Original Paper

An Experience of Toxicology Cases in the Emergency Department of Al-Noor Hospital, Saudi Arabia

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ABSTRACT

Objective: To study the pattern of toxicology cases and their management, presenting to the Emergency Department (ED) of Al-noor Specialist Hospital, KSA for a six-month period.

Study Design & Methodology: This descriptive study was conducted at Al-noor Specialist Hospital for six months i.e. 01-01-1425H—30-06-1425H corresponding to 21-02-2005G—16-08-2005G. The data were collected from the ED cards of toxicology cases. Out of a total of 100 cases, 12 cases were deficient in data regarding some of the variables, i.e., age, time of presentation, duration in ED, etc.

Results: One hundred cases were included in this study. Fifty two (59%) out of 88 were pediatric cases. Native Saudis were predominant (87%). Regarding the nature of toxins, except narcotic and alcohol abuse in adult cases, the remaining abusers were predominantly children rather than adults. Eighty two percent of the cases received both diagnostic and treatment interventions, while 7% did not receive any kind of management. Likewise, 36.8% cases received IV fluids & gastric lavage, while 35.6% received only gastric lavage. More than six investigations were done for only 2.3% subjects. About 19.3% presented in the morning shift. 81.8% subjects were retained in the emergency room for 0-3hours. 41% were admitted.

Conclusion: The maximum number of cases encountered were pediatric cases. Drug associated visits were predominant. Treatment and diagnostic interventions were done for more than three fourth of the subjects. Gastric lavage had been done for more than half of the cases. Most of the cases could be moved out of the emergency department within three hours.

Key Words: Poison, Toxicology, Emergency department, Saudi Arabia

Introduction

Poisoning is an important health problem in every country of the world. Occupational exposures to industrial chemicals and pesticides, accidental and intentional exposures to household and pharmaceutical products, all contribute to morbidity and mortality. However, the magnitude of the problem, the circumstances of exposure, and the types of poisoning vary from country to country.[1] Acute poisoning is an important clinical emergency, and contributor to morbidity and mortality.[2]

Poisoning represents one of the most common medical emergencies in childhood, and epidemiological profiles differ from country to country. Thus, special epidemiological surveillance for each country is necessary to determine the problem, according to which exact preventive measures can be taken.[3] Millions of people are exposed to danger by hazardous occupational practices and unsafe storage. Poisonings are common among young children as they explore their environment and put various foreign objects in their mouth.[4]

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The modernization and expansion of the health care system in the Kingdom of Saudi Arabia have led to the wide availability of drugs, and with it a potential for their misuse. Although drug-related problems constitute a minor problem in Saudi Arabia, there is a potential for their increase in the future.[5]

Al-noor Specialist Hospital is a tertiary care referral hospital in Makkah region having state-of-the-art emergency facilities, with a well equipped emergency department including triage area, adult care area, critical care area, Ob/Gyn area, pedia care area, minor operation theater, radiology department, laboratory, and pharmacy. This study focussed on the toxicology cases presenting to the emergency department, and the management undertaken for them.

Materials and Methods

This descriptive study was conducted at Al-noor Specialist Hospital for six months i.e. 01-01-1425H—30-06-1425H, corresponding to 21-02-2005G—16-08-2005G. Emergency department (ED) cards were reviewed for the following variables: age, nationality, type of toxin taken by the subject, management interventions, time of presentation, duration of stay in ED, and outcome. Twelve ED cards were deficient with regard to some of the variables. The pediatric group was divided into the following categories: infants, toddlers, pre-school children and school going children.[6,7] Cases were divided into cause related groups, i.e., drug associated, corrosive associated, narcotic & alcohol associated, hydrocarbon associated, and organophosphorus associated. Each day was divided into three shifts: morning (8am-4pm], evening [4pm-12am] and night [12am-8am].

Results

During the study period, the total emergency department visits numbered 104844, out of which 0.1% cases of toxicology met the criteria of study. Twelve ED cards had deficient information for some of the variables. Out of the remaining (88) cases, 52 (59%) were pediatric cases, while the remaining were adults. In the pediatric age group, toddlers were maximum (25; 48%), followed by pre-school children (16; 30.8%). In the adult group, most cases were between 13-24 years of age (24; 66.7%) and only 3 (8.3%) were above 44 years of age. Native Saudis accounted for the maximum number (87%) (**Table 1)**.

Regarding the type of toxins taken by the subjects, drug associated cases were sixty two in number, nineteen cases were related to corrosive intake, eight cases were narcotic and alcohol abuse cases. Among children organophosphorus exposure occurred in 4, while six of them had been exposed to hydrocarbon intake (**Table 2)**.

Regarding management intervention, 7% of the cases received no intervention, while 82% received both treatment as well as diagnostic interventions. Diagnostic interventions were done for eighty-eight cases, out of whom 1-3 investigations were done for 57 (64.8%), while only 2 (2.3%) cases were sent for more than six investigations. Treatment was administered to eighty-seven cases,

Table 1 Demographic Data

		Classification	No	%
Age Groups in years n=88 Data missed = 12	Pediatric cases n=52 (59%)	0-1 years (Infants) 13 months-2 years (Toddlers) 25 months-5 years (Pre-school child) 6-12years (School going child)	8 25 16 3	15.4 48 30.8 5.8
	Total		**52**	**100**
	Adult Cases n=36 (41%)	13-24yrs 25-34 35-44 > 44	24 5 4 3	66.7 13.9 11.1 8.3
	Total		**36**	**100**
Nationality n=100	S N/S	87 13	87 13	

Table 2 Toxins Taken by Subjects (n = 100)

Classification of Toxins	Total cases (100) Data deficient (12)	Pediatric (n = %)	Adults (n = %)
Drug associated	62 - 9 = 53	32 = 60.4	21 = 39.6
Corrosives	19 - 3 = 16	10 = 62.5	6 = 37.5
Narcotics & Alcohol	8 - 0 = 8	0 = 0	8 = 100
Hydrocarbons	7 - 0 = 7	6 = 85.7	1 = 14.3
Organophosphates	4 - 0 = 4	4 = 100	0

Table 3 Management Interventions (n =100)

Interventions	N	%
Only Treatment Given	5	5
Only Diagnostic Intervention	6	6
No intervention	7	7
Both given	82	82

Table 4 Subjects who received Interventions (n = 87)

Types	(n = 87)	(% = 100)
IV fluids & Gastric lavage	32	36.8
Gastric lavage Only	31	35.6
IV fluids Only	18	20.7
IV fluids & Medication	4	4.6
Medication Only	1	1.1
Only Gastric Aspiration	1	1.1

Table 5 Admissions according to Toxin Categories (n=100)

Toxins	No of cases	Admission (No.)	%
Organophosphorus Intake	4	4	100
Corrosive Intake	19	8	42
Drug associated	62	25	40
Hydrocarbons Intake	7	2	28.6
Narcotic & Alcohol intake	8	2	25

out of whom 32 (36.8%) were given IV fluids and gastric lavage, while 31 (35.6%) got nothing except gastric lavage, and 18 (20.7%) received only IV fluids. Subjects receiving IV fluids with medication were 4 in number (4.6%), while 1 (1.1%) case received only gastric aspiration **(Table 3**, **Table 4).** Out of eighty-eight cases, most presented in the evening shift (47; 53.4%) followed by night shift (24; 27.3%). Most of the cases (72; 81.8%) left the emergency department before three hours. The total admissions apart from toxicology cases, through the emergency department were 7504, i.e., 7.2% of all the presenting toxicology cases. Victims of organophosphorus exposure got maximum admissions (4; 100%), while out of a total of eight alcohol victims only 2 (25%) got admission (**Table 5**).

Discussion

The health impact of chemical exposures and poisoning is well recognized in most industrialized countries where chemical safety and poison control programmes are established.[8] In contrast, most developing countries have not yet fully recognized the risks posed by chemicals on human health and environment. One reason is the lack of sound national epidemiological data on toxic exposures

and poisoning. Some case studies and hospital based retrospective and prospective studies have documented poisoning related morbidity and mortality, and changing trend of chemical exposures.[9] Similarly, self-harm has often been thought of as a problem, particular to the industrialized world.[10] Pesticide poisoning from occupational, accidental, and intentional exposure is a major problem in developing countries.[11] Since our study was hospital-based, and not population-based, we could not make categorical conclusions about the incidence of acute poisoning. It is possible that some patients with minor poisoning were treated in the primary health centers, and never presented to our hospital.

In our study, only one hundred poisoning-related visits to the Accident & Emergency Department were recorded over the period of six months i.e., 0.1% of total emergency department visits, which was less than that of a study in USA.[2] Our study showed an average of 16.7/month, which is higher than a study conducted in Oman,[12] but lower than observed in some other studies.[13,14] The lower number of visits of poisoning in our study was not only due to religious, cultural, and legal deterrents, but also due to routine health education at the various primary health centers (PHC) in the city, or due to more regulated family system. The study of Dawson KP[15] comprised 134 pediatric poisoning cases over a 4-month period, with 55% of drug-associated cases, while we found only 52 pediatric cases, of which 61.5% were drug-associated, which is almost double that of Moghadamnia's study,[16] that also showed a great difference in organophosphorus poisoning when compared to our study. Even if we calculate the drug-associated visits per total visits of ED in our study, i.e., 0.06%, these are still much less than some of the studies concerned with only drug-related visits to emergency departments, for instance Patel (28%), Prince (2.9%), and Malhotra (5.9%).[17-19]

In our study, 59% of the poisonings involved children below 12 years of age, and those children aged 13 months-2 years (toddlers) were the most vulnerable. Therefore, child-resistant containers for drugs and other household products could be one of the most important interventions for the reduction of childhood poisoning incidence. Our results are comparable with hospital-based reports from other authors.[1,9,14,20] A recent study from the United States of America showed that children under 5 years of age had a significantly higher average annual rate of poisoning-related visits to emergency departments than other age groups.[2]

In our study, and that of Oman,[1] pesticide poisoning fell in the lowest category of poisoning, which is in contrast to the high incidence of pesticide poisoning recorded in some Asian countries.[9,21] Similarly, the major type of poisoning in our study was drug-associated, which is similar to several other studies.[2,14,22,23] But a study done in Finland showed that alcohol-intoxicated visits were more than two thirds of the total,[13] in contrast to our study which showed only 8% alcohol-intoxicated cases. This may be because alcohol use is more prevalent in European society, and alcohol abuse is a major health threat over there. This is also a major cause of morbidity and mortality in America,[24] but Saudi Arabia has completely banned the production, importation or consumption[25] of alcohol.

More than 70% cases in our study received gastric lavage, which is comparable with other studies in which gastric lavage was carried out at both primary and secondary care levels for all cases of gastric poisoning,[1] while it is 20% in the study of Siddique,[26] and studies from Finland,[13] and that of Akkas[27] had different ranges. We did not perform gastric lavage for any corrosive-related poisoning, as recommended by Eddleston,[4] since corrosive agents cause intense damage to the pharynx, oesophagus, and stomach, often producing perforations. This type of poisoning is quite unlike other forms of acute poisoning. Pesticides and drug overdoses present with an acute crisis; if the patient survives, there will be few complications. In contrast, survivors of acute corrosive poisoning often require extensive surgical follow-up for their GI complications.

Our study had a total of 41% admissions as a whole, which can be compared with some other studies.[12,13]

Conclusion

Poisoning-related visits in our hospital emergency department comprised a very small percentage of total visits, and the majority of victims were children. Drug-related problems were the most significant cause of the visits, and organophosphate cases comprised most of the admissions.

Primary caregivers, such as family physicians and pharmacists, should collaborate more closely to provide and

reinforce care plans and monitor patients to prevent further poisoning related visits to the emergency department, and subsequent morbidity and mortality. Further data from emergency departments of all the hospitals of Makkah and primary health centers are needed to compute the accurate figure, and detect any changing patterns to provide guidance for effective poison prevention programs. Identification and documentation of epidemiological aspects and other variables in childhood poisonings are of great importance for treatment plan, and determination of proper preventive measures.

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