AJPS, 2017, Vol. 17, No.1 **Date of acceptance:6-12-2016**

Patterns of Poisoning Cases Reported in the Baghdad Poisoning Control Center during 2014

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Abstract:

Poisoning is an important clinical emergency and represents a major contributor to morbidity and mortality worldwide. However, early diagnosis and management of poisoning significantly affect mortality and morbidity as well as health care costs. Understanding the characteristic of poisoning cases is important for treatment. The present study investigated the characteristic of poisoning cases in Baghdad Poisoning Control Center (PCC). Data on all poisoning cases reported in Baghdad PCC during 2014 were retrospectively obtained from the medical records. A total of 804 reports of poisoning caseswere analyzed according to geographical distribution, age of victims, gender, the type and class of poisoning agent, and the follow up after poisoning. The results of this study showed thenecessity to continue collecting data of patients admitted to emergency departments and poisoning control centers andaddress the main obstacles facing the management of poisoning cases and decrease morbidity and mortality.

Key words: Baghdad PCC, Poisoning cases, Toxicity reports

دراسة حالات التسمم المسجلة في مركز استعلامات السموم في بغداد خلال عام 2014

الخلاصة:

تعتبر حالات التسمم من دواعي الطوارئ المهمة وتمثل عامل رئيسي لحالات المرض والوفاة في العالم. التشخيص والعلاج المبكر لحالات التسمم يؤثر إيجابا على عدد الوفيات والكلف المترتبة على علاج حالات التسمم. ان فهم خصائص حالات التسمم مهم لغرض استخدام العلاج المناسب للحالة. تم دراسة خصائص الحالات المسجلة في مركز استعلامات السموم في بغداد. حيث جمعت بيانات حالات التسمم المسجلة بأثر رجعي في عام 2014 من خلال استخدام البيانات الطبية لكل مريض. تم تحليل 804 حالة اعتمادا على الموقع الجغرافي وعمر الضحيةوالجنس ونوع المادة المسببة وكذلك متابعة المريض بعد تلقي العلاج. أظهرت نتائج هذه الدراسة ضرورة جمع البيانات الخاصة بحالات التسمم وتحليلها بصورة مستمرة بالإضافة المعرفة المعوقات الرئيسية التي تواجه عملية العلاج وتقليل حالات التدهور المرضي والوفاة.

Introduction:

Poisoning is a qualitative term used to define the potential of a chemical substance to adversely or deleteriously affecting the body. It is one of the leading causes of admission to emergency services in many countries [1,2]. Many reports from several Middle Eastern countries, like Saudi Arabia, Bahrain, Oman, Iran, Palestine and Turkey, showed that acute poisoning in adolescents and adults is an important clinical emergency and represent a major contributor to morbidity and mortality in these areas [3]. However, early diagnosis and management of poisoning significantly affect mortality and morbidity as well as health care costs [2].All poisoning cases were attributed eitherto intentional use of drugs and chemicalsor accidental exposureto chemicals especially in children [4]. According to World Health Organization (WHO), about 364,000 people died worldwide in 2004 due to un-intentional poisoning, 91% of all cases were reported in low and middle income countries[5]. Furthermore, 700 persons die daily around the world in addition to another thousands affected by poisoning. More than three millions of poisoning cases were reported annually; with about 250000 deaths occur worldwide, 99% of these cases were registered in developing countries [6]. Additionally, the annual incidence of both accidental and deliberate human poisoning in developing countries

varies between 0.2 and 9.3 poison exposures per 1000 persons of population and continuous to increase annually worldwide [7,8].Advances in technology and social development have resulted in the availability of vast number of chemical substances in community; poisoning resulted from such materials might be frequently reported due to extensive use in medicine, agriculture, industry, and residential environment [9]. In Iraq, some studies reported poisoning cases in different areas, for instance; unintentional poisoning occurred in Iraq in early 1972 by ingestion of grain treated with methyl mercury fungicide, when this toxic grain consumed as food by Iraqi resident in rural areas, the recorded death toll was 650 people [10]. More than a hundred poisoning cases from Kerosene were reported among Iraqi children during a period of two years [11]. Thallium poisoning from contaminated cake have been reported in two families in 2008, however, the availability of the proper treatment was a question [12]. Some other studies reported poisoning outbreaks in Iraq; nevertheless, inadequate analysis of quality and incidence of poisoning cases in Iraq is still important. The amount and route of exposure, and the type of poison are varied from one area to another in Iraq. This dependson the socioeconomic factors, cultural diversity and availability of particular toxin. Already, previously evaluated the incidence and nature of poisoning cases reported in Baghdad area, Iraqduring 2013[13]. The present study was designed to evaluate the poisoning cases reported in Baghdad, Iraq during 2014. Some parameters like type of toxin, age and sex of patients involved, area of poisoning, and case prognosis are discussed in this study.

Materials and Methods:

The reports of poisoning cases registered by the medical referral system (written, request, direct contact, samples and calls) to the Baghdad Poisoning Consultation Center (PCC) were analyzed during a period of one year (January to December 2014). The reports obtained from the PCC (appendix 1) included patients name, age, address, gender, admission date and time, location, poison's nature and quantity (if applicable), chief complaint, symptom and treatment given. The total number of cases reported in Baghdad PCCwere 804 during 2014. The age, sex, geographical distribution, and causes of poisoning according type and class of poisoning agent, and number of cases followed by physician were evaluated, and then compared with the cases reported in 2013 in the same area.

Results and Discussion:

A total of 804 reports of poisoning cases were reported in Baghdad city area. Geographical distribution of the analyzed cases showed that 76.86% of poisoning cases (618 cases) were from urbane area, while 32.14% (186 cases) were reported in suburban area (Table 1).The gender and time of the reported cases wereevaluated (table 2). More than half of the analyzed cases were males (n=440, 54.72%) compared to females (n=364, 45.28%), with male to female ratio of 1.21. The majority of poisoning cases occurred in the summer period, admissions in June,August,and September were the most frequent (n=93, 81.78).Thedistribution of poisoning cases according to age was also evaluated. The highest number of poisoning cases were reported with the age group (11-20 years) (n=244, 27.86%)(Table 3).Metals were the most common cause of poisoning (n=695, 86.442% of total cases), followed by drugs (n=40; 4.97% of total

Table-1:Geographical distribution of poisoning cases reported in Baghdad PCC during 2014

Percent	Number of cases	Area
76.86	618	Urban
23.14	186	Sub urban
100	804	Total

Table-2:Distributionof poisoning cases according to gender and time of referring in Baghdad PCC during 2014

Total	Female No.(%)	Male No.(%)	Month
44	21 (47.72)	23 (52.27)	January
64	29 (45.32)	35 (54.68)	February
71	36 (50.71)	35 (49.29)	March
56	24 (42.86)	32 (57.14)	April
46	26 (56.53)	20 (43.47)	May
93	41 (44.09)	52 (55.91)	June
51	25 (49.02)	26 (50.98)	July
81	40 (49.39)	41 (50.61)	August
78	35 (44.88)	43 (55.12)	September
53	18 (33.96)	35 (66.04)	October
80	35 (43.75)	45 (56.25)	November
87	34 (39.09)	53 (60.91)	December
804	364 (45.28)	440(54.72)	Total

cases), pesticide (*n*=33; 4.1% of total cases), unidentified materials (*n*=32, 3.98% of total cases), and rodenticides (*n*=4;0.497% of total cases) (Table 4).

Table-3: The distribution of poisoning cases reported in Baghdad PCC in 2014 according to age groups.

Number of cases (%)	Age (years)
12 (1.49)	1 day -1 year
123 (15.29)	1 -10
224 (27.86)	11-20
182 (22.6)	21-30
102 (12.68)	31-40
61 (7.58)	41-50
100 (12.44)	51 and above
804 (100)	Total

Table-4: The causes of poisoning cases reported in Baghdad PCC during 2014

Number of cases (%)	Poisoning agent
695 (86.44)	Metals
33 (4.1)	Pesticide
40 (4.97)	Drugs
32 (3.98)	Unknown
4 (0.49)	Rodenticide
804 (100)	Total

Regarding the type metals, Copper was found to be the causative agent behind 75.99% of reported poisoning cases (Table 5). While the other types of metals were Mg (*n*=36; 4.47%), Lead (*n*=16; 1.99%), Zinc (*n*=10; 1.24%), Copper plus zinc combination (*n*=10; 1.24%), copper plus lead combination (*n*=6; 0.75%), lead plus zinc (*n*=2, 0.24%), and unidentified metals (*n*=3; 0.37%).Table6 showed the types of pesticidesand rodenticides that involvedin the reported poisoning cases. Zincphosphidewasfound to be themajor causative agent (*n*=12; 36.36% of total casesattributed pesticides). The other compounds wereorganophosphorous type (*n*=7; 21.2%), Zinc phosphide plus warfarin (*n*=6; 18.18%), Unknown insecticides (*n*=3; 9.09%), while (insecticide plus rodenticide), organochloride and warfarin were alloccurred in equal percent(*n*=1; 3.03%).Analyses of poisoning cases that caused by drugs were also done. Unidentified types of drugs wereresponsible for 36.36% of all poisoning cases attributed to ingestion of drugs; others are shown in table 7. Our results revealed that 246 cases were received follow up by the health care professionals (*n*=246; 30.59% of total cases reported), while the number of cases

that donot received follow up were 558 (69.4%). Table 8 showed thedistribution of poisoning cases that received or not received follow up from urban and suburban areas.

Table-5: The types of metals that caused in poisoning cases reported in Baghdad PCC during 2014

No. of cases (%)	Metal type
611 (75.99)	Copper
36 (4.47)	Mg
10 (1.24)	Zinc
16 (1.99)	Lead
3 (0.37)	Unidentified
10 (1.24)	Copper + Zinc
1 (0.12)	Mg + Copper
6 (0.75)	Copper + Lead
2 (0.24)	Lead + Zinc
695 (86.44)	Total

Table-6: The types of pesticides and rodenticides that involved in poisoning cases reported in Baghdad PCC during 2014

No. of cases caused by pesticide (%)	Pesticide type
12 (36.36)	Zinc phosphide
2 (6.06)	Organochloride +Organophosphrous
1 (3.03)	Warfarin
7 (21.21)	Organophosphorous
1(3.03)	Insecticide + Rodenticide
3 (9.09)	Unidentified insecticide
6 (18.18)	Zinc phosphide + Warfarin
1 (3.03)	Organochloride
33 (100)	Total

Table-7:Thetypes of drugs that involved in the poisoning cases reported in Baghdad PCC during 2014

No. of cases caused by drugs (%)	Type of drug
12 (36.36)	Unknown drugs
4 (9.09)	Paracetamol
4 (9.09)	Carbamazepine
3 (6.81)	Tramadol
3 (6.81)	Chlorpromazine
2 (5)	Tramadol +Paracetamol
2 (5)	Tramadol +Diclofenac
2 (5)	Lithium
1 (2.27)	Hyoscine+ Clomipramine
1 (2.27)	Carbamazepine+Loratidine +Cinnarizine
1 (2.27)	Nitrazepam
1 (2.27)	Diazepam
1 (2.27)	Opioid
1 (2.27)	Procyclidine
1 (2.27)	Orphenadrine
1 (2.27)	alprazolam
40 (100)	Total

Etiologic and demographic characteristics of acute poisoning reported in Baghdad PCC during 2014 were evaluated in this study. Poisoning is an important public health problem and its mortality is predominantly a problem worldwide[4]. The rate of poisoning related ED visits ranges from 0.076 to 0.7 % of emergency departments the visits annually [8,14]; in western countries, the annual rate of poisoning related ED visits reached about 0.26 % [14,15]. These could explain the impact of poisonings on human health. Social class of the referred cases to Baghdad PCC were mostly from urban regions, this might explain the small contribution of pesticides in the reported cases.

Table 8: Distribution of poisoning cases reported in Baghdad PCC during 2014 according to their follow up.

Suburban No. (%)	Urban No. (%)	
67 (36.02)	179 (28.96)	Followed
119 (63.98)	439 (71.09)	Not followed
186	618	Total

These results are tune with a previous study performed in Iraq[13]. Development of wide range of drugs, chemicals, household products and modern life style made poisoning cases from suburban less. On the other hand, previous studies conducted in other parts of the world like Iran [9,16], Turkey [17,18] and Japan [19]indicated that the majority of poisoned patients were young adults less than 25 year. In the present study, similar results were obtained, and the number of poisoning cases decreased with increasing age, compared to what is reported in some other parts of the world such as Spain [20,21], Germany [22], USA [23] , and Norway [24],where the mean age of patients were above 30 years. It has been reported that 13% of young poison victims had visited mental health facilities in the preceding week of poisoning incidence and 18% in the previous months[5], indicating that the prevalence of poisoning in teenagers and young people because of psychiatric or social problems; however, other causes may be possible. The present study revealed that poisoning cases were more common in males than females, which is similar to what reported previously in Iraq [13]. An increasing trend of poisoning mode in males compared to females was noticed, contrary to a higher female/male ratio in intentional poisoning as reported in other studies [25,26]. Low socioeconomic status, rapid urbanization, unemployment and other frustrations could probably be contributing factors for high poisoning and probably suicide rates among men [26,27]. These factors may be applicable in Iraq. Furthermore, the majority of intoxication cases were admitted during spring and summer, which is in agreement with previous studies conducted in Iraq [13] and other countries [15,19,28,29]. Globally, poisoning of adolescent constituted the majority of these cases, this is possibly due to the mood fluctuations that have seen during the spring and summer months. Some issues that may occur when student are on holiday such as graduation, bad school reports, hormonal changes are also associated with increased rate of depression among young people. Regarding medication related poisoning cases, the proportion of poisoning cases due to the prescribed drugs tended to increase over time. Pharmacies were the most common source of toxic materials. However, compared to reports from Europe [14,30,31], USA [24], and Asia [29,32] that presented the medicinal agent as the main toxic agents, the findings of the present study were not in tune with these studies. The drugs related cases were not the primary cause; yet, the unknown drug causes were common. The major etiologic factors for intoxication were metals (86.44 % of total cases reported). Copper represented 87.91 % of cases caused by metals; this result is similar to previous report in Iraq 2013 [13]. This may be due to the use of copper water pipes. Other sources of Copper are IUDs (intra uterine devices), oral contraceptive with their estrogen content. Several studies have reported that pesticides were the most

commonly used agents of poisoning in many regions worldwide, however, findings from the present study showed that pesticides contributed only for 4.10% of all poisoning cases evaluated in Baghdad area. This finding was in tune with that reported previously in Baghdad (7.1% of poisoning cases) [13]. Additionally, there was 3.98% of poisoning cases attributed to unknown xenobiotics; therefore, more efforts by health care providers are required to detect the cause of poisoning and use the appropriate treatment leading to decrease the risk of morbidity and mortality to patients. Other important finding provided by the present study is the poisoning cases follow up, which is crucial to prevent any complication that may arise later. Only 30.59% of cases were received follow up, so more attention may be required to prevent the possible negative outcomes and reduce mortality and morbidity. Many cases reported in some countries such as turkey [17,18] were due to consumption of toxic substance for committing suicide. However, thepresent study do not provide clear information about the nature of poisoning whether it was suicidal or not, this is due to lack of such information in the data base of Baghdad PCC.

Conclusion:

Metals (mostly copper) and drugs (mostly unidentified type) represent the major causes of poisoning cases. To prevent such poisoning, additional community education explaining the danger of drugs, metals, and other toxins are recommended. Further, health care providers should execute more effort to properly diagnose and manage such cases. The results of this study suggested that is necessary to continue collecting data of patients admitted to emergency departments and poisoning control centers to discuss the main obstacles facing the management of poisonings and decrease morbidity and mortality.

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