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Original Research Article

Assessment of type, clinical characteristics, nature and outcome of poisoning cases in two hospitals of U.A.E.

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ABSTRACT

Background: Poisoning is an important public health problem, causing significant morbidity and mortality throughout the world. Currently limited data available in UAE regarding the incidence, type of poison, management and outcome of poisoning cases both in adults and children are very limited. The present study focused to assess the type, clinical characteristics, nature and outcome of poisoning cases in two secondary and Tertiary Care Hospitals of U.A.E.

Methods: This was a prospective observational study conducted in two hospitals of northern emirates of U.A.E. Patient case notes related to hospital admissions due to poisoning were identified and reviewed by the study investigator. Various details such as patient demographic characteristics, type, clinical characteristics, management and outcome of poisoning were entered into a suitably designed data collection form. The collected data were analyzed using poison severity and snakebite severity assessment scales.

Results: A total of 97 poisoning cases was identified during the study period. The prevalence of poisoning among male (50.5%) and female (49.5%) was found to be almost similar. The majority of poisoning cases 55 (56.7%) was of accidental type. The most common type of agent responsible for poisoning was drugs 61 (62.9%). Paracetamol was the most common drug involved in poisoning 16 (26.2%). The outcome of the poisoning was a recovery in majority 96 (98.9%) of the cases. Demographic factors such as gender, age, nationality and occupation were found to be significantly ($p<0.05$) associated with the intention and type of poisoning agent.

Conclusions: The study concluded that the most common poisoning agent involved in poisoning was drugs. The majority of the poisoning cases were of accidental type. The outcome of the poisoning was a recovery in the majority of the cases and no mortality were reported.

Keywords: Acute poisoning, Drugs in poisoning, Household chemicals, Snake bite

INTRODUCTION

Poisoning may occur due to exposure to drugs, industrial chemicals, household chemicals, plants, venomous animals, insects and agrochemicals etc.[1] Poisoning is an important public health problem, which is causing significant morbidity and mortality throughout the world.[2] The number of poisoning cases is increasing rapidly throughout the world.[3] Vast amounts of literature are available regarding the incidence, type, management and outcome of poisoning from different parts of the world. Studies from developing countries have identified a wide variety of poisoning agents responsible for intentional and unintentional poisoning both in adults and children.[4-8]

Paracetamol was most commonly implicated drug in many of these studies and deaths due to paracetamol poisoning is highlighted in some of these studies.

A study conducted in a rural tertiary care teaching hospital in India reveals highest incidence of poisoning cases in the age of the group between 14 to 40 years with male preponderance.[9]

In another study, regarding organophosphorus poisoning in North India, there were 116 patients admitted to the hospital with organophosphorus poisoning, mostly between the age group of 25 to 49 years old. Most of the patients had intentionally consumed the poison.[10]

In a toxicovigilance study conducted in South African hospitals, the majority of admissions were adults with intentional poisonings and female predominance among the adult population. The most poisoning agents that were found in these cases where medicines followed by non-drug chemicals (pesticides, ethanol, irritant/corrosive agents etc.).[11]

A prospective study at Sultan Qaboos University Hospital in Oman reported 204 cases in emergency of which poisoning with therapeutic agents (50%) were most common.[12] In another study, which was carried out in 45 Health Centers and Hospitals of Oman, a total of 1569 poisoning cases were recorded.

The majority of poisoning cases were due to unknown animal or insect bites (25.4%), followed by scorpion stings (19.7%) and ingestion of pharmaceutical substance (18.2%), while pesticide poisoning was rare with (1.9%).[13]

A retrospective study done in Al-Qassim region of Saudi Arabia from April 1999 to February 2003 revealed that the number of poisoning cases has increased from 66 to 114 during the study period. Pesticides were the most chemicals involved, followed by paracetamol and other analgesics were involved in poisoning.[14]

In United Arab Emirates (UAE), a study on childhood accidental poisoning revealed that household chemical and medicine poisoning were more predominate.[15] According to a Health Authority of Abu Dhabi (HAAD) statistics, injury, poisoning and other consequences of external causes, led to death scores of 3% of the total deaths in the year 2011.[16]

Currently data available in UAE regarding the incidence, type of poison and outcome of poisoning cases, both in adults and children are very limited. This study will help in understanding the pattern and the common poisoning agents in the country, which will help in providing the best management and to achieve better therapeutic outcome.

The data obtained could also help in educating the general public to take appropriate preventive steps against the common agents responsible for the poisoning. The objectives of the study were to evaluate the type, clinical characteristics, the nature of management of poisoning cases in two hospitals of Ras Al Khaimah, U.A.E.

METHODS

The present study was a prospective observational study, conducted at two secondary care hospitals of U.A.E from September-2013 to June-2013 after obtaining both institutional and regional Research and Ethics committee approval.

Patient case notes related to admissions due to poisoning were identified and reviewed by the study investigator by attending regular clinical meetings, visiting casualty department, wards, telephone calls to the in-charge staff nurses of the study sites.

All acute poisoning cases due to chemicals, drugs, household products, heavy metals and environmental poisoning (snake bite, scorpion bite, insect bite, etc.) cases admitted to the study sites during the study period were included and were considered for the data collection. Food poisoning cases were excluded from this study.

Details such as patient demographic characteristics, type, clinical characteristics, management and outcome of poisoning were obtained through electronic medical records and manual patient medical records and the required data obtained were entered in a suitably designed data collection form. The collected data were analyzed based on poison severity scale and snakebite severity scale.[17,18]

Statistical analysis

The collected data was summated and were entered into the Microsoft-excel sheet and results were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21.0. The categorical data were expressed in frequency and percentages, while the continuous data was expressed in Mean±SD.

The chi-square test was used to assess the association between demographic variables and intention of poisoning and types of poisoning agent. A probability value of less than 0.05 was considered as statistically significant.

RESULTS

A total of 97 cases was identified from both hospitals during the study period. A total of 49 (50.50%) poisoning cases were documented in female. The majority of the poisoning cases were in the age group of 21-30 (30.9%) years of age, followed by the age group of 10-20 years 28 (28.8%). The majority of the poisoning cases involved UAE nationals 51 (52.6%) followed by Pakistani 8 (8.2%) nationals (Table 1). Among the study population, higher incidence of poison was documented in working group 52 (53.60%). While students and housewives were accounted

for similar number of poisoning cases 13 (13.4%). The majority of the poisoning cases admitted were due to accidental poisoning 55 (56.7%) followed by intentional 41 (42.3%).

Higher percentage 22 (53.7%) of accidental poisoning was documented in children less than 13 years of age. Home was the primary place of incident of poisoning in majority of the cases 71 (73.7%), followed by work place 7 (7.2%).

Table 1: Demographic parameters of study population.

Demographic parameters	n (%) (n=97)
Age (years)	
≤9	26 (26.8)
10-20	28 (28.8)
21-30	30 (30.9)
31-40	09 (9.2)
41-50	03 (3.0)
>60	01(1.0)
Gender	
Male	49 (50.5)
Female	48 (49.5)
Nationality	
UAE National	51 (52.6)
Bangladesh	03 (3.1)
India	03 (3.1)
Egypt	05 (5.2)
Sri Lanka	07 (7.2)
Filipino	03 (3.1)
Pakistan	08 (8.2)
Others	17 (17.5)
Employment status	
Employee	52 (53.6)
Student	13 (13.4)
Housewife	13 (13.4)
Others	19 (19.5)

Among the data available, the majority of the poisoning cases 62 (63.1%) were admitted to the emergency department in less than two hours of exposure to poisoning agents followed by 24 (24.7%) cases admitted within 2 to 4 hours of poison exposure (Table 2).

Drugs were the major type poisoning agents involved in majority 61 (63%) of the poisoning cases followed by "other" types of poisoning agents (n=15) (Table 3 and 4).

The majority of the drugs related poisoning 19 (31.15%) were due to the other category (different class/type) to medications followed by paracetamol and cocktail of medications contributing 16 (26.23%) each of the poisoning cases (Table 3).

The management varies from simple administration of activated charcoal, gastric lavage, administration of specific antidote and supportive medications. The majority of the poisoning cases 79 (81.4%) were admitted in the hospital for a period of 1 to 3 days, followed by 10 cases, which were admitted for 4 to 6 days.

Most of the poisoning cases 84 (98.8%) were graded as low severity. There was a total of 12 cases of poisoning due to snakebite during the study period. A total of 7 (58.3%) of the cases were in the severity level of 0, followed by severity level of 1 (34%).

A total of 96 poisoning cases (98.6%) was recovered except one case (1.4%), which developed secondary complication due to acute poisoning (Table 5).

Table 2: Nature and clinical characteristics of poisoning.

Nature and clinical characteristics	n (%) (n=97)
Reason of poisoning	
Intentional	41 (42.3)
Accidental	55 (56.7)
Unknown	01 (1.0)
Accidental poisoning cases according to age groups (n=41)	
Adults and children >13 years	19 (46.3)
Children <13-year-old	22 (53.7)
Place of poisoning	
Home	71 (73.7)
Workplace	07 (7.2)
Farm	05 (5.1)
Others	14 (14.4)
Time elapsed between poison exposure and hospital admission	
<2 hours	62 (63.1)
2-4 hours	24 (24.7)
5-7 hours	04 (4.1)
8-10 hours	03 (3.1)
>10 hours	04 (4.1)
Types poisoning agents	
Drugs	61 (62.9)
Snakebite	12 (12.3)
Household products	09 (9.2)
Others	15 (15.5)
Duration of admission of poisoning cases	
1-3 days	79 (81.4)
4-6 days	10 (10.3)
7-9 days	06 (6.1)
>10 days	02 (2.0)

There was a statistically significant association between the gender (p=0.042), age (p<0.001) nationality (p=0.003) occupation (p<0.001) and the reason of poisoning.

While there was a significant association between the gender (p=0.001) age (p=0.023), nationality (p=0.004) occupation (p=0.047) and the type of poisoning agent.

Table 3: Sub-classification of different drugs involved in poisoning.

Type/class of medication	Drug(s) involved in poisoning	
Paracetamol (n=16)	Paracetamol (n=16)	
Cocktail of medications (n=16)	Diazepam with Paracetamol (n=1)	Tramadol, Alprazolam, and procyclidine (n=1)
	Metformin and Spironolactone (n=1)	Imepenam and Tricyclic antidepressant (n=1)
	Lisinopril and unknown tablet (n=1)	Multi vitamins, Diclofenac, Herbal (n=1)
	Amitriptyline, Ziprasidone, Paracetamol (n=1)	Paracetamol and Ibuprofen (n=1)
	Ziprasidone, Gabapentin, Quetiapine and Lamotrigine (n=1)	Multi vitamins, Sitagliptin, Metformin (n=1)
	Paracetamol, antihistamine, cough syrup (n=1)	Decongestant and Diclofenac (n=1)
	Paracetamol and Amoxicillin (n=1)	Quetiapine, Gabapentin, Lamotrigine (n=1)
	Amoxicillin and Mefenamic acid (n=1)	Analgesic and Ibuprofen (n=1)
Psychotropic medications (n=6)	Escitalopram (n=1)	Diazepam (n=1)
	Pregabalin (n=1)	Clonazepam (n=1)
	Carbamazepine (n=1)	Unspecified anti-depressant (n=1)
NSAIDs (n=4)	Ibuprofen (n=4)	
Other medications (n=19)	Anti-histamine (n=3)	Herbal medication (n=1)
	Unknown medication (n=3)	Terbutaline (n=1)
	Salbutamol (n=2)	Vitamin D (n=1)
	Oxybutynin (n=1)	Dydrogesterone (n=1)
	Iron (n=1)	Perphenazine (n=1)
	Tramadol (n=1)	Hyoscine (n=1)
	Decongestant (n=1)	Anti-diabetics (n=1)

Table 4: Distribution of "Other" types of poisoning agents.

Other poisoning agents	n (%) (n=15)
Carbon monoxide poisoning	02 (13.3)
Unknown chemical ingestion	03 (20)
Unknown bites	02 (10)
Rat poisoning	01 (6.6)
Methyl chloride ingestion	01(6.6)
Pesticide ingestion	01(6.6)
Kerosene ingestion	01(6.6)
Gasoline ingestion	01(6.6)
Silicone ingestion	01(6.6)
Scorpion bite	01(6.6)
Acid ingestion	01 (6.6)

Table 5: Severity and outcome of poisoning.

Parameters		n (%) (n=97)
Severity of the poisoning cases (n=85)		
Grade - 1 (Low severity)		84 (98.8)
Grade - 2 (Moderate severity)		01(1.2)
Severity of snake bite (n=12)	Level 0	7 (58.3)
	Level 1	4 (33.4)
	Level 2	00
	Level 3	1 (8.3)
Outcome of poisoning cases		
Recovered		96 (98.9)
Secondary complications		01 (1.1)

DISCUSSION

The present study was conducted at two hospitals located in Northern Emirates of U.A.E. One of the hospitals was a secondary care hospital, which caters adult patients, while another one was a tertiary care hospital, which caters both adults and pediatric population. Prevalence of poisoning was almost similar between the two genders. However, several studies have reported a male predominance over female and good numbers of studies have also reported a female predominance over male.[19-22] The reason for this difference in the findings could be due to the difference in the geographical region of poisoning and the accessibility or exposure to poisoning agent.

In the present study, higher rate of accidental poisoning was documented compared to suicidal/intentional poisoning. Present findings were in accordance with the findings of other studies, which reported the highest number of accidental poisoning.[23,24] However, many studies have reported a predominance of intentional or suicidal over accidental poisoning.[19-22] The reason for the higher rate of accidental poisoning could be due to the nature of the study sample, which included data of poisoning related admissions of children.

It was very evident in this study that all the poisoning related hospital admissions in children were accidental in nature. These findings were in accordance with the findings of other studies, which reported the highest number of

accidental poisoning in children.[15] The reason for the higher number of accidental poisoning in children could be due to inappropriate storage practices of drugs or hazardous household products that may contribute for poisoning at home-setup. Unlike intentional poisoning, accidental poisoning could be prevented to a certain extent by appropriate labelling and maintaining safe storage and disposal practices and educating the general public the safety and first-aid procedures.[15,25]

Higher number of poisoning related hospital admissions were documented in the age group of 21 to 30 years. In which 19 cases were due to intentional poisoning and 10 were due to accidental poisoning. The possible reasons for this could be due to increase in work stress, marriage responsibilities and escalated arguments with family members in this age group. These findings were in accordance with the findings of other studies, which reported higher rate of suicidal poisoning in this age group.[20,23,26]

Considering the occupation, higher incidence of poisoning cases was documented in the working group (employees) followed by students. Present findings were in contrast to the findings of a study, which reported higher incidence in student population.[26] Higher incidences of suicidal poisoning were documented in housewives in comparison to other occupations. This finding was in agreement with other findings, which documented higher rate of suicidal poisoning among housewives.[27] The occupation of the population varied from studies to studies, depend upon the geographical location of poisoning. Studies from developing countries have reported prevalence of poisoning in farmers, unemployed or housewives.[26,28]

Some of the patients had a history with drug overdose as well as psychiatric illness. Depression and other psychiatric disorders have been reported as risk factors for intentional or suicidal poisoning.[29] The majority of the cases were admitted to the hospital within less than two hours of the incidence or exposure to poisoning. Time elapsed between exposure to poison and hospital admission is found to be an important factor determining the survival rate. Studies have reported a higher mortality rate when elapsed rate is more than two hours.[30] Shorter the time gap between the poison exposure and the admission to hospital, higher the survival rate. Due to easy accessibility and the reachability of the hospitals in this region could be reason for a shorter elapsed time in this study.

Paracetamol followed by a cocktail of medications were the most common cause of poisoning. Many studies have reported paracetamol as the most common poisoning agent consumed both by adults and children.[6,8,19] This could be due to easier availability, lack of knowledge or misconceptions about safety, inappropriate storage practices could be the reason for the higher number of poisoning due to paracetamol. Types of agents involved in poisoning are found to be different in studies. However, studies from developing countries have reported higher rates of poisoning due to insecticide and pesticides such as organophosphorus, organ-carbamates and organochlorine compounds.[21,28,30] Snakebite poisoning cases were reported only in males, as in most cases males were working on the farm were bitten by the snake. No mortality has been reported with snakebite poisoning in this study. However, few studies have reported mortality in snake bite cases due to respiratory paralysis and hemorrhage.[20,30]

There were nine cases where household products were implicated in poisoning, four cases were due to Clorox® bleach ingestion, two cases of liquid detergent ingestion and one case of Dettol® ingestion as well as in one case which includes a combination of both Clorox® and Dettol® ingestion. This finding could be due to the easy availability of such products in every house and the easy accesses to such products to improper storage practices. Few studies have reported accidental poisoning in children due to hazardous household products.[15]

Since, the majority of the poisoning cases of this study were of low severity, might have contributed for the shorter hospital stay. Few studies have reported longer hospital stay associated with poisoning cases. This could be due to the toxic nature of the poisoning agent such as insecticide or pesticide poisoning, or venomous snake bite, which requires longer duration of treatment.[31]

Compared to the findings, few studies have reported severe to fatal for poisoning agents and grade three in case of snakebite poisoning.[32] The higher grade of severity level could be due to the nature of the agent implicated in poisoning. A five-year retrospective study, which assessed the risk of poisoning in children, has reported minor poison severity scores among children who admitted to hospital due to accidental chemical poisoning.[33]

The outcome of poisoning was a recovery in the majority of the cases, except in one case, which developed a secondary complication such as pneumonia due to carbon monoxide poisoning. Earlier studies have reported secondary complication such as pneumonia in carbon monoxide poisoning.[34] There was no single mortality documented due to poisoning in this study. This finding of this study was in contrast to the findings of many other studies, which reported higher mortality rate due to acute poisoning.[5,6,16,32] This difference in the findings could be due to the difference in the type agent involved in poisoning, since in many of the studies death reported due to poisoning due to exposure to highly toxic substances such as insecticide or pesticides. In addition, shorter elapsed time period and easy access to the medical care facility could be the reason for higher recovery rates.

It is noteworthy to mention that demographic parameters such as gender, as gender, age, nationality and occupation were found to be associated with the intention of poisoning and type of poisoning agent. Few studies have documented factors such as gender and marital status correlating with the intention of poisoning.[35]

The findings of the present study may not represent the actual scenario of type, incidence, nature and outcome of poisoning cases among the entire UAE due to the small sample size and shorter study duration. Another limitation was due to scarcity in the published local data regarding patterns of poisoning related admissions in the hospitals, hence, author could not compare these findings with the available local data.

CONCLUSION

The prevalence of poisoning was almost similar between both the genders. The majority of the poisoning cases were of accidental type. Paracetamol was the most common drug implicated in poisoning. The outcome of the poisoning was a recovery in the majority of the cases and no mortality were reported. The present study emphasizes the need of educating the general public regarding the appropriate storage and the use of over the counter medications such as paracetamol and household hazardous products in order to minimize the incidence of poisoning. Pharmacist can contribute in a greater way in educating the general public regarding first-aid, appropriate labelling, storage and disposal practice of medicines and hazardous household products.

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