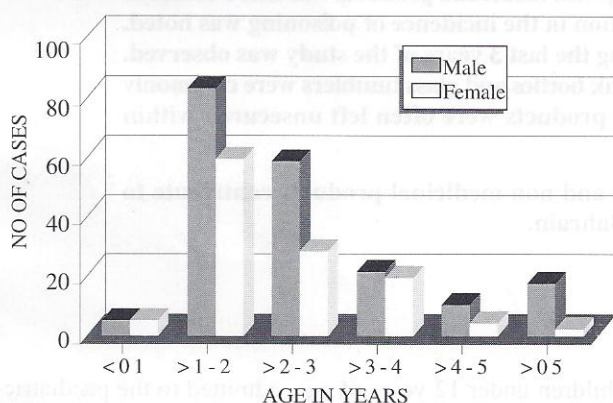
Year	Admissions	Poisoning(%)	Mortality(%)
1988	3489	127(3.5)	
1989	3418	116(3.4)	
1990	3694	108(2.9)	1
1991	4056	69(1.7)	1
1992	4206	88(2.1)	
1993	4138	92(2.2)	
Total	23101	600(2.59)	2(0.33)

The records of 311 patients were available for review. At presentation 146 out of the 311 patients were symptomatic, mostly due to poisoning with hydrocarbons (79), medications (46), and household detergents (21).

**Age and Sex Distribution (Fig 1)**

Ninety percent of children affected under the age of 4 years, 76.5% were under the age of 3 years. Forty five percent were between 1 to 2 years of age and 62.4% were boys. Male: Female ratio was 1.6:1

**Fig. 1. Frequency of poisoning by age and sex**



**Type of poison, Frequency in relation to Age, and Complications of Poisoning.(Table 2).**

Hydrocarbons were the most common toxins involved in accidental poisoning, accounting for 39.9%. Kerosene was the most common hydrocarbon ingested (88%). Medications were the next common cause of accidental poisoning (33.4%). Analgesics constituted 16%, antidepressants 14%, anticonvulsants 12%, and cardiovascular medications 11%. Miscellaneous group of drugs were involved in about half

**Table 2. Type of poison, frequency with relation to age, and complications of poisoning**

Substance	Age (Yr)			Total No. of cases (%)	Complications (%)	Place of poisoning (%)		Hospital stay (days)
	0-2	2-4	>4			Home	Outside	
A. Hydrocarbons				124 (39.90)	15 (12)	82	18	1.5
1. Kerosene	69	27	13					
2. Others	6	6	3					
B. Medications				104 (33.40)		93	7	2
1. Analgesics	3	13	1					
2. Anticonvulsants	3	7	3					
3. Antidepressants	6	6	3					
4. C.V. Agents	6	5	1					
5. Others	20	25	2					
C. Household Agents				64 (20.60)	3 (3.20)	63	37	2.5
1. Bleach (clorax)	21	16	3					
2. Others	8	9	7					
D. Pesticides				19 (6.10)	1 (5.26)	90	10	2
1. Naphthalene	3	8	0					
2. Rat Poison	3	2	1					
3. Others	2	0	0					

the total number of cases of poisoning with medicinal products.

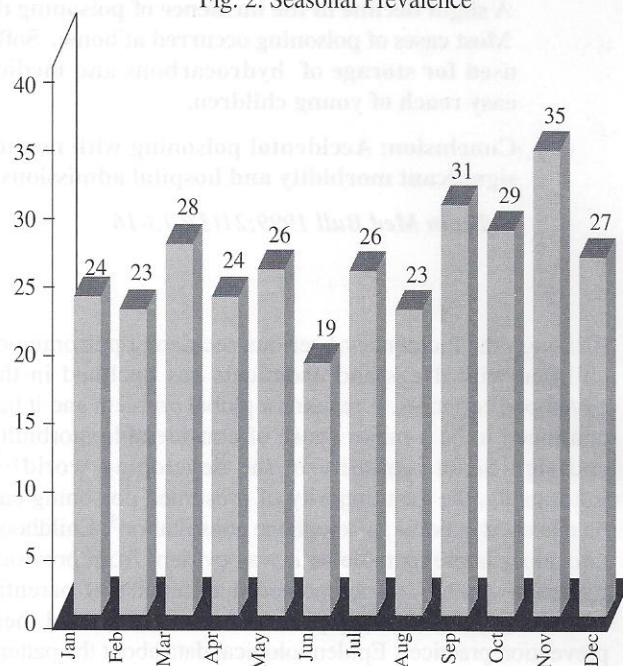
Naphthalene (moth balls), and other household insecticides were involved in 6.1%. Sodium hypochlorite (Clorax) was the most common (62.5%) agent involved in poisoning with household detergents (20.6%).

Chemical pneumonitis following kerosene (hydrocarbon) ingestion occurred in 15 patients. All recovered without any sequelae. Acute upper GI ulcerations following ingestion of corrosives occurred in two cases without any long term sequelae.

One patient with sulphuric acid ingestion had a stormy course with complete destruction of oesophagus and stomach. He required extensive reconstructive surgery.

There were 2 deaths during the 6 years of the study period. One child died in 1990 following ingestion of rat poison (sodium fluoroacetate) and another in 1991 as a result of orphenadrine (disipal) ingestion. Mortality rate following poisoning was 0.33% of total admissions in the paediatric wards.

**Fig. 2. Seasonal Prevalence**





**Seasonal Variation (Fig 2)**

No significant seasonal variation was noted. However, a higher incidence of poisoning was noted during the month of November and the lowest in the month of June.

**Table 3. Source of Poison**

	Hydrocarbons	Medications	Household agents	Chemicals
Soft Drink Bottle	35	0	2	0
Other Bottles	23	1	5	0
Glass Tumblers	10	0	6	0
Cooling Oil Cans	7	0	0	0
Bucket	0	0	2	0
Beans Can	3	0	0	0
Kettle	1	0	0	0
Disposal Drum	0	2	1	0
Unsecured	8	21	45	11
Unknown	37	55	28	8

**Sources of poisons (Table 3)**

Soft drink bottles and glass tumblers were used for storing hydrocarbons and these constituted the main sources of poisoning. Medications and other chemicals were frequently kept in unsafe areas within easy reach of the children. The source of poisons were not recorded in many cases.

**Hospital stay (Table 2)**

Average hospital stay for hydrocarbons (one and a half day), medicinal products (two days), and household detergents (two and a half days). We did not take into consideration the exceptionally long stay of a few cases.

**Prevalence (Table 1)**

A slight decrease in the prevalence of accidental poisoning was noted in the last three years of the study period.

**DISCUSSION**

One obvious shortcoming of our study is the fact that we were able to review the records of only about half the total number of patients admitted during the period of study. However, we believe that this has no significant influence on our findings as there was no bias in selection of the records, and the patient's records retrieval rate was approximately 50% for each year of study.

An admission rate of 2.59% in our study is higher compared to that reported from the developed and developing countries<sup>1,2</sup>. This is certainly due to the liberal policy of admitting every child with a history of accidental exposure to toxic substances or drugs, even in the absence of signs and symptoms of poisoning. Nevertheless, a slight decline in the incidence of poisoning was noted during the early nineties compared to the late eighties.

The peak prevalence of accidental exposure to poisons between 1 to 4 years of age and the slight male preponderance in this age group was similar to other surveys including reports from Saudi Arabia<sup>2-6</sup>.

Our study verified earlier reports of poisoning with non-medicinal products, like household detergents and hydrocarbons etc. being more common in infants and younger

children while those over the age of 2 years being more prone to poisoning with drugs<sup>4</sup>.

Following the pattern observed in the developing countries and in contrast with that in the developed countries kerosene was the most common substance involved in poisoning<sup>1-5</sup>. Kerosene is still used in many households for various purposes other than as fuel alone. Unfortunately, the method used for its storage is very improper. Our investigation found that kerosene and other hydrocarbons are commonly stored in soft drink bottles and glass tumblers and kept in places within easy reach of infants and young children.

Kerosene ingestion can cause gastrointestinal, respiratory and central nervous system toxicity<sup>6</sup>. Fortunately we had only 15 patients out of 109 (12%) with chemical pneumonitis and all of them recovered without any serious complications.

Childhood poisoning shows changing pattern. In Australia in the mid-fifties kerosene, pesticides and aspirin were the most common substances ingested, whereas in the early nineties, benzodiazepines, iron preparations, paracetamol and anticonvulsants were the main agents involved<sup>2</sup>. In our study the prevalence of poisoning with medicinal products (33.4%) was close to that of poisoning with hydrocarbons (39.9%). This pattern is in contrast to the pattern seen in developing countries<sup>3</sup>. Although we do not have data from the previous years, we feel that it could be suggestive of a change in the pattern of childhood poisoning in Bahrain. The common medicinal products ingested were analgesics, psychotropics and anticonvulsant drugs. Our investigation has revealed that the drugs involved in poisoning were not stored in safe areas and were not dispensed in child resistant containers.

Poisoning with household agents was less frequent in comparison to reports from Saudi Arabia<sup>3</sup>. Sodium hypochlorite (clorax) was the most common agent. No long-term complications were noted as a result of ingestion of clorax.

Naphthalene was the most common pesticide ingested. Although there were no complications, potential for serious sequelae exists, in view of the high prevalence of G6PD enzyme deficiency in the population<sup>7</sup>.

There was one death out of the six cases of poisoning with fluoroacetate (rat poison). The other fatality was from ingestion of orphenadrine who presented in status epilepticus and arrested in accident and emergency department. Another case of serious poisoning with organophosphate compound was saved by prompt diagnosis and administration of atropine.

There is a need to initiate a poison prevention interventional program for preschool children. The hazards of poisoning with potentially toxic drugs could be highlighted through the media. The focus should be on improving the family practices of storing chemicals, and household detergents in proper containers in secure areas, out of reach of young children. Dispensing of all oral medicinal products in child resistant containers should be enforced by appropriate legislation.

Physicians prescribing medicine can also play a role by giving precautionary advice to parents.



CONCLUSION

Accidental poisoning of children with medicinal and non-medicinal products contributes to significant morbidity and hospital admissions in Bahrain. It is essentially a preventable condition. This pilot study has highlighted the need for initiation of a poison prevention program for the education of the whole community. Appropriate legislation should be introduced to enforce dispensing of all oral medications in child resistant containers.

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