

Acute Poisoning in Southern Iraq: A Retrospective Study from Al-Nasiriyah

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Abstract

One of the most critical reasons for many medical emergencies in Iraq is acute poisoning. The research, herein, focussed on better evaluating the epidemiological properties, poisonous materials as well as results of acute poisoning by targeting mainly on 1006 patients from area as Al-Nasiriyah, southern Iraq from years Jan 2013 to Dec 2020. The patients discussed in this paper were mainly from two main hospitals as Al-Hussein and Bint Al-Huda Teaching Hospitals. Different parameters as background of patients, their medical history, results of labs, age of the patients, duration of the admittance to hospitals and the medical care they received at hospitals were checked carefully. The results obtained in this study were analyzed by different Chi-square tests. It was revealed that patients having ages near about 12, showed greater ratio of the poisoning which was less in 20 years patients. Nearly 541 cases (53.8%) were the patients with age 12 years, 255 cases (25.3%) were of patients having ages more than 20 years while 210 cases (20.9%) were reported for patients who have ages in between 13 to 20 years. When the comparison was made between patients based on gender, it was observed that 59.2% and 40.8% of males and females were affected by poisoning correspondingly. Furthermore, results of the study highlight that reason of the poisoning varied as accidental (66.7%) and planned poisoning (24%). Nearly 610 number of cases were mainly associated with drugs while 337, 127 and 124 cases were due to exposure to pesticide, organophosphorus compounds and zinc/aluminum phosphide correspondingly. Overall, the study revealed that in children of southern Iraq, the most common health challenge is acute poisoning.

Keywords: Acute Poisoning, Epidemiology, Toxicity by Drugs, Poisoning, Poison Control Center

Introduction

Poison Control Centers (PCCs) play an important role in the management of acute poisoning cases. The primary functions of PCCs include providing 24-hour toxicological consultation to healthcare professionals and the public, coordinating patient care between primary healthcare facilities and specialized treatment centers. The Thi-Qar Poison Control Center receives reports from multiple hospitals in the governorate and provides guidance on diagnosis, initial stabilization, decontamination procedures, specific antidote administration, and supportive care measures ^(21, 22). Acute poisoning is defined as the harmful effect that occurs when a toxic substance enters the body through ingestion, inhalation, injection, or dermal absorption, resulting in cellular damage and organ dysfunction that poses serious threats to life ⁽¹⁻⁴⁾. Clinical symptoms of poisoning depend on the poisonous agent, dose, route, and time since exposure ⁽⁵⁻¹⁰⁾. Acute poisoning represents a major global health burden and is one of the leading causes of

emergency department admissions worldwide ⁽¹¹⁻¹⁶⁾. According to the World Health Organization (WHO), poisoning causes approximately one million diseases and significant morbidity and mortality, especially in low- and middle-income countries. Pharmaceuticals, household chemicals, agricultural pesticides, and natural toxins induce acute poisoning. Pharmaceutical medications are common poisoning causes, especially in children. Analgesics, especially paracetamol, are often blamed because they are widely available as over-the-counter drugs and stored improperly in many families. If N-acetylcysteine is not administered immediately, paracetamol overdose might cause liver failure. Carbamazepine with valproic acid poisoning can produce tiredness, ataxia, and cardiovascular problems. Due to their limited therapeutic index, tricyclic antidepressants and antipsychotics can produce cardiac arrhythmias and CNS depression ⁽¹⁷⁾. The circumstances of poisoning vary greatly by age. Colourful pharmaceuticals, attractive household chemicals,

and incorrectly stored dangerous substances are common causes of accidental or unintentional poisoning in young toddlers, who are naturally curious and investigate their environment orally. Youth and young adults are more likely to intentionally self-poison, frequently due to psychological anguish, depression, or suicidal ideation. Third, substance misuse poisoning covers recreational drug abuse and therapeutic mistakes⁽¹⁸⁾. In southern Iraq, including Thi-Qar, acute poisoning is a major public health issue. The agricultural nature of the region with widespread pesticide use, inadequate regulations on the sale and storage of toxic chemicals, low poison prevention awareness, and limited access to specialised toxicological services all contribute to this burden. Agriculture uses organophosphate chemicals and zinc/aluminum phosphide rodenticides, which are poisonous and deadly^(19, 20). The treatment of acute poisoning involves stabilizing vital functions and airway protection, gastric decontamination. Pharmaceutical poisonings are widespread in developed countries and have antidotes. Due to their toxicity and limited treatment options, organophosphates and metal phosphides are associated with increased case fatality rates in developing countries like Iraq^(23, 24). This study evaluated the epidemiological characteristics, widely implicated toxic substances, and clinical outcomes of 1006 patients from area as Al-Nasiriyah, southern Iraq from years Jan 2013 to Dec 2020.

Materials and Methods

This study employed a retrospective design. All data were extracted from archived hospital emergency records and poisoning case sheets submitted to the Thi-Qar Poison Control Center (PCC) in Al-Nasiriyah. The study covered an eight-year period from January 2013 to December 2020. Cases are initially reported via phone calls, followed by subsequent management. A total of 1,006 poisoning cases studied. The patients discussed in this paper were mainly from two main hospitals as Al-Hussein and Bint Al-Huda Teaching Hospitals. Different parameters as background of patients, their medical history, results of labs, age of the patients, duration of the admittance to hospitals and the medical care they received at hospitals were checked carefully. In cases of organophosphate poisoning, serum cholinesterase levels measured.

Statistical analysis

Data was analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA)⁽²⁹⁾. Descriptive statistics used to summarize variables as frequencies and percentages. Chi-square (χ^2) test applied to assess significant variations between variables as age, sex, exposure types, and patient findings.

Results

Nearly 1006 cases recorded from 8 years. Findings of the study highlight that there are male patients who get more affected in comparison with female patients as 59.2% cases were of males while only 40.8% cases were of females (Table 1).

Table 1. Patients' toxicity according to gender.

Sex	Frequency	Percent
Male	596	59.2
Female	410	40.8
Total	1006	100

A chi-square test showed a statistically significant difference in poisoning frequency between males and females ($p < 0.05$). According to age group, poisoning in children aged 0-12 years was the most frequent, accounting for approximately 541 cases (53.8%), as shown in Table 2.

Table 2. Poisoning cases according to age group.

Age group (Year)	Frequency	Percent
0-12	541	53.8
13-20	210	20.9
Above 20	255	25.3
Total	1006	100

Age distribution showed statistically significant variation (chi-square, $p < 0.05$), indicating that children aged ≤ 12 years were disproportionately affected.

Accidental exposure to toxic substances including pharmaceuticals (acetaminophen, carbamazepine, tricyclic antidepressants, valproic acid, iron supplements, and antipsychotics), pesticides (organophosphates, zinc/aluminum phosphide, pyrethroids, and superwarfarins), and herbal toxins (*Datura stramonium* and *Amanita mushrooms*) was the most common type of exposure, accounting for 671 cases (66.7%), followed by suicidal exposure with 241 cases (24.0%), as illustrated in Table 3.

Table 3. Poisoning cases according to the type of exposure

Type of exposure	Frequency	Percent
Accidental	671	66.7
Suicide	241	24
Misuse	94	9.3
Total	1006	100

Most patients (930, 92.4%) were admitted to the hospital within 24 hours of exposure, while only 40 (3.9%) were admitted after 24 hours, as shown in Table 4.

Table 4. Poisoning cases according to the time of admission after poisoning.

Time of admission post exposure	Frequency	Percent
Within 24 hrs.	930	92.4
After 24 hrs.	40	3.9
Unknown time of exposure	36	3.7
Total	1006	100

The majority of patients (962, 95.6%) had a favorable prognosis after treatment, while only 20 (2%) had a poor prognosis, as shown in Table 5.

Table 5. Prognosis of poisoning cases.

Patient Prognosis	Frequency	Percent
Good prognosis	962	95.6
Bad prognosis	20	2
Unknown prognosis	24	2.4
Total	1006	100

Exposure type was associated with prognosis ($p < 0.05$). Suicidal poisoning cases showed higher likelihood of poor outcomes in comparison with accidental exposures. Among the 610 patients with drug toxicity, acetaminophen was the most frequent culprit, affecting 268 individuals (43.9%), as shown in Table 6 and Figure 1.

Table 6. Poisoning cases according to the type of drug.

Drug type	Frequency	Percent
Acetaminophen	268	43.9
Carbamazepine	171	28
Tricyclic antidepressant	77	12.6
Valproic acid	17	2.8
Iron	27	4.4
Antipsychotic	50	8.2
Total	610	100

Both organophosphates and zinc phosphide were the most commonly encountered pesticides based on toxicity type, with 127 cases (37.7%) and 124 cases (36.8%) respectively, as illustrated in Table 7 and Figure 2.

Table 7. Poisoning cases according to the type of pesticide.

Type of pesticide	Frequency	Percent
Organophosphates	127	37.7
Zinc / Aluminum phosphide	124	36.8
Pyrethroids	41	12.2
Superwarfarins	45	13.4
Total	337	100

Poisoning incidents involving toxic herbal substances such as Amanita mushrooms and Datura stramonium were also reported, as detailed in Table 8.

Table 8. Poisoning cases according to the type of herbal toxin.

Herbal type	Frequency	Percent
Datura stramonium	27	50.9
Amanita mushroom	26	49.1
Total	53	100

Discussion

The present study provides a comprehensive epidemiological profile of acute poisoning cases in Al-Nasiriyah over an eight-year period, revealing important patterns that can guide public health interventions in southern Iraq.

The observed male predominance in poisoning cases is consistent with the findings reported by Pokhrel et al. (2008)⁽²⁵⁾, who found that unmarried males had higher poisoning rates (34%), while married females were more frequently affected (57%)⁽²⁶⁾. However, this contrasts with the study by Getie and Belayneh (2020)⁽¹⁷⁾, which reported a female predominance (55% vs. 45%). The higher male incidence in the current study may reflect the greater occupational exposure of males to agricultural pesticides and hazardous chemicals in the predominantly agricultural Thi-Qar region.

The disproportionately high rate of poisoning among children aged 0–12 years is a finding of particular concern. Children in this age group are developmentally inclined to explore their surroundings orally, which makes them especially vulnerable to accidental ingestion of improperly stored pharmaceuticals and household chemicals. Similar findings were reported in studies from Basra and Baghdad^(11,12), as well as by Özköse and Ayoğlu (1999)⁽²⁷⁾, who observed higher toxicity rates in younger patients. In contrast, Pokhrel et al. (2008)⁽²⁵⁾ reported the highest poisoning rates in the 15–24 year age group (39.1%), and Getie and Belayneh (2020)⁽¹⁷⁾ found the highest rates among patients aged 21–30 years, suggesting regional variations in age-related risk profiles.

The predominance of accidental exposure over intentional self-poisoning reflects the high vulnerability of young children in this cohort^(13,18). Acetaminophen was the most commonly implicated pharmaceutical agent, likely due to its widespread availability as an over-the-counter medication and improper storage in households without child-resistant packaging⁽¹⁷⁾. The involvement of tricyclic antidepressants, valproic acid, iron supplements, and antipsychotics further underscores the need for

strict pharmaceutical dispensing practices and enhanced medication safety awareness programs.

Among pesticide-related cases, organophosphates and zinc/aluminum phosphide were the most frequently implicated agents, consistent with Pokhrel et al. (2008)⁽²⁵⁾ who reported 66.7% organophosphate and 19% zinc phosphide toxicity, and Getie and Belayneh (2020)⁽¹⁷⁾ who found 45% organophosphate toxicity. Phosphide poisoning was associated with higher fatality rates in our study⁽²⁸⁾, reflecting the limited treatment options available for these highly toxic agents.

Herbal toxicity cases involved *Datura stramonium* (50.9%) and *Amanita mushrooms* (49.1%), both of which can produce severe anticholinergic or hepatotoxic effects. The favorable overall prognosis (95.6%) reflects the effectiveness of timely medical intervention, with the majority of patients presenting within 24 hours of exposure (92.4%).

The main limitations of this study include its retrospective design, reliance on hospital records which may contain incomplete data, and the absence of detailed information on specific treatment protocols and long-term patient follow-up.

Conclusion

The findings of this retrospective project highlight that main affected group of Al-Nasiriyah, southern Iraq from poisoning is children having age from 0 years to 12 years. In relation to gender of patients, nearly 59.2% of males are affected in comparison with females. The most common reason for the results obtained was the unintentional exposure of patients to poisoning that resulted in 66.7% of cases studied in this project. Other reasons for the poisoning include exposure to acetaminophen drug and organophosphorus compounds that resulted in 43.9% and 37.7% reported cases correspondingly. Furthermore, studies showed that planned poisoning may also affect the overall cases studied however, that is mainly due to poorer consequences.

The findings of the study need to be assessed more by taking cases from different other centers and patients having different ages, living areas or level of poisoning.

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Conflicts of Interest

Not applicable.

Funding

None.

Ethics Statements

Not applicable.

Author Contribution

Study conception and design: A.H. Alzaidy; data collection: Ali THK Alasady; analysis and interpretation of results: A.H. Alzaidy, Ali THK Alasady, Ruqayah KJ. Alwahhah; manuscript writing: A.H. Alzaidy, Ruqayah KJ. Alwahhah. All authors reviewed the results and approved final version.

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التسمم الحاد في جنوب العراق: دراسة شاملة في مدينة الناصرية أسعد حسن الزيدي^{1*}، علي ثجيل خليف الاسدي² و رقية كريم جبار الوحاح³

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الخلاصة

يُعدّ التسمم الحاد من الأسباب الرئيسية لحالات الدخول الطارئ إلى المستشفيات على مستوى العالم، ولا يزال يُشكّل قضية صحية عامة حرجية في العراق. تم تقييم العوامل الوبائية والمواد السامة ونتائج حالات التسمم الحاد في مدينة الناصرية جنوب العراق. استعرضت الدراسة بأثر رجعي 1,006 حالة تسمم مُسجلة في مركز مكافحة السموم في ذي قار خلال الفترة من 2013 إلى 2020. تم تأكيد الحالات في مستشفى الحسين ومستشفى بنت الهدى التعليميين استناداً إلى التاريخ المرضي للمريض والفحص السريري والنتائج المختبرية. جُمعت معلومات عن الخصائص الديموغرافية للمرضى (العمر، الجنس، محل الإقامة)، ونوع المادة الخطرة، وطريقة التعرض (عرضي، مُتعمد، أو بطريقة أخرى)، ووقت الإدخال وموسمه، والمظاهر السريرية، ومآلات العلاج. استُخدمت اختبارات مربع كاي لمقارنة العمر وأنماط التعرض والنتائج السريرية، فيما وصفت الإحصاءات الوصفية توزيع الحالات. سجّل الأطفال بعمر 12 سنة فما دون أعلى معدل تسمم (53.8%)، تلاهم البالغون (25.3%) ثم المراهقون (20.9%). وبلغت نسبة الذكور المتأثرين 59.2% مقابل 40.8% للإناث. كان التعرض العرضي هو الأكثر شيوعاً (66.7%)، يليه التسمم الذاتي المُتعمد (24%). ارتبطت غالبية حالات التعرض للمبيدات بمركبات الفوسفور العضوية (37.7%) وفوسفيد الزنك (36.8%). تُشير هذه الأرقام إلى أنّ التسمم الحاد يُمثّل مشكلة صحية عامة كبيرة في جنوب العراق. يمكن تفاديها، لا سيّما بين الأطفال والمراهقين. ولتحقيق ذلك، ينبغي تحسين سبل الوقاية من التسمم، وتعزيز سلامة المواد الكيميائية المنزلية، وتطوير خدمات مراكز مكافحة السموم.

الكلمات المفتاحية: التسمم الحاد، علم الوبائيات، السمية الدوائية، التسمم، مركز السموم