

2011 Annual Report of the Poison Control Centre of Ain Shams University Hospital, Cairo, Egypt

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Abstract **Background:** Poisoning is a growing public concern and real potential threat to the Egyptian community. The Poison Control centre (PCC), Ain Shams University, the first and larger in Egypt and the Middle East managed and treated more than 21.000 patients on the year 2011. **The aim of the study** is to highlight the profile of poisoning in Poison Control Center Ain Shams University (Egypt) to facilitate the recognition of the different threats to which the Egyptian community is exposed. **Methods:** Computerized data of a specially designed program comprised demographic in addition to clinical and management data of the poisoning cases received in PCC on the year 2011. A descriptive analysis and statistics of the medical records is accomplished. **Results:** Overall, 21.550 poison exposure cases were recorded. Children under 7 years old were involved in 23.9% of cases, patients at group of age 15-40 years involved in 62.8%. In 49% of patients, the poisoning was deliberate. Attempted suicide was definitely more common in females and started as early as the pubertal age. Substances most frequently involved were food poisoning, organophosphate, cleaning products and tramadol that almost doubled yearly over the last few years. Clinical severity was mild in 75.1% of cases, 20.7% was moderate and 4.2% was severe. Sixty one fatalities were recorded. Management of these cases was described **Conclusions:** Specific attention has been drawn towards attempted suicide in adolescents and early adulthood, the younger age of drug users and the progressive increase of some of drugs of abuse and the changing pattern of poisoning over years.

Introduction

Poisoning exposure is an increasingly public concern due to the progressive flooding of chemicals, pharmaceuticals and natural toxins in the international markets and people agglomerations. Factors enhancing this poisoning epidemic expansion are multiple and complex in any country. Poison Control Centre (PCC) is witnessing a continuously changing poisoning pattern closely reflecting the changing industry, economy, and social configurations. The wide availability of chemicals and medications has led to increased exposure of humans to potential poisons. An unavoidable result has been an increase in the number of poisonings – a leading cause of injury-related fatalities (Clark, 2004).

Since the beginning of the twentieth century industrialization and technological advancement have resulted in an exponential growth in the number of chemicals introduced into the environment, workplace and home. These include medications, complementary medicine products, cleaning substances, pesticides,

fertilizers, petroleum distillates, intermediates in chemical processes, and drugs of abuse (Wax, 2006).

The information released by the poison control centre has always been a trigger for laws and regulations revision and a warning for an increasing hazard challenging the community.

Despite the continuous update of information on poisons and intoxications, several problems have yet to be resolved: a) there is still insufficient awareness regarding the potential hazards of poisons, b) physicians are still not adequately trained in clinical toxicology, and c) keeping pace with the increasing amount of information has not always been possible due to its huge volume, limited availability and insufficient clinical exposure (Hoffman, 2007).

Aim of the work

The objective of this study is to help identify the magnitude of poisoning and its patterns. Interpretation of the poisoning data through an annual report would be essential to face continuously challenging hazards

of variable magnitude and appearance. Analysis of data on the epidemiology of poisoning and poison exposures in an annual report will enable us to issue warning reports and invite the health authorities to advocate steps towards preventive regulations for the welfare of for the community.

Methods

The total number of poisoning cases and environmental toxic exposures amounted to 21,550 patients over a 12-month period (from start of January 2011 to end of December 2011). This number represents the actual poisoning cases referred to the Poison Control Centre in Ain Shams University Hospitals, from different governmental, private hospitals and medical centres in the region. The demographic and clinical management data collected throughout the study period were tabulated and statistically analysed.

The clinical severity of each case was graded according to previously published criteria (Persson et al., 1998) as mild (e.g., minimal, self-limited); moderate (e.g., systemic, more pronounced and prolonged than minor manifestations but not life threatening); and severe (e.g., life-threatening manifestations, significant disability).

In addition, each case was classified according to drug, non-drug and unknown. The drugs include various types of drugs available in Egypt and include also drug of abuse agents. The non-drug involved food poisoning, chemicals, biological (poisonous plants and venomous animals), gases, metals and miscellaneous agents.

Results

Age and sex distribution revealed that the largest poisoning affection was at the age group of 15 - 25 years accounting for 39% of total cases with female preponderance, followed by the age group <7 with male predominance (Table 1).

Most of cases originated from greater Cairo (69%) followed by the nearby Kalioubeya (15.5%) and Guiza (12.4%) governorates (Table 2). Referral from other general, private hospitals or clinics was documented in 3% of cases.

Route of poisoning was mostly oral in 94.9% of cases. Other routes included inhalation in 2.7% of cases, bites and stings in 2.2%, dermal route in 0.1%, and injection in 0.1% of cases (Table 3).

Study of the mode of poisoning disclosed attempted suicide in 49% of the cases. Accidental mode of poisoning was next in frequency and accounted for 42.7% of cases followed by drug overdose in 7.5%, therapeutic error in 0.4% and criminal cause in 0.4% of cases (Table 4). Moreover 73% of the attempted suicide was in female and 69% was at the age between 15 - 40 years. Alarming figures revealed attempted suicide in 450 patients between 10 to >15 years of age mostly female (77% of those who

attempted suicide in this age group). On the other hand 5021 out of 5150 cases (97.5%) of the age group below 7 years of age were caused by accidental exposures.

Pharmaceuticals were responsible for 46.7%, non-drugs chemicals and environmental hazards represented 45.3% while in 8% of cases, poisoning was of unknown etiology (Table 5).

The most frequently involved drug was tramadol (responsible for 7.4% of the total poisoning cases), followed by theophylline (4.2%), antibiotics (3.7%), NSAIDs (3.6%), paracetamol (2.9%) and benzodiazepine (2.9%) (Table 6). Tramadol was responsible for 176 children less than 15 years of age (11% of all tramadol cases). It was responsible for 706 intoxications in the age group between 15 and < 25 years (44.2% of all tramadol cases). Unexpected results revealed that 29.8% (90 out of 302 cases) of cannabis intoxication occurred in the age group below 2 years of age.

Amongst the non-drug poison, the highest percentage was related to food poisoning (14%), while organophosphate and carbamate insecticides constituted 11%, followed by corrosive (6.5%), and zinc phosphide (3%) (Table 7). Agents most frequently involved in children < 7 years, were corrosive (18%), organophosphate (14%) and detergents (13%) (Table 8).

Poisoning severity was mild in the majority (75.1%) of cases, moderate in (20.7%) and severe in (4.2%) (Table 9).

Death occurred in sixty one cases (0.3%). The leading cause of death was organophosphate (20 cases), followed by tramadol (9 cases), corrosive (4 cases) and methanol (3 cases). The other causes of death from different poisons are displayed in (Table 10). One third of all cases died within the first day. In another third of cases, death supervened after a prolonged period of stay more than 5 days underlying an irreversible cause of death as brain stem death in the majority.

Period of hospitalisation was less than 6 hours for the largest number of patients (75.1%) reflecting the mild severity of poisoning. In 18.2% of patients the period of stay was 6 - 24h, in 4.6% of the patients was from 1-2 days and in 2.1% it extended more than 2 days (Table 11).

Decontamination procedures were accomplished on 32.6% of cases either in the form of gastric lavage or ipecac emesis. Enhanced elimination in the form of activated charcoal was administered for 10.1% while hemodialysis was the mainstay treatment of 23 cases, half of them were due to severe theophylline toxicity. Antidotes treatment accounted for 4.3% of cases. Mechanical ventilation was needed in 14.8% of the ICU cases and 73% of them required the application of PEEP ventilation. Emergency and supportive treatments and other various therapies and interventions recommended by the PCC are displayed in the (Table 12).

Table 1: The age and gender distribution of poisoned cases received in PCC through the year 2011.

Age (years)	Male		Female		Total	
	No	%	No	%	No	%
<7	2931	13.6%	2220	10.3%	5150	23.9%
7 - <15	582	2.7%	711	3.3%	1314	6.1%
15 - <25	2931	13.6%	5646	26.2%	8555	39.7%
25 - 40	2478	11.5%	2500	11.6%	4978	23.1%
>40	840	3.9%	711	3.3%	1553	7.2%
Total	9762	45.3%	11788	54.7%	21550	100%

Table 2: The Residence of poisoned cases received in PCC through the year 2011.

Region	No	%
Cairo	14870	69%
Kalioubeya	3340	15.5%
Giza	2672	12.4%
Other Delta Governorates	237	1.1%
Upper Egypt Governorates	237	1.1%
Suez Canal Governorates	151	0.7%
Unknown	43	0.2%
Total	21550	100%

Table 3: The routes of poisoning of poisoned cases received in PCC through the year 2011.

Route	No	%
Ingestion / Oral	20450	94.9%
Inhalation / nasal	582	2.7%
Bite / sting	474	2.2%
Dermal / skin-scalp	22	0.1%
Injection	22	0.1%
Total	21550	100%

Table 4: Mode of poisoning of poisoned cases received in PCC through the year 2011.

Mode	No	%
Suicidal	10559	49%
Accidental	9202	42.7%
Overdose drug of abuse	1616	7.5%
Criminal	86	0.4%
Therapeutic error	87	0.4%
Total	21550	100%

Table 5: Type of causative agents of poisoned cases received in PCC through the year 2011.

Type	No	%
Drugs	10064	46.7%
Non- drug	9762	45.3%
Unknown	1724	8%
Total	21550	100%

Table 6: Drugs involved in poisoned cases received in PCC through the year 2011.

Drug	No	%	Drug	No	%
Tramadol	1595	7.4%	Oral contraceptive	172	0.8%
Theophylline	905	4.2%	Antihypertensives	172	0.8%
Antibiotics	797	3.7%	Vitamins	129	0.6%
NSAIDs	776	3.6%	Digoxin	129	0.6%
Paracetamol	625	2.9%	Unknown drug	87	0.4
Benzodiazepine	625	2.9%	Opiate	65	0.3%
Carbamazepine	431	2%	Ca channel blocker	58	0.27%
Neuroleptic	431	2%	Parkinol	44	0.2%
Beta Blockers	302	1.4%	Diuretic	43	0.2%
Cannabis	302	1.4%	Valproate	44	0.2%
Oral hypoglycemic	280	1.3%	Muscle relaxant	22	0.1%
Metformin	237	1.1%	Phenytoin	19	0.09%
Salicylate	237	1.1%	Insulin	17	0.08%
Antihistaminics	216	1%	Serotonin Reuptake Inhibitors	13	0.06%
cyclic antidepressant	213	0.99%	Miscellaneous drugs	1078	5%
Total	10064		46.7%		

Table 7: Non-drug most frequently involved in poisoned cases received in PCC through the year 2011.

Type	No	(%)
Food poisoning	3017	14%
Ciguatera	147	0.7%
Tetrodotoxin	4	0.02%
Organophosphate insecticide	2112	9.8%
Carbamate insecticide	259	1.2%
Corrosives	1400	6.5%
Zinc and aluminium Phosphide	646	3%
Kerosene and petroleum. distillate	624	2.9%
Detergents	108	0.5%
Phenol	86	0.4%
Carbon Monoxide	323	1.5%
Hydrogen sulphide	4	0.02%
Paint	6	0.03%
Paraphenylenediamine dye	11	0.05%
Alcohol (Ethanol)	302	1.4%
Methanol	17	0.08%
Animal poisoning	474	2.2%
Scorpion	194	0.9%
Snake	172	0.8%
Spider sting	1	0.005%
Unknown stings	107	0.5%
Metals	49	0.23
Iron	43	0.2%
Lead	6	0.03%
Plants and herbals	18	0.08%
Lachrymatory agent (Riot control)	21	0.1%
Miscellaneous	112	0.5%
Total	9762	45.3%

Table 8: Poisons most frequently involved in 5150 children < 7 years age received in PCC through the year 2011.

Agents	Number	%
Corrosive	927	18%
Organophosphate	721	14%
Hydrocarbon & Detergents	670	13%

Table 9: Grading of poisoning severity of cases received in PCC through the year 2011 (Persson et al., 1998).

Degree of severity	No	(%)
Mild	16184	75.1%
Moderate	4461	20.7%
Severe	905	4.2%
Total	21550	100%

Table 10: Death-related offending agents.

Agent	No	Agent	No
Organophosphate	20	Unknown	2
Tramadol	9	Neuroleptics	1
Methanol	3	Scorpion	1
Corrosive	4	Theophylline	1
Carbon Monoxide	4	Digoxin	1
Phosphide	3	Tetrodotoxin	1
Cyanamide (Dormex)	2	Salicylate	1
Benzodiazepine	2	Neuroleptic Malignant S.	1
Kerosene	2	Snake bite	1
Paraphenylenediamine dye	2		
Total	61		0.3%

Table 11: The period of hospitalisation of poisoned cases received in PCC through the year 2011.

Period of hospitalization	No	(%)	Period of hosp.	No	(%)
< 6h	16184	75.1%	4 -<5 d	22	0.1%
6h - 24h	3922	18.2%	5 - <6 d	13	0.06%
1d - <2d	991	4.6%	6-<7 d	9	0.04%
2d - <3d	281	1.3%	>7 d	64	0.3%
3d-<4d	64	0.3%			
Total				21550	100%

Table 12: Interventions offered to acutely poisoned cases received in PCC through the year 2011.

Type of intervention	No	Type of intervention	No
Decontamination (32.6%)		Emergency Treatment	
Ipecac Emesis	5178	Ambu Resuscitation	67
Gastric lavage	1844	Oxygen	1309
Enhanced elimination (10.3%)		Endotracheal intubation	301
Activated charcoal	2190	Airway suction	530
Hemodialysis	23	Supportive treatment	
Peritoneal dialysis	2	Mechanical Ventilation	134
Antidote 929 (4.3%)		Mechanical Ventilation + Positive end expiratory pressure	98
Atropine	640	IVF and Electrolytes	5502
Obidoxime	277	H2 Blockers	1234
Naloxone	97	Antibiotics	1008
Bicarbonate	81	Antiemetic	793
N-acetylcysteine	46	Steroids	411
Dextrose 25%	41	Sedative hypnotics	369
Scorpion anti-venoms	36	Nebulizer therapy	128
Snake anti-venoms	33	Mannitol	112
Ethanol	12		
Flumazenil	10		
Calcium gluconate	10		
Hyperbaric O2 therapy	5		
Methylene blue	4		
Glucagon	3		

Discussion

The PCC of Ain Shams University is the first and largest national poison treatment centre of Egypt. The annual report of the year 2011 describes a total number

of 21.550 poisoned patients managed and treated in the centre.

The results of the collected data revealed that 62.8% of poison exposures were at the age 15-40 years

while 23.9% of poison exposures were children under 7 years. The lowest incidence of poisoning was at age group 7 - < 15 years (6.1%) and over 40 years (7.2%) (Table 1). The high incidence of poisoning in the early adulthood and middle age deserve particular attention. This poisoning prone age group is subject to tremendous emotional and economic challenges in Egypt. Compared to other countries whether of Arabic or western culture revealed that the greater majority of poisoning cases usually lie in the age group below 5 years of age. The 2010 annual report of the American Association of Poison Control Centres revealed that children under age of 5 make up to 51 % of all poison exposures (Alvin et al., 2011). The Saudi Arabia Report of acute chemical poisoning during the first six months of year 2004 revealed that the highest proportion of acute poisoning was observed among children \leq 5 years of age (Moazzam et al., 2004). These observations strongly point to economic defies affecting principally the most vulnerable and conscious age group in Egypt. Other factors include interlinked emotional, social, financial and conjugal stresses.

The residence data revealed that most of cases originated from Cairo (69%) followed by Kalioubeya and Giza where they represented 15.5%, and 12.4% respectively. This is attributed to the proximity of these governorates to the PCC and not to the higher magnitude of the poisoning health problem. (Table 2).

The data result revealed that the oral route was the most common route of poisoning (94.9%) (Table 3). Andiran and Sarikayalar on 2004 found that the oral route was the most common route of poisoning and this agreed as well with results of other studies in Saudi Arabia and those issued in the 2010 annual report of the American Association of Poison Control Centres (79.5%).

It is evident from this study that attempted suicide (49%) exceeded accidental (42.7%) poisoning exposure (table 4). Most of attempted suicide was induced by females (73%). This incidence of suicide is even higher (69%) in the age group 15-40 years. A more alarming figure is the attempted suicide among the pubertal development age (10 -<15 years), the large majority of which (77%) are girls. These results are in accord with Goksu, 2002 who found that most attempted suicide poisoning cases were among teenagers and young adults, females significantly outnumber males and drugs were commonly the mode of intentional poisoning. In contrast, the 2010 annual report of the American Association of PCCs found that only 14.7 % of poisoning was intentional (Alvin et al., 2011). Despite the strong religious morals in Islam and Christianity that ban self-destruction and deliberate self-killing, yet young adults seem not immune to the attempted suicide.

Children of preschool age (<7 years) particularly male, were subjected to poisoning accidents (23.9%) more than any other age group, this can be attributed to the particular behaviour of that age group as curiosity, oral identification, discrimination inability and taste and smell immaturity. These results were similar to those of Andiran and Sarikayalar 2004 where they found that accidental poisoning was commonest amongst children and remains a significant problem for this age group.

The collected data revealed that 46.7% of the cases were due to drug poisoning and 45.3% was non-drugs poisoning (table 5), bearing a great resemblance to the data issued in the Annual Report of 2010 of the American Association of Poison Control Centres. The four most frequently involved groups of substances in all poison exposures were food poisoning (14%), organophosphate (9.8%), tramadol (7.4%) and corrosive (6.5%) (Table 6, 7) affirming different Egyptian compared to American profile of poisoning. In the United States, analgesics (11.5%) followed by cosmetics /personal care products (7.7%), household cleaning substances (7.3%), and sedatives/hypnotics/antipsychotics (6.0%) formed the highest poisoning frequency. Although the percentage of food poisoning was relatively high (14%), yet it does not reflect the real magnitude of the problem as food poisoning patients, apart ciguatera, tetrodotoxin and botulism, are not referred to PCC. The vast majority of the food poisoning cases were clinically of toxigenic type. The majority of cases were managed in the emergency rooms and released for a home treatment after a period of observation of 6 to 24 hours.

An alarming figure has been the progressive rise of tramadol overdose amounting to 1595 cases in the year 2011 compared to 386 cases in 2009 and 760 cases in 2010. These data and daily observations of the magnitude of the problem enabled the PCC Ain Shams to declare new recommendations concerning drug of abuse screening list and issue several warnings in media that were given much concern by the health and drugs of abuse authorities.

Exposure to animal stings and bites were of relatively low percentage in the present study (2.2%). Almost a third of snake bite originated from Guiza, Bahareya oasis (all viperidae type), a third from close governorates (mainly elapididae type) and the last third from greater Cairo. Scorpion stings most serious clinical presentation was in the children groups. They mainly originated from suburban, rural areas and growing new cities that invade the territories of scorpions and snakes. Despite the severity of animal exposure, the outcome was relatively satisfactory with a mortality of 0.5%. This was attributed to the availability of anti-venom and strict guidelines

concerning these exposures emergencies in our centre and non-aggressive species especially in scorpion. A smaller mortality is declared in the 2010 annual report of the American Association of PCC (0.027%) amounting to 17 cases while it was much higher in Mexico; 1000 deaths from scorpion stings occurring per year (Bush and Charles, 2003).

The recorded mortality rate in our series was considered comparatively low 0.3% (Table 9). Shadnia, 2007 found that mortality rate in Tehran 2003 was 1.3% in the study conducted in the Islamic Republic of Iran. Another report from Saudi Arabia, 1999–2003 revealed a mortality rate of 2.2% (Moazzam et al., 2004). In contrast, the 2010 annual report of the American Association of PCCs revealed that out of 2,384,825 cases, they had 1730 deaths (0.07%) (Alvin et al., 2011). However, this report included non-attending, trivial therapeutic accidents and information-seeking cases reported through telephone calls and not only symptomizing referred poisoning cases, making the comparison unacceptable. The large percentage of organophosphate poisoning, the relatively high severity and necessity for ICU treatment, the relatively high frequency of mechanical ventilation and the large number of fatalities (Table 10) make the organophosphate problem of particular importance to the health care system, and invite for more rigid regulations concerning its misuse.

Decontamination procedures and activated charcoal were the most frequent procedures undertaken for poisoning cases. Antidotes followed in frequency of use. The most frequently used antidote was atropine and obidoxime reflecting the large number of received organophosphate poisoning cases. Mechanical ventilation was a common tool in ICU admitted serious cases 30% of which were due to organophosphorous poisoning and 16% due to tramadol overdose reflecting the severity grade of these types of poisoning (Table 12). The cost of management of organophosphate and tramadol, as evident from the above figures, are evaluated as great and incapacitating resources and budget of health care service for these specific intoxications.

Compared to total number of patients in PCC on 2005 (Gamalludin et al., 2006), a substantial decrease of the total annual number was evident on 2011, essentially due to the curfew regulations imposed by the armed forces for several months on different occasions after the 2011, January revolution. A significant decrease of organophosphate intoxications from 17 % on 2005 to 9.8% on 2011 reflects the efforts triggered by PCC Ain Shams University, Media and Ministry Of Health to restrict the widespread use of these chemicals. On the other hand a significant rise of

drug overdose was noted mainly due to the progressive dissemination of tramadol.

Another impressive finding is the methanol poisoning decreased mortality rate by about 75% due to the state's tighter control against alcoholic beverages adulteration.

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الملخص العربي

التقرير السنوي لعام 2011 لمركز علاج التسمم

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الخلفية: التسمم هو مصدر قلق متزايد للعامّة وتهديد محتمل للمجتمع المصري. مركز علاج التسمم بمستشفيات جامعة عين شمس، هو أول وأكبر مركز في مصر والشرق الأوسط وقد استقبل و عالج أكثر من 21000 مريض في عام 2011 والهدف من هذه الدراسة هو تسليط الضوء على ملف التسمم في مصر لتسهيل التعرف على التهديدات المختلفة التي يتعرض لها المجتمع المصري.

الطرق: البيانات المحوسبة لبرنامج مصمم خصيصا يحتوي على الديموغرافية، بالإضافة إلى البيانات السريرية وعلاج حالات التسمم الواردة في مركز علاج التسمم عام 2011. ويتم إنجاز تحليل وصفي وإحصائي من السجلات الطبية. النتائج: عموماً، تم تسجيل 21550 حالة تسمم. وتمثل الأطفال دون سن 7 سنوات في 23.9% من الحالات، والمرضى في سن 15-40 سنة 62.8% من الحالات. في 49% من المرضى، كان التسمم متعمداً. كان بالتأكيد محاولة الانتحار أكثر شيوعاً في الإناث والتي في وقت مبكر من عمر البلوغ. وكانت المواد التي يأتي ذكرها كثيراً كمسبب للتسمم هي التسمم الغذائي، ومركبات الفوسفات العضوية، ومنتجات التنظيف و الترامادول الذي تضاعف تقريباً سنوياً على مدى السنوات القليلة الماضية. وكان الشدة السريرية بسيطة في 75.1% من الحالات، و 20.7% متوسط الشدة و 4.2% كانت شديدة. وسجلت واحد وستين حالة وفاة. علاج هذه الحالات تم وصفه **الاستنتاجات:** يتم وضع اهتمام خاص نحو محاولة الانتحار لدى المراهقين، و السن الصغير من متعاطي المخدرات والزيادة التدريجية لتعاطي المخدرات وتغير نمط التسمم خلال السنين.

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