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## Childhood Poisoning, A Casualty Unit Study In A Pediatric Teaching Hospital

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### Abstract

**Background:** Poisoning is an important cause of morbidity and mortality in childhood.

**Objective:** The aim of this study is to describe the epidemiological features of acute poisoning in children less than 16 years old who were admitted to the casualty unit, to analyze various conditions and management parameters in childhood poisoning.

**Methods:** Ninety eight cases of poisoning were admitted over a 6-month study period (2nd of May - 3rd of November 2004). Data was collected upon admission and patients were subsequently followed-up. Study was conducted in the casualty unit, in the central child teaching hospital/Baghdad, questionnaire included age and sex of patients, detailed important family history features, poison related information, clinical presentations and initial management given. All the patient's families were advised on future safety measures at home regarding the poison used.

**Results:** Patients admitted were with the age range of 1-2years. 57% of admissions were boys with mean age of 3.07 years, while female patients were 41% with mean age of 3.98 years. Ninety four percent of poisoning was accidental, occurred indoor and the storage place of the poison was a home store or home pharmacy. Forty percent of patients ingested oral medication, while 37% ingested kerosene and the rest ingested other household products. Most patients were admitted with no complain after a history of poisoning, for observation which did not require antidotes, while vomiting was the next common presentation, gastric lavage was the next common action taken in the hospital's casualty unit. Two percent of the patients had samples taken for toxicological analysis. Thirty eight percent of patients were discharged from causality unit in good general condition, while thirty five percent were discharged on parent's responsibility. There was 3.1% fatality rate in the study period.

**Conclusion:** Improving health education and safety measures are essential in prevention of poisoning in children.

**Key words:** Poisoning, kerosene poisoning, Childhood poisoning, Accidental ingestions.

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### Introduction:

**P**oisoning is a major problem in the pediatric population. The offending substances used vary from place to place. Information on poisoning trends in Iraq is essential and there is an impression among clinicians that there has been a change in the commonly used poisons over the years<sup>[1]</sup>.

A wide variety of medications and substances can kill a toddler who ingests just a single dose. More than 1 million children ingest toxins in the United States every year, and more than 85% of the ingestions are accidental. Most of the children are younger than 6 years<sup>[1]</sup>.

The intent of this study is not to guide treatment of poisoned children but rather to report toxic ingestions that carries high morbidity and mortality<sup>[2]</sup>. The study addresses some types of toxic ingestions and those that may cause serious illness or injury, even in small quantities.

Many of the involved toxins are common at home or the household products. Ingestion of relatively small amounts of commonly used perfumes, cosmetics, cleaning solutions, alcoholic beverages, and other products may cause serious injury or death<sup>[3]</sup>.

Medications also are a common source of toxic ingestions in small quantities.

Without taking prior precautions, visits to the homes of friends or relatives (even grandparents) or

visits from guests who bring medications into the home may result in tragedy<sup>[1,4,5,6]</sup>.

### Patients & Methods:

This study is a cross-sectional analysis of 98 cases of childhood poisoning, admitted to the casualty unit in the central child teaching hospital in Baghdad and over a six months period (2nd of May - 3rd of November 2004).

History and information were taken from the family (sex, age, family residence, mother's educational level, mother's occupation, source of information, similar cases in the family, cause of poisoning, poisonous material, primary place of poisoning, storage place of poisonous material, clinical presentations, bringing toxin to hospital). Details of the initial management, toxicological testing and state of the child on discharge from the causality unit were recorded.

All results were expressed in numbers and percentages, the statistical analysis was done using t-test and Chi-square and P-value <0.05 was considered as significant.

### Results:

Patients admitted were with the age range of 1-12years with mean age of 3.07+/-2.70 years. Fifty seven of admissions were boys with mean age of 3.07+/-2.73 years, while female patients were forty one with mean age of 3.98+/-2.38 years.

Regarding important family history features, the study revealed that urban residence was the main location(93.9%), most mothers had secondary school level of education(71.4%), most mothers

were house wives(90.1%), mothers were the predominant source of data(77.6%) and most studied cases had no similar case in the same family(83.7%) as shown in table 1

**Table 1: important family history features.**

Family history features		No.	%
Family residence	Urban	92	93.9
	Rural	6	6.1
Mother's educational level	Illiterate	9	9.2
	Read & Write	9	9.2
	Secondary school	70	71.4
	High education	10	10.2
Mother's occupation	House wife	89	90.1
	Employer	9	9.9
Source of information	Father	12	12.2
	Mother	76	77.6
	Grandfather	6	6.1
	Others	4	4.1
Similar case in the family	Yes	13	13.3
	No	85	86.7

Concerning poison related information; the study revealed that accidental poisoning was the predominant cause of poisoning (93.9%), poisonous material was medicines as the commonest agent of poisoning (39.8%), followed by kerosene(37.8%), indoor place of poisoning was the predominant primary place of poisoning(84.7%), and the shelf and home pharmacy were predominant storage places of poisoning(41.8%) as seen in table 2. No complain was in(41.8%), while vomiting was the

next common(39.8%), the poison was not brought in most of cases to the hospital(65.3%), no toxicological testing was done in the vast majority of cases(96%) and diagnosis of poisoning was established on history clinical examination, close observation was the predominant Initial management action(43.9%) and most patients were discharged from the causality unit in good condition(37.8%) as seen in table 3.

**Table 2: poison related information.**

Poison related information		No.	%
Cause of poisoning	Accidental	92	93.87
	Therapeutic error	6	6.12
	Suicidal attempt	0	0
	Substance abuse	0	0
Poisonous material	Kerosene	37	37.8
	Medicines	39	39.8
	Insecticide	13	13.3
	Others*	9	9.2
Primary place of poisoning	Indoor	83	84.7
	Outdoor	15	15.3
Storage place of poison	Garden	20	20.4
	Kitchen	23	23.5
	Refrigerator	14	14.3
	shelf or home pharmacy	41	41.8

\* other types of poisoning including plant, food and corrosives.

**Table 3: clinical presentations and initial management action.**

Clinical presentations and management		No.	%
clinical presentations	No complain	41	41.8
	Vomiting	39	39.8
	Respiratory distress	13	13.3
	Fit	3	3.1
	Drowsiness	2	2
Bringing toxin to hospital	Yes	34	34.7
	No	64	65.3
Toxicological testing	Yes	2	2
	No	96	96
Initial management	Gastric lavage	25	25.5
	Antidote given	16	16.3
	Close observation	43	43.9
	Others	14	14.3
State of the child on causality discharge	In good condition	37	37.8
	On parent's responsibility	35	35.7
	Referred to ward	23	23.5
	Death*	3	3.1

\* caused by two anticholinesterase insecticide poisoning used in eradicating scalp lice and one case of kerosene poisoning ingestion.

There was a significant association between the condition of child on discharge from causality unit and the type of poisoning ( $P < 0.001$ ) and initial management in the causality unit ( $P < 0.009$ ). While no significant association was noticed with bringing toxin to hospital ( $P = 0.137$ ) and toxicology testing on toxin material ( $P = 0.556$ ), mother's educational

level ( $P = 0.333$ ) and sex of patients ( $P = 0.223$ ) as seen in table 4

There was a significant association of the age of patients with the type of poisoning material ( $P = 0.001$ ) while no significant association was noticed with state of causality discharge ( $P = 0.811$ ) or the primary place of poisoning ( $P = 0.880$ ) as seen in table 5

**Table 4: association of discharge state from causality unit with other poisoning parameters.**

		State of discharge from causality					P Value
		On parent's responsibility	In good condition	Referred to ward	Death	Total(%)	
Type of poisoning material	Kerosene	15	18	3	1	37(37.8)	0.001
	Medicines	14	18	7	0	39(39.8)	
	Insecticide	3	1	7	2	13(13.3)	
	Others*	3	0	6	0	9(9.2)	
Initial management	Gastric lavage	9	10	6	0	25(25.5)	0.009
	Antidote	2	3	9	2	16(16.3)	
	Observation	20	17	5	1	43(43.9)	
	Others	4	7	3	0	14(14.3)	
Bringing toxin	Yes	14	9	11	0	34 (34.7)	0.137
	No	21	28	12	3	64(65.3)	
Toxicology testing	Yes	2	0	1	0	3(3.1)	0.556
	No	34	37	21	3	95(96.9)	
Mother's educational level	Illiterate	3	4	1	1	9(9.2)	0.333
	Read & Write	3	5	1	0	9(9.2)	
	Secondary school	23	24	21	2	70(71.4)	
	High education	6	4	0	0	10(10.2)	
Patient's sex	Male	24	22	10	1	57 (58.2)	0.223
	Female	11	15	13	2	41(41.8)	

\* other types of poisoning including plant, food and corrosives.

**Table 5: relationship of age with type of poisoning, place of poisoning and discharge state from casualty unit.**

		No.	Mean age (year)	(St.deviation)	P Value
<b>Type of poisoning material</b>	<b>Kerosene</b>	37	2.232	1.827	<b>0.001</b>
	<b>Medicines</b>	39	3.879	2.372	
	<b>Insecticide</b>	13	6.423	3.353	
	<b>Others</b>	9	2.322	0.871	
	<b>Total</b>	98	3.450	2.615	
<b>State of causality discharge</b>	<b>On parent's responsibility</b>	35	3.385	2.830	<b>0.811</b>
	<b>In good condition</b>	37	3.332	2.385	
	<b>Referred to ward</b>	23	3.565	2.640	
	<b>Death</b>	3	4.833	3.617	
	<b>Total</b>	98	3.450	2.615	
<b>Primary place of poisoning</b>	<b>Indoor</b>	83	3.434	2.702	<b>0.880</b>
	<b>Outdoor</b>	15	3.546	2.149	
	<b>Total</b>	98	3.522	2.542	

**Discussion:**

Boys were presented more frequently and at lower age than girls, a finding is similar to that reported by others<sup>[2,4,6,7,8]</sup>.

Regarding family history features ; Urban area was common locality because the study was done in a hospital located in an urban area., secondary school education of the mother was the predominant level which reflects common community education, most of mothers were house wives and so they were in close contact with their siblings and the commonest source of information<sup>[8,9]</sup>.

Regarding poison related information; results showed a high incidence of accidental poisoning, other works reported similar results<sup>[2,8,9,10,11]</sup>.

Suicidal type of poisoning and substance abuse are none in our study in contrast to other studies, probably related to the low age group involved in the study and the bad look of suicide and substance abuse in our community, thus making it unusual mode of ending own's life<sup>[5,10]</sup>.

Medicines were the commonest poison in this study which coincides with that reported by others<sup>[2,4,5,10,11]</sup>.

Study revealed a high incidence of kerosene poisoning(next to incidence of medicine poisoning) in contrast with other similar studies which could be related to many factors including the hot summer season during which the study was done, and with using a soft drink containers for kerosene which were usually mistaken for water by the children, or

due to vast availability of kerosene indoors as a fuel for kerosene lamps that are widely used in cases of common electrical turn off.

Although the adult experience of insecticide poisoning is largely of intentional ingestion, poisoning and contamination in childhood is usually accidental, a finding is similar to<sup>[2,12]</sup>.

The shelf or home pharmacy were the commonest places of poison storage, which explains the high incidence of indoor poisoning, a finding is in agreement with others<sup>[2,8,10]</sup>.

Regarding clinical presentations and management; study showed a high incidence of vomiting next to no complain as a presenting complain; a finding is probably explained by the fact that medicines were the most used toxin and the fact that a lot of parents try early evacuation of the stomach by gagging the child before admission.

Respiratory distress was low in contrast to other studies which could be due to the hard impact of kerosene poisoning on the family so that having a sip of it or spilling some of it close to the mouth or on the cloth and making it smelly, would make the family seek help for a presumed kerosene poisoning<sup>[1,4,13,14]</sup>.

Close observation was the commonest initial action in the casualty unit a finding is similar to other studies<sup>[1,5]</sup>, while antidote usage is determined in the present study by it's availability and type of toxin and time interval<sup>[7,9,10,12]</sup>.

Insecticide poisoning carries a high incidence of death a finding is similar to other studies<sup>[1,7,12]</sup>.

State of discharge from causality was a significant association with type of poisoning material ( $P < 0.001$ ) and initial management ( $P < 0.009$ ) in the present study, a finding is similar to others<sup>[5,13]</sup>.

Types of poisoning material were significantly associated with mean age of patients in our study, a finding is similar to others<sup>[2,6,9,14,15]</sup>.

#### Conclusion:

There is an increasing variety and complexity of poisonous substances ingested through out the world, and this would make the establishment of a better health education directed to the parents, emphasizing the importance of safe storage of household poisons (chemicals, kerosene and others) and a good poison control center a logical step.

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