

Evaluation of Poisoning Patterns in Aswan Governorate in the period from 1st of June 2017 to 31st of December 2017 (Prospective Study)

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ABSTRACT

Background: Poison exposure is a major health problem. It represents a main cause of acute medical illness in developed countries and one of the main causes of mortality in developing countries.

Objective: This study done to assess the pattern of acute poisoning with drugs, chemicals and natural toxins in both adults and children in Aswan governorate, Egypt.

Subject & Methods: This study conducted prospectively at Aswan University Hospital from 1st of June 2017 to 31st of December 2017.

Results: This study included 3841 acute poisoned cases presented to Emergency Department (ED). There were 31.08% young adults, 25.15% school- children and 14.79% preschool children. Number of males with toxic exposure was 2035 while that of females was 1806. Animal envenomation was the most common cause of poisoning in adults and children. 3708 patients managed in and released from the emergency department and 129 patients hospitalized and admitted to internal medicine department. The mortality rate was (0.14%) only. Animal stings was predominant in male than female patients, while poisoning with chemicals and drugs was predominant in female than males.

Conclusion: Exposure to poisons is still a significant cause of morbidity. Regarding the high prevalence of animal envenomation in children and adults, implementation of legislations to safeguard against these animals and availability of specific anti-venom is recommended.

Keywords: prospective, animal envenomation, accidental, toxicology.

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I. INTRODUCTION

Throughout the day, a person may expose to different substances through various routes like ingestion, inhalational, injection or contact routes. If these substances affect harmfully on human life, it is considered as a poisonous substance (Thomas and John, 2007). Although expanding industrialization and advancing technology highly modernize the human life, it leads to progressive flooding of these agents in the environment, workplace and home such as industrial chemicals, pharmaceuticals and natural toxins (Keiko et al., 2010).

As poisoning pattern differs from country to another depending on a variety of factors such as availability of a particular poison, educational and health standard of this

country (Linder and Burns ., 2018). Therefore, evaluation of poisoning pattern in a particular area as regard the nature and magnitude of the poisoning cases is very important for early diagnosis and prompt treatment of these cases in this country (Klassen and Doull ., 2000).

In Egypt, Poisoning is considered an important public problem. Easy availability of street drugs and cleaning products, wide use of pesticides, ignorance of hazards of household detergents, and wide spread of envenoms animals are the main important factors in poisoning problem (Seif et al., 2016).

Epidemiological data on poisonings in Aswan governorate is extremely limited, so a prospective study will be carried out at the emergency department of Aswan university hospital in Aswan governorate in the period from 1st of June 2017 to 31st of December 2017.

The continuous increase in number of poisoned

cases and its complications received by this hospital in Aswan requires continuation of epidemiological studies about pattern of poisoning in this city to give the overall conclusion about pattern of poisoning in Aswan governorate and put recommendations for it.

II. Subject & methods

This study carried out at Aswan University Hospital, Aswan Governorate, Egypt. All poisoned cases admitted at the emergency department of Aswan University Hospital in the period from 1st of June 2017 to 31st of December 2017 recorded without exclusion and statistically analyzed. A specially designated sheet used which included: patient demographics (age, gender, occupation and residence), time of admission, and type of poisoned agent, manner of poisoning (intentional or unintentional), place and time of poisoning, route of exposure,

therapeutic intervention and outcome (discharge after observation for short periods (6 hours), admission or death).

All data were analyzed and tested by using SPSS (The Statistical Package for Social Sciences) software package version 20.0 where, P value <0.05 was considered statistically significant.

III. Results

This prospective study involved 3841 intoxicated cases, which represented about 84% of total cases admitted to ED of Aswan University Hospital from 1st of June 2017 to 31st of December 2017.

Regarding age distribution of the poisoned cases, it revealed that the highest frequency of poisoned cases reported in age group of young adults (the age from 18 to 29 years) followed by school- children (age from 6 to 17 years) then preschool children (less than 6 years). (**Table 1**).

Table (1): Age distribution of the studied poisoned cases during the period from June to December 2017.

Age distribution	Number of cases 3841	Percentage
< 6 (preschool children)	568	14%
6 -17 (school children)	966	25%
18 -29 (young adults)	1194	31%
30 – 39 (adults)	462	12%
40 – 59 (middle age)	513	13%
>60 (elderly)	138	3%
Mean ± SD	26.34±16.14	
Range	1-87	

As regard gender distribution of the poisoned cases, it revealed that 53% of cases were male, while 47% were females. (Table 2).

As regard residence distribution of the poisoned cases, it revealed that the highest frequency of cases 86% lived in rural areas (Fig 1).

As regard occupation of the poisoned cases, this study revealed that 45.27% of cases were students (from age of 7 – 24 years). (Fig 2).

Table (2): Gender distribution of the studied poisoned cases during the period from June to December 2017.

Gender distribution	Number of cases	Percentage
	3841	
Male	2039	53%
Female	1802	47%

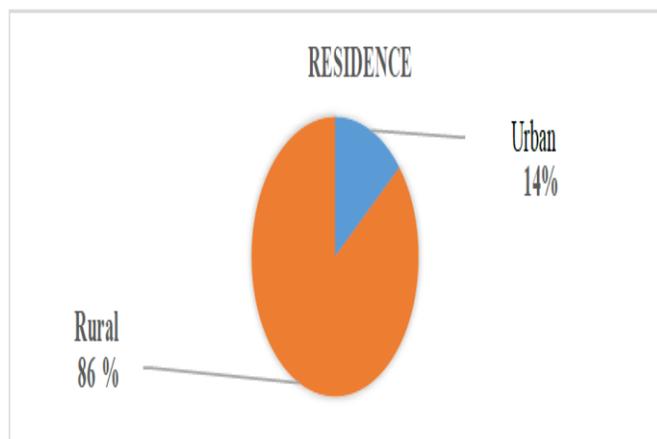


Figure (1): Bar chart showing residence distribution of the studied poisoned cases during the period from June to December 2017.

As regard seasonal distribution of the poisoned cases, it revealed that the high prevalence of cases occurred in summer months mainly in August (23.66%). (Fig 3).

As regard the manner of poisoning. It revealed that the majority of poisoned cases (98%) exposed to poisons accidentally. (Fig 4).

It was found that animal sting represented the main cause of poisoning and accounted for

(96.75%) of these cases. (Table 3).

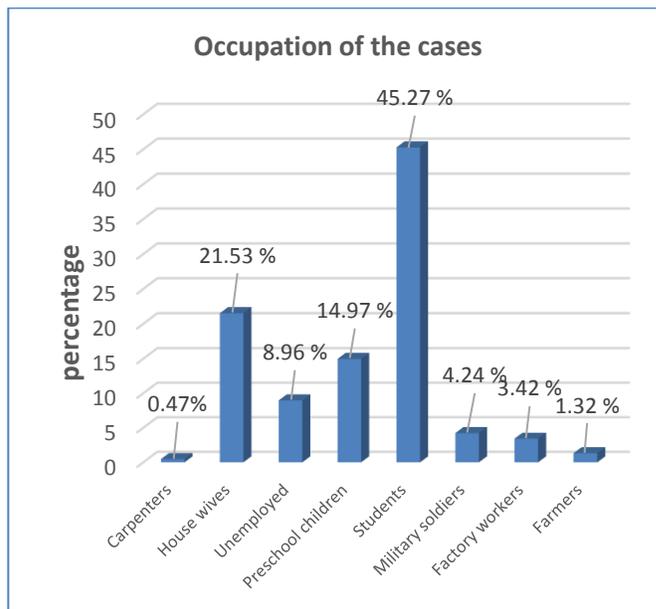


Figure (2): Bar chart showing occupation of the studied poisoned cases during the period from June to December 2017.

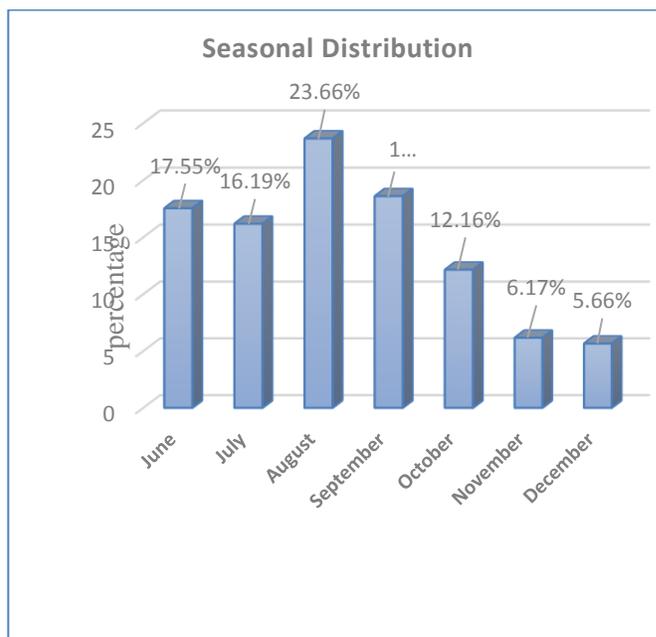


Figure (3): Bar chart showing seasonal distribution of the studied poisoned cases during the period from June to December 2017.

Regarding routes of poisoning, it revealed that the majority of poisoned cases (96, 75%) poisoned by sting or biting route, followed by ingestion route 2.96% and by inhalational route 0.26%.

Among all poisoned cases, there was only one case poisoned through dermal exposure (Fig 5).

It was found that, there were two types of animals responsible for most of poisoned cases in this study including Scorpions (99.78%) and snakes (0.22%) (Table 4).

Also, it was found that (57.2%) of chemical poisoned cases were due to hair dye products. (Table 5).

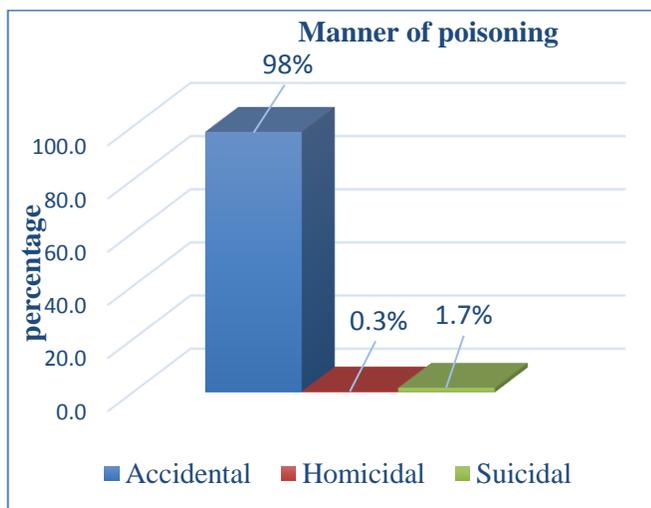


Figure (4): Bar chart showing manner of poisoning in the studied poisoned cases during the period from June to December 2017.

As regard types of drugs integrated in poisoning evaluation in Aswan governorate. It revealed that most cases of drug poisoning were mainly due to medical drugs mainly contraceptive pills, followed by hypnotics. Only one case poisoned with overdose of tramadol. (Table 6)

Regarding the relationship between causes

of poisoning and age of patients. It revealed that animal sting was the main cause of poisoning in all age groups, followed by chemicals and drug poisoning. (Fig 6).

Also, it was found that animal stings were predominant in male than female patients, while poisoning with chemicals and drugs was predominant in female than males (Fig 7).

Regarding the clinical manifestation of poisoned cases. It revealed that 46.86% of cases presented with history only and no symptoms. The rest of cases presented with symptoms like gastrointestinal (20.83%), neurological (13.27%), respiratory (11.71%), cardiovascular (6.21%) and skin manifestation (1.12%). (Table 7).

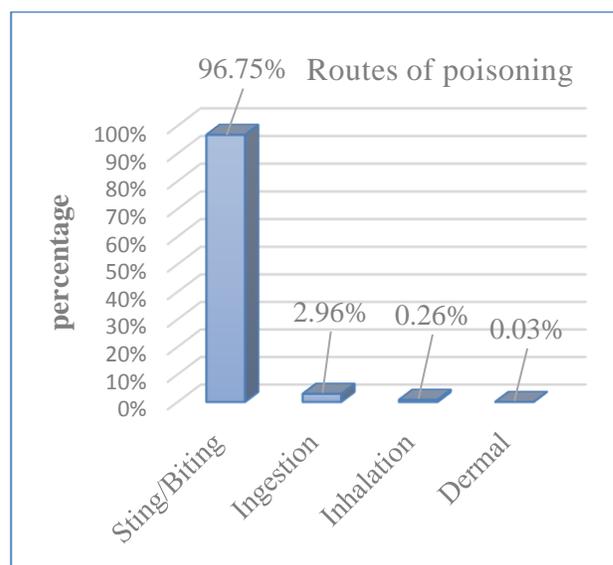


Figure (5): Bar chart showing routes of poisoning in the studied poisoned cases during the period from June to December 2017.

Table (3): Percentage of different toxic agents among studied poisoned cases during the period from June to December 2017.

Cause of poisoning	Number of cases 3841	Percentage
Animal sting	3716	96.75%
Chemical agents	105	2.73%
Drugs	18	0.47%
Unknown	2	0.05%

Table (4): Types of venomous animals in the studied poisoned cases during the period from June to December 2017.

Types of venomous animals	Number of cases	Percentage
Scorpion	3708	99.78%
Snakes	8	0.22%
Total	3716	100.0%

Table (5): Types of chemical agents in the studied poisoned cases during the period from June to December 2017.

Types of chemical agents	Number of cases	Percentage
Hair dye products	60	57.2%
Hydrocarbons	2	1.9%
Insecticides	10	9.5%
Rodenticides	12	11.4%
Caustics	21	20%
Total	105	100.0%

Table (6): Types of drug poisoning in the studied poisoned cases during the period from June to December 2017.

Compound	Compound category	Number of cases
Ethinyl-Estradiol	Combined Contraceptive Pills (COCs)	8
Phenobarbital	Hypnotic	3
Metformin	Anti- diabetic	2
Propranolol	Beta Blocker (BB)	1
Aspirin	Analgesic	1
Tramadol	Abused drug	1
Diphenhydramine	Antihistaminic	1
Amlodipine	Calcium Channel Blocker(CCB)	1
Total		18

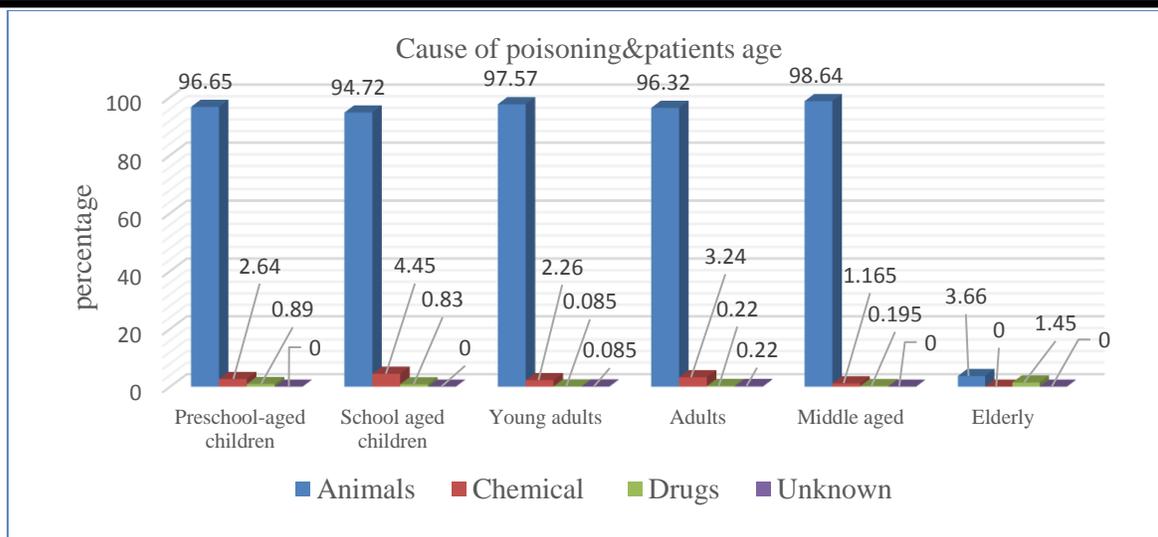


Figure (6): Bar chart showing the relationship between causes of poisoning and patients age during the period from June to December 2017.

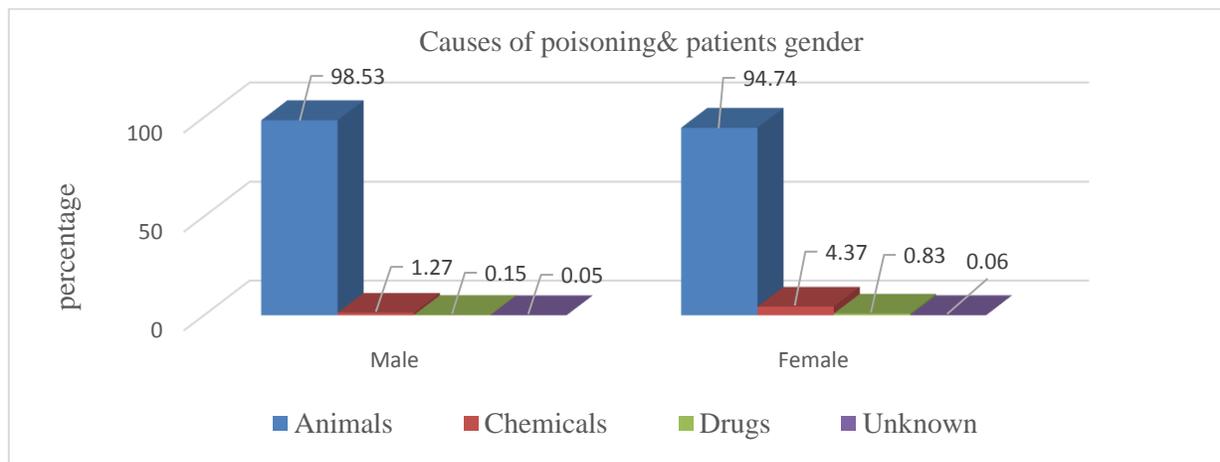


Figure (7): Bar chart showing the relationship between causes of poisoning and gender of patients during the period from June to December 2017.

Table (7): Clinical manifestation of poisoned cases during the period from June to December 2017.

Clinical manifestation	Number of patients 3841	Percentage
Gastrointestinal	800	20.83%
Respiratory	450	11.71%
Cardiovascular	200	6.21%
Neurological	510	13.27%
Skin	81	1.12%
No symptoms	1800	46.86%

Also, it was found that the majority of poisoned cases were normotensive (98.21%), with normal pulse rate (99.2%), respiratory rate (99.22%) and temperature (99.07%). (Table 8).

As regard investigations performed to the poisoned cases. It revealed that renal and liver function tests performed for 3.14% of the cases and random blood sugar performed for 1.56% of the cases. While arterial blood gases and complete blood picture only performed for 0.8% -0.34% of the cases respectively. (Table 9).

As regard therapeutic interventions offered to the poisoned cases. Decontamination procedures in the form of gastric lavage accomplished on 2.19% of cases. Enhanced elimination in the form of activated charcoal was administered for 105 cases while hemodialysis was administered for 8 cases who poisoned with hair dye ingestion. Antidotes

treatment accounted for 97.3% of cases. Mechanical ventilation was needed in 2 cases only of the ICU cases. Eight cases of hair dye ingestion required endotracheal intubation. Supportive treatment like steroids administered to 73 cases (Table 10).

Also, it was found that period of hospitalization was less than 6 hours for the largest number of patients (96.54%) reflecting the mild severity of poisoning. In 0.73% of patients, the period of stay was 6 - 24h, and in 0.75%, it extended more than 2days. (Table 11).

As regard the outcome of poisoned cases. It revealed that about 3708 patients (96.5%) managed in and released from the emergency department and about 129 patients (3.36%) hospitalized and admitted to internal medicine department. The mortality rate was (0.14%) only (Fig 8).

Table (8): Vital data of poisoned cases during the period from June to December 2017.

Vital data of the poisoned patients		Number of patients 3841	Percentage
Blood Pressure (mmHg)	Normotensive	3781	98.21%
	Hypotensive	60	1.79%
Pulse rate (beat/min.)	<60	9	0.25%
	60-100	3811	99.2%
	>100	21	0.55%
Body temperature (0c)	<36.5	23	0.59%
	36.5-37.2	3826	99.07%
	>37.2	13	0.34%
Respiratory rate (cycle/min)	<20	0	0%
	20-40	3811	99.22%
	>40	30	0.78%

Table (9): Investigation performed to acutely poisoned cases during the period from June to December 2017.

Investigations	Number of patients 3841	Percentage
Renal function test	131	3.14%
Liver function test	131	3.14%
Complete blood picture	13	0.34%
Random blood glucose	60	1.56%
Arterial blood gases	30	0.8%

Table (10): Interventions offered to acutely poisoned cases received in ED during the period from June to December 2017.

Type of intervention		Number of the cases	Type of intervention	Number of the cases	
Decontamination	Syrup of ipecac	0	Emergency treatment	Oxygen	1356
	Gastric lavage	84		Endotracheal intubation	8
Enhanced Elimination	Activated charcoal	105		Mechanical ventilation	2
	Hemodialysis	8	Supportive treatment	Anti-emetics	21
Antidotes	Scorpion anti-venom	3708		IV Fluids	10
	Snake anti-venom	8		Steroids	73
	Atropine	22	Antibiotics	13	

Table (11): Period of hospitalization of poisoned cases during the period from June to December 2017.

Period of hospitalization	Number of patients 3841	Percentage
< 6h	3708	96.54%
6h - 24h	28	0.73%
1-2days	76	1.98%
2-3days	25	0.65%
More than 3days	4	0.1%

poisoned cases during the period from June to December 2017.

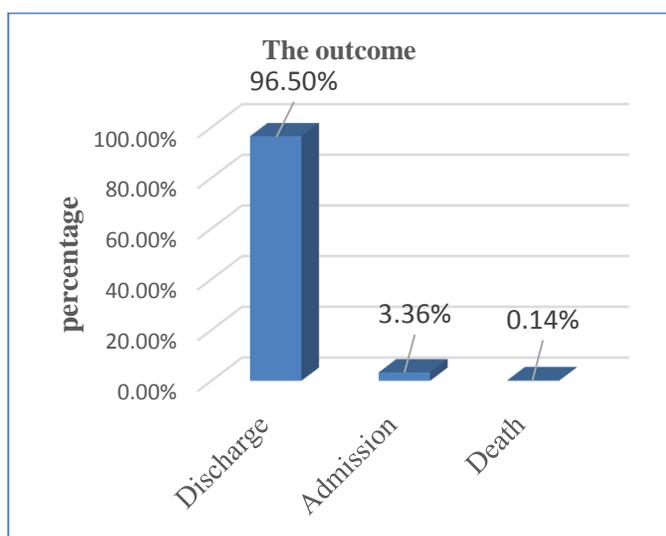


Figure (8): Bar chart showing outcome of the studied

Also, it was found that (99.87 %) of poisoned cases who discharged to home following an initial ED evaluation were due to poisoning by animal stings while there were 13 poisoned cases with animal stings were admitted to ICU with cardiac arrhythmia and hemolysis.

About 75.19% of poisoned cases who admitted in the internal medicine department were due to poisoning with chemicals. However, four cases of these poisoned with chemicals were discharged to home following an initial ED evaluation and four patients died. All dead cases were due to hair pigment poisoning. First two cases were females of 37 & 25 years old respectively, and suffered

from intentional exposure.

They treated in the hospital for 2 days prior to death. Acute renal failure and laryngeal edema were the immediate cause of death. The other two cases were 4 & 10 years old male children respectively presented with acute laryngeal edema due to accidental exposure to hair dye. All cases poisoned with medical drugs admitted to the hospital for 2-4 days. (Fig 9).

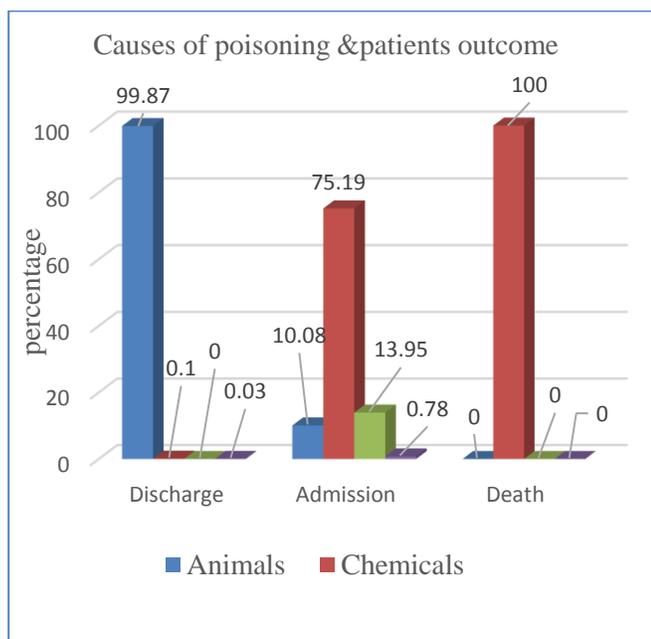


Figure (9): Bar chart showing the relationship between the causes of poisoning and the outcome of cases during the period from June to December 2017.

IV. Discussion

Occurrence of 3841 cases of poisoning in only one hospital over a period of 7 months emphasized the seriousness of the problem of poisoning in Aswan governorate. It was difficult to estimate the total number of poisoned victims in Aswan, because there was no centralized data collection and there were many hospitals where most poisoned patients were managed.

In this study, it was found that the poisoning peak were among young adults

(31.08%). This age group found to be the most attempted number of poisoning in many of the poison studies conducted in many countries like Turkey and India (Ayoglu et al., 2009; Sam et al., 2009). This could be due to the reasons that this age group peoples are more prone to work pressure, love failure, marriage problem and other obstacles.

The percentage of males (53%) exposed to poisons largely outnumbered the females (47%). This could be due to the reason that men more often exposed to the occupational threats than the females. This observation is in agreement with previous study performed in Al - Wattani governmental hospital in Palestine, which showed that male patients represent 59.2% of all cases with male: female ratio of 1.5: 1 (Ansam et al., 2010).

The vast majority of poisoned cases in this study (86%) were from rural areas and only (14%) of cases were urban residence. These results agree with data from Assiut governorate where 82.6% of cases were rural residence while 17.4% were urban residence). This is attributed to the higher magnitude of the poisoning health problem in rural areas, wide distribution of envenoms animals, wide use of pesticides, low awareness of people about safe keeping of drugs and household products away from children and preference of urban residence to go to private clinics rather than hospitals (Abd-elrahman et al., 2014).

The primary etiologic factor for intoxication in this study was animal stings (96.75%) followed in frequency by chemicals (2.96%) and Pharmaceuticals poisoning (0.26%). Aswan environment is the home for many animal species including snakes, scorpions and other insects. Scorpion sting was the dominant subgroup in outpatients. Most scorpion species in Aswan Governorate are not the most heavily degraded species on the human body because most of them have only local effects; so many cases poisoned with scorpion stings do not need admission and only received anti venom in the emergency department (Salama and Sharshar.,

2013).

This pattern was in agreement with (Abdelrahman et al., 2014) which found that animal sting was the main cause of poisoning in Assiut governorate followed by food poisoning, drugs, chemicals, and unknown substances respectively. In this study, poisoning by chemicals represented 2.73% of all cases. Most of these cases were poisoned with hair dye products which represented 57.2% followed by corrosives which represented 20% then pesticides which represented 11.4% for rodenticides and 9.5% for insecticides, and hydrocarbons which represented 1.9% of the cases.

This study revealed that hair dye products were the main cause of poisoning with chemicals. The majority of cases were female (85%) patients and involved the age of school-aged group (45%) which are in agreement with the results of a previous study which showed that about a fifth of the acute poisoning fatalities investigated by Assiut forensic chemical laboratory were due to ingestion of hair dye. The highest majority of them were suicide cases, particularly in Qena, Sohag and Aswan Governorates respectively, with a female predominance (Abdelmonem., 2017).

These results revealed that the bite/sting route was the most common route of poisoning which represented 96.75%. This was consistent with the result which revealed that the highest percentage of poisoning cases caused by animal poisoning especially scorpion sting, followed by oral route which represented 2.96% then inhalation route which represented 0.26% and finally dermal route which represented 0.03% (Abdelrahman et al., 2014) .

Most of the cases included in this study were because of unintentional poisoning (3770 case, 98%), while the rest were intentional type, suicidal and homicidal manner (1.7% - 0.3% respectively). Results of this study agreed with previous study in other governorates in Egypt.

In Ismailia, (Al-Kassabi et al., 2010) found that 81.4% of cases were accidental and 18.6% were suicidal.

Most patients (96.5%) do not need hospital admission. They were only received simple symptomatic treatment or specific antidote for scorpion and snake in the emergency department and only a small percentage of the cases required admission. This indicates that the degree of poisoning was not severe one and did not require hospital admission. This study was in concordance with (Ansam et al., 2010) where the majority (91.1%) of cases did not undergo any decontamination and only treated as outpatients.

V. Conclusion

There is a continuous increase in the number of poisoning cases, especially among young adults because of the increase in population, wide distribution of venomous animals due to the nature of the geographic area of Aswan governorate that helped spread of scorpions and snakes and the increase in the use of drugs and chemicals especially hair dye.

VI. Recommendations

1. Efforts should be recommended to make the first aid measures.
2. Specific antiserum should be available in primary care Centers and all hospitals.
3. Spaces under houses and boardwalks should be tightly enclosed and sprayed regularly with insecticides.
4. Rubbish should not be left scattered where children play.
5. Magnitude problem of poisoning with hair dye should be studied on a national basis to decrease its morbidity and mortality.

VII. References

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تقييم أنماط التسمم في محافظة أسوان في الفترة من 1 يونيو 2017 إلى 31 ديسمبر 2017 (دراسة مستقبلية)

صفاء ماهر جورج¹, هبة عطية يسى¹, أمنية حسنى محمد د²

1 قسم الطب الشرعي والسموم الاكلينيكية جامعة أسيوط

2 قسم الطب الشرعي والسموم الاكلينيكية جامعة أسوان

يعد التعرض للسموم مشكلة صحية رئيسية لأنه أحد أكثر الأسباب الشائعة للإصابة بالأمراض الطبية الحادة في البلدان المتقدمة، وثاني أكثر أسباب الوفاة شيوعاً في البلدان النامية.

الهدف: أجريت هذه الدراسة لتقييم نمط التسمم الحاد بالأدوية والمواد الكيميائية والسموم الطبيعية لدى البالغين والأطفال في محافظة أسوان بمصر.

طرق البحث: تم إجراء الدراسة مستقبلاً بمستشفى جامعة أسوان من 1 يونيو 2017 إلى 31 ديسمبر 2017

النتائج: شملت هذه الدراسة 3841 حالات تسمم حاد تم التعامل معها بقسم الاستقبال والطوارئ بمستشفى اسوان الجامعي منهم 31.08% من الشباب و25.15% من تلاميذ المدارس و14.79% من الأطفال قبل سن المدرسة. كان عدد الذكور ف هذه الدراسة 2035 في حين أن عدد الإناث كان 1806. وكان التعرض للدغات الحيوانات السامة هو السبب الأكثر شيوعاً للتسمم عند البالغين والأطفال. تمت فحص وملاحظه 3708 مريضاً وعلاجهم في قسم الطوارئ وتم نقل 129 مريضاً إلى قسم الباطنة الداخلي. كان معدل الوفيات (0.14%) فقط. كانت للسعات الحيوانية هي الغالبة في الذكور أكثر من المرضى الإناث، في حين كان التسمم بالمواد الكيميائية والمخدرات هو السائد في الإناث أكثر من الذكور.

الاستنتاج: لا يزال التسمم العرضي يشكل سبباً مهماً للمرض. وفيما يتعلق بزيادة انتشار التسمم بالدغات الحيوانية السامة لدى الأطفال والبالغين مما يوصى بتنفيذ التشريعات اللازمة للحماية ضد هذه الحيوانات وتوافر مضادات السموم الخاصة بهذه الحيوانات في جميع مستشفيات محافظة اسوان.