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***Factors Contributing to Acute Poisoning in Adults:
A Retrospective Study of Acute Poisoning Cases and Their Management
at the Emergency Department of Al-Hussaini Teaching Hospital,
Karbala, Iraq***

***A Research Project
Submitted to Al-Zahrawi University College pharmacy department in Partial
Fulfillment of the Requirements for the Bachelor in Pharmacy***

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Abstract

Background: Poisoning is a major world health problem that leads to serious illness, death, and big problems for society and the economy. Acute poisoning, which means rapid harm after exposure, happens every day in emergencies caused by accidental or intentional exposure to toxic agents such as chemicals, pharmaceuticals, pesticides, and environmental toxins.

Objective: This work aimed to assess the pattern of acute poisoning in the Emergency Department of Al-Hussaini Teaching Hospital, Karbala, Iraq

Methods: A retrospective cross-sectional study of all registered poisoning cases managed at the emergency department of Al-Hussaini Teaching Hospital, Karbala, Iraq, was conducted from April 2024 to February 2025.

Results: Among 179 patients visiting the emergency department, (61%) of patients were males and (39%) were female. The most common poison used was benzodiazepines, which was consumed by (39%), tramadol by (33%) and TCAs by (21%) of patients.

Conclusion: Acute poisoning is more common in men, according to this study. The 61% intentional poisoning incidence highlights the need for mental health and socioeconomic help. Most victims are over 25, tying poisoning to poverty and chronic illness. Prescription drugs like benzodiazepines, tramadol, and TCAs are substantial toxicants in this study, unlike agricultural pesticides. Extreme cases require medical intervention, usually pharmacological treatment.

1. Introduction

Poisoning constitutes a significant global health concern, impacting numerous lives and leading to grave illness and mortality. Daily, individuals worldwide require care in emergency departments for accidental or deliberate poisoning. Failure to implement prompt and effective measures may result in catastrophic outcomes. Acute poisoning is characterized by the onset of detrimental consequences resulting from immediate exposure to a toxic agent, which may include chemicals, pharmaceuticals, biological agents, environmental and occupational toxins, or as a consequence of substance addiction. (1)

Poisoning has far-reaching detrimental effects on a society's health and economy. Consequently, to decrease poisoning occurrence and guarantee the execution of required actions to improve patient outcomes, such as prevention programs, it is essential to identify risk variables(2).

The incidence of poisoning cases is rising daily due to alterations in lifestyle and social conduct. Technological advancements and social progress have led to the widespread availability of numerous medications and chemical substances throughout the population(3).

Toxin levels vary by location. People in affluent nations are more likely to be poisoned by household chemicals and prescription medications. In less affluent countries, agricultural pesticides and other chemicals are a major cause, particularly self-poisoning. In most undeveloped nations, inadequate rules and poor health facilities make poisoning effects significantly more catastrophic(4).

Acute poisoning in adults is a significant public health risk that frequently arises as a consequence of a variety of circumstances that can result in severe health complications or even death. A comprehensive understanding of the factors that

contribute to acute poisoning is essential for developing efficient preventative strategies and enhancing patient outcomes.

This retrospective study aims to identify and analyze the elements contributing to adults' acute poisoning occurrences. The findings will provide significant insights into the demographics of these instances, the chemicals involved, and the conditions surrounding them.

Earlier studies (5) have highlighted the significance of awareness and education in reducing the dangers linked to poisoning. Examining these aspects enables medical practitioners to more effectively address the issues posed by acute poisoning and implement specifically targeted interventions.

2.Method

1.1 Study Design and Ethical Considerations

Adults admitted to Karbala, Iraq's Al-Hussaini Teaching Hospital, for acute poisoning cases are the subjects of this retrospective study. The topic's nature, specifically incidents of drug misuse and suicide attempts, necessitated obtaining the requisite legal authorization from the Karbala Health Directorate and the Training and Development Centre before data could be collected. In accordance with the standards of ethical research, we did not share any patient information and treated all data with the utmost confidentiality.

2.2 Data Collection

The hospital's Poison Control Centre and Emergency Department received 169 reports of acute poisoning between April 2024 and February 2025. Data were retrieved from the medical records of patients who presented to the emergency room with a diagnosis of acute drug poisoning. (Statistical software utilized) was used to record and tabulate the data in order to guarantee accurate statistical analysis.

The data collected encompassed the following: gender, age, poisonous substance type, clinical presentation, purposeful or accidental poisoning intent, diagnostic tests performed, and treatment methods.

2.3 Inclusion and Exclusion Criteria

2.3.1 Inclusion Criteria:

- ✓ Adults ≥ 18 years presenting with acute poisoning.
- ✓ Full medical records for cases with identification of toxic substances and treatment information.

2.3.2 Exclusion Criteria:

- ✓ Incomplete or absent medical records for cases.
- ✓ Pediatric cases of poisoning.
- ✓ Patients with chronic poisoning or chronic toxic exposure.

2.4 Study Location and Variables

The study was conducted at Al-Hussaini Teaching Hospital in Karbala, one of the main hospitals in the governorate. This hospital receives a high rate of emergency cases daily.

2.5 The following data were recorded:

2.5.1 Demographic Data: Age, gender.

2.5.2 Toxicological Data: Type of toxic substance (e.g., benzodiazepines, opioids, tricyclic antidepressants, amphetamines, etc.).

2.5.3 Clinical Presentation: Altered mental status, seizures, vomiting, tachycardia, respiratory distress, and nausea.

2.5.4 Poisoning Intent: The incidents were categorized as intentional (drug abuse, suicide attempt) or non-intentional (accidental exposure, therapeutic mistake).

2.5.5 Diagnostic Studies: Arterial blood gas (ABG), electrocardiogram (ECG), renal function tests (blood creatinine and blood urea), complete blood picture (CBP), serum electrolytes (potassium, chloride, sodium), and chest X-ray (CXR) in which brain CT scan is proper .

2.5.6 Management Strategies: Supportive care, administration of certain antidotes (e.g., flumazenil in benzodiazepine overdose, naloxone in opioid poisoning), symptomatic treatment (oxygen therapy, intravenous fluids, gastric lavage), and intensive care unit admission if necessary.

2.6 Statistical Analysis

Graphpad prism version 8.1 (Graphpad Software Inc., San Diego, USA) was used to analyze data and generate graphs.

Categorical variables (e.g., gender, intent to poison) were presented as frequency and percentage, while continuous variables (e.g., age) were presented as number and percent.

The chi-square test established the correlation of intention to poison with toxic materials, while logistic regression was utilized to ascertain predictors of significant association with intentional poisoning. Any p-value below 0.05 was considered to be statistically significant.

3. Results

3.1 Gender Distribution:

A higher percentage of males are impacted by acute toxicity incidents, as indicated by the chart (figure 1). **Male (61%) vs. Female (39%)"**

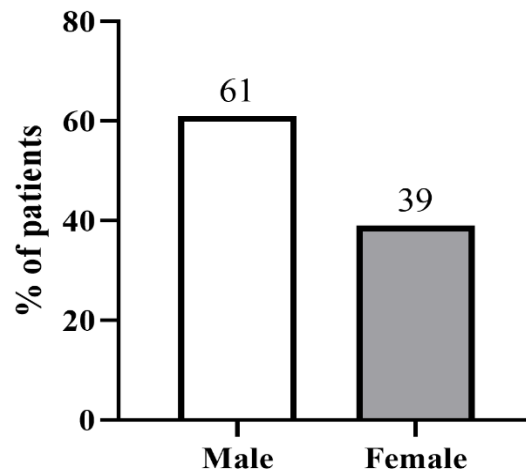


Figure 1: Gender Distribution

3.2 Age Group Participation Distribution

Count and Percentage by Category". Some age groups seem to have the highest incidence (over 25 years old) as shown in figure 2.

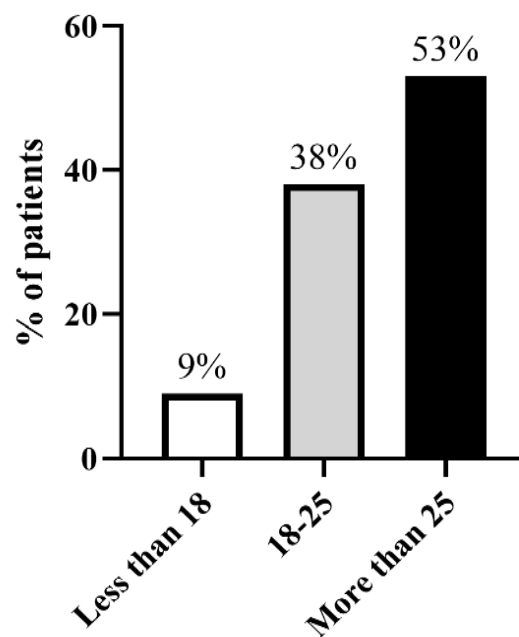


Figure 2: Age Group Participation Distribution

3.3 Type of toxicant

Benzodiazepines (39), **Tramadol** (33%), and **TCAs** (21%) show significant usage (figure 3).

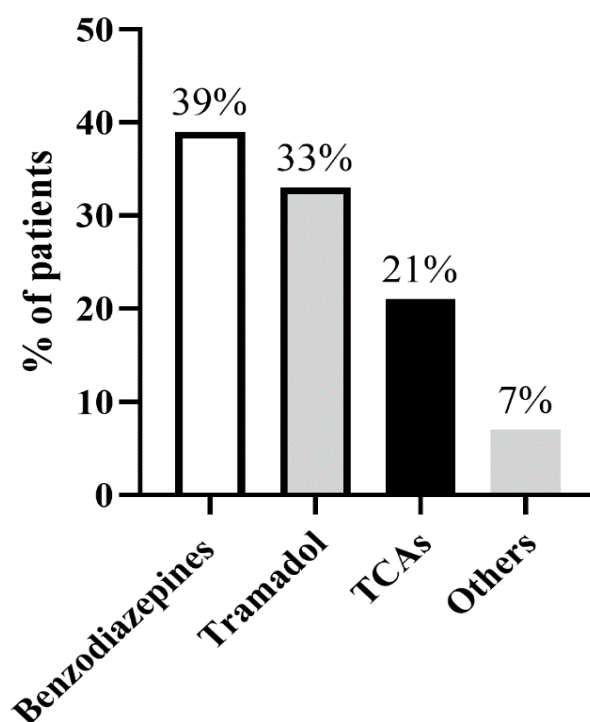


Figure 3: Distribution of Toxicant Types Among Patients

3.4 Intentional/unintentional

The majority of cases (61%) are **intentional**, suggesting a significant issue with self-harm or suicide attempts as shown in figure 4.

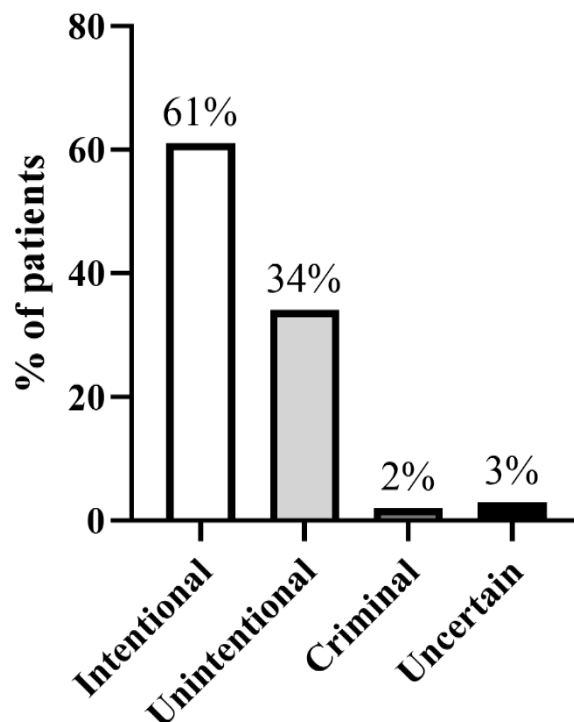


Figure 4: Distribution of Patient Incident Categories by Percentage

3.5. Severity

The data underscores the predominance of severe neurological (CNS) complications in this cohort, followed by cardiovascular (CVS) severe cases. Mild and moderate cases collectively represent nearly a third of the total, suggesting a significant burden of severe presentations (figure 5).

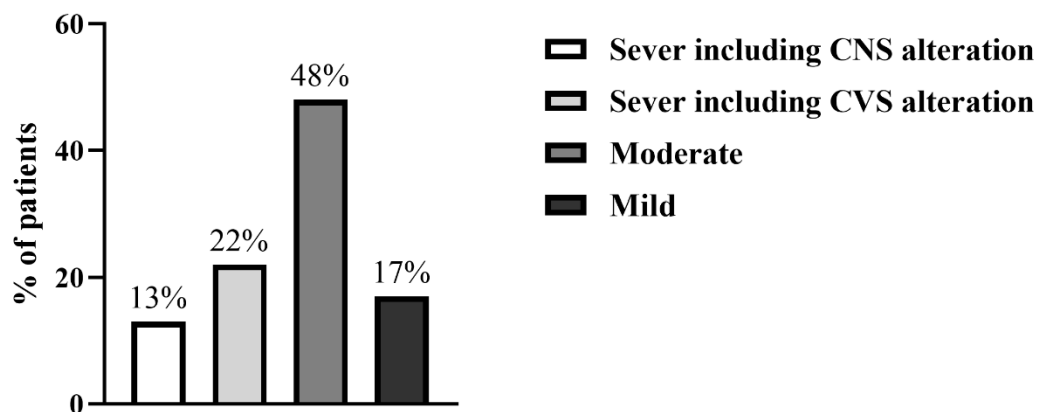


Figure 5: Severity of cases

3.6. Interventions

Drug treatment (50%): Highlighted as the primary intervention in half of all cases, making it the dominant approach (figure 6).

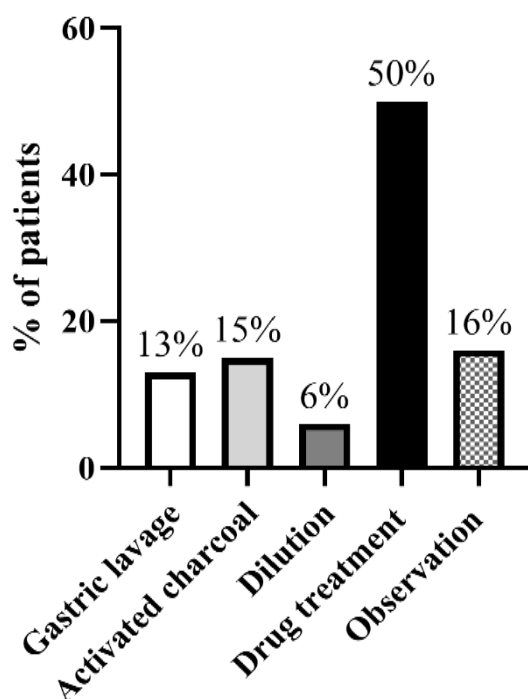


Figure 6: Toxicology Intervention Utilization Distribution

4. Discussion

4.1 Gender Disparity

The increased prevalence of acute toxicity in males is consistent with global trends, which indicate that males are more likely to engage in risky behaviors or experience occupational exposures. Nevertheless, the high prevalence of intentional cases (61%) implies a regional mental health crisis, which may be further exacerbated by socio-economic stressors or cultural norms that discourage males from seeking assistance. This study, in contrast with a study, was conducted at the emergency department of Dessie Referral Hospital, Ethiopia, shows a high prevalence of females (4)

4.2 Age group

The high number of cases that occur in people over the age of 25 may be a reflection of maturity stressors, such as economic instability or chronic health concerns, which increase the likelihood of persons engaging in self-harm through the use of easily accessible prescription medicines. This study is consistent with another study that revealed Majority of our patients (47.55%) were from 20-29 years age group followed by 30-39 years age group (32.16%)(6)

4.3 Toxicants

Benzodiazepines, Tramadol, and TCAs are frequently prescribed pharmaceuticals. This study shows that prescribed poisons are more prevalent poisons in contrast with other studies that revealed that poisoning using agricultural chemicals is a major concern(7).

4.4 Intentionality

The graph indicates that most cases (61%) are due to purposeful exposures. This data indicates a notable prevalence of self-harm or intentional substance consumption within the examined group. This study disagrees with previous

studies that show the predominant accidental toxicities in emergency poisoning(8)

4.5 Severity

The high percentage of "Severe, including CVS alteration" cases suggests that cardiovascular complications are a major concern.

While there were fewer mild cases, moderate cases indicated that a significant number of patients required medical attention and monitoring.

The "Severe including CNS alteration" cases, though the smallest group, highlight the occurrence of severe neurological complications, which can have serious consequences.

This study is compared with another study that revealed that the Poison Severity Score analysis yielded 52.6% of cases classified as minor, 20% classified as moderate, and 27.3% without any symptoms(9).

4.6 Interventions

According to the data, the most common intervention appears to be drug treatment, which accounts for fifty percent of all instances. This suggests that many cases may need particular antidotes or supportive drugs. Considering that the percentage of instances that were seen was very high (16%), it is possible that some cases do not require aggressive intervention and can be managed conservatively. In fewer cases, gastric lavage, activated charcoal, and dilution are utilized. This is most likely because the nature and severity of the poisoning are considered. This study could be compared with a cross-sectional study in Saudi Arabia, highlighting the critical role of timely interventions and specialized toxicology support(10).

5. Conclusion and Recommendations

5.1 Conclusion

This study sheds light on acute toxicity patterns and management. Males have higher poisoning, likely due to riskier behaviors and occupational exposure. The high proportion of deliberate occurrences (61%) shows mental health and socioeconomic support are needed immediately. Most afflicted individuals are over 25, suggesting that economic hardship and chronic health concerns may lead to substance abuse and self-harm.

In contrast to studies on agricultural pesticide poisoning, this study emphasizes the significance of prescription drugs, including benzodiazepines, tramadol, and TCAs, in toxicity cases. Medical intervention is needed for severe cardiovascular and neurological problems. Drug treatment is the most prevalent treatment, along with conservative management.

These findings highlight the need for comprehensive prevention, mental health assistance, and toxicology services. Increased early action and medical availability can greatly minimize acute poisoning.

5.2 Recommendations

1. **Mental Health Support & Awareness:** Implement community-based programs to combat the high occurrence of intentional poisoning.
2. **Preventive Measures & Public Education:** Run educational programs on prescription medication usage and poisoning hazards.
3. **Toxicology & Emergency Response Improvement:** To improve toxicology services and ensure antidotes and supporting therapies are available in emergency rooms.
4. **Policy and Regulatory Actions:**

Enhance rules for high-risk prescription drug sales and use to prevent misuse, enhance patient outcomes, and provide nationwide guidelines for standardized poisoning management.

5: Conduct additional research to:

- ✓ Examine socio-economic and psychological aspects influencing intentional poisoning.
- ✓ Study long-term effects of poisoning and treatment outcomes to enhance patient care.
- ✓ Develop location-specific interventions by analyzing regional variances in poisoning patterns.

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جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الزهراوي الجامعة قسم الصيدلة 2024-2023

العوامل المساهمة في التسمم الحاد لدى البالغين: دراسة بأثر رجعي لحالات التسمم الحاد وإدارتها في قسم الطوارئ بمستشفى الحسيني التعليمي، كربلاء، العراق

مشروع بحث تخرج

مقدم الى كلية الزهراوي الجامعة /قسم الصيدلة كأحد متطلبات نيل شهادة البكالوريوس في علوم الصيدلة

من قبل

نور الهدى حسن مطر

زهراء خالد عبد الهادي

مريم سعد فاضل

زهراء حسن مجلي

علي صالح غازي

بإشراف:

م.د. لفته فايز كاظم

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