

Original Article**ACUTE POISONING AMONG ADULT FEMALES ADMITTED TO
ALEXANDRIA POISON CENTER – EGYPT****Wael Saad Kholeif**Forensic Medicine and Clinical Toxicology Department, Faculty of Medicine,
Alexandria University, Alexandria, Egypt**ABSTRACT**

Poisoning is a common cause for attending many hospitals. Females poisoning is a growing health problem especially in the developing countries. So **the aim** of this work was to assess the pattern of acute poisoning among female patients admitted to Alexandria Poison Center, Egypt. **Subjects and methods:** A cross-sectional retrospective study was performed on acutely intoxicated female patients, age above 18 years old admitted to Alexandria Poison Center for a duration of six months from the 1st of September 2021 till the last of February 2022. A checklist was used to collect data from poison center patient's admission files. The study done on 170 intoxicated adult female patients. **Results:** the mean age of the studied cases was 30.92 ± 15.22 year. The studied female patients were from Alexandria, El Behera, Matrouh and Kafr El Sheikh Governorate, most of them were from Alexandria (49.4%). The majority of the cases were housewives (48.8%) and students (40.6%). Suicidal poisoning was more common than accidental poisoning among studied cases. Pesticides were the most prevalent toxins involved in acute poisoning representing 35.3 %. Among all the cases, 52.9% were discharged, 30.0 % were admitted to poison center ward, 14.7% were admitted to ICU and 2.4 % died. **Conclusion:** that adult females were the most susceptible for acute poisoning. Most of the cases were housewives and students. Suicidal poisoning was more common than accidental poisoning among studied female patients. Pesticides were the most prevalent toxins especially aluminum phosphide followed by central nervous system drugs.

Keywords: Acute Poisoning, Adult Females, Suicidal Poisoning, Pesticides.**Corresponding author:** Wael Saad Kholeif**E mail:** waelkholeif@gmail.com

I. INTRODUCTION

Acute poisoning is considered as an over exposure to a poisonous substance harmful to health (Resiere et al., 2020).

Acute poisoning is a significant problem affecting both developed and developing societies, and it increases morbidity and mortality in many regions of the world. Annually, more than one million diseases are thought to be brought on by poisoning incidents (Ahuja et al., 2015).

Changing lifestyles and social norms are to blame for the daily rise in poisoning cases. It is not specific to any one area or socioeconomic class. They may be reliant on agricultural output, industrial growth and cultural practices pertaining to social conditions, and regional beliefs and practices. It must be dealt with as strongly as possible from a medical, psychological, and social perspective (Abdelhamid, 2021).

Poisoning is considered one of the most frequent medical emergencies presented among adult females. In many societies, female poisoning is a major issue that contributes significantly to the volume of Emergency department visits and hospital admissions (Bakhaidar et al., 2015).

Acute poisoning is a leading cause of death among females including unintentional and intentional poisoning (Rageh et al., 2023).

Unintentional poisoning (accidental poisoning) constitute large bulk of poisonings at young age and toddlers due to displaying normal exploratory behavior often characterized as “unintentional” (Ahmed et al., 2016).

Also, unintentional poisonings include poisonings committed among old age without intent, such as overdose of drug intake at the hospital or at home. Prescription drugs are implicated in a large number of these accidental poisonings (Ahmed et al., 2016).

Intentional poisoning (deliberate self-poisoning) is a prevalent health problem. The number of adult suicide attempts that

have been documented has steadily and significantly grown in the last decades (Lifshitz and Gavrilov, 2002).

It is one of the most common causes of mortality among females (Vijayakumar, 2015). In adult females who try suicide, self-poisoning occurs much more frequently than other self-injuries (Kasemy et al., 2022).

In Egypt, female poisoning is regarded as an a public health problem however, it is difficult to determine the accurate annual total and pattern of poisoning cases because the majority of these incidents are not reported (Abdelhamid, 2021).

So, the aim of the present study was to assess the pattern of acute poisoning among female patients admitted to the Poison Center in Alexandria Main University Hospital over a six-month period from the 1st of September 2021 till the last of February 2022.

II. SUBJECTS AND METHODS

A cross-sectional retrospective study was performed on acutely intoxicated adult female patients, age above 18 years old admitted to Alexandria Poison Center for a duration of six months from the 1st of September 2021 till the last of February 2022.

Inclusion criteria including: Acutely intoxicated adult female above 18 years old with moderate to severe toxicity.

Exclusion criteria: Age less than 18 years, a history of a chronic disease, and a presentation with concurrent acute pathology and intoxication.

A special checklist was used to collect data from poison center patient's admission files.

These data included demographic characteristics of the admitted patients, circumstances, types of incriminated poisons, outcome and history of previous exposure to poisoning.

Ethical considerations: Following the ethics committee's acceptance, data confidentiality was maintained throughout the study work. (IRB Number: 00012098, FWA Number: 00018699, Approval serial number: 0305110).

Statistical analysis of the data

The IBM SPSS software package, version 23.0, was used to input data and evaluate it. The Chi-square test was used to evaluate comparisons between groups for categorical factors (Monte Carlo). The 5% level was used to determine the significance of the obtained results (Kirkpatrick & Feeney, 2015).

III. RESULTS

The current work included 170 intoxicated adult female patients admitted to Alexandria Poison Center over a period of six months starting from the 1st of September 2021 till the last of February 2022.

The age of the studied cases was above 18 years with mean age 30.92 ± 15.22 year. The age group 18 – 29 years represent more than half of the studied cases (57.1%) while the age group 50 – 59 years showed the least percentage (3.5%). The studied female patients were from Alexandria, El Behera, Matrouh and Kafr El Sheikh Governorates, most of them were from Alexandria (49.4%). As regard occupation, housewives (48.8%) and students (40.6%) were the majority (Table 1).

Table (1): Sociodemographic data of acutely intoxicated females admitted to Alexandria poison center from the 1st of September 2021 till the last of February 2022 (n = 170)

Sociodemographic data	Number	%
Age (mean \pm SD)	30.92 \pm 15.22	
18 – 29	97	57.1
30 – 39	37	21.8
40 – 49	16	9.4
50 – 59	6	3.5
60+	14	8.2
Residence		
Alexandria	84	49.4
El Behera	53	31.2
Matrouh	28	16.5
Kaefer El Sheikh	5	2.9
Occupation		
Housewife	83	48.8
Employee	18	10.6
Student	69	40.6

SD: Standard deviation, n: number of cases

Suicidal poisoning was more common than accidental poisoning among the studied female patients representing 80 % & 20 % respectively (Table 2).

Table (2): Manner of intoxication in acutely intoxicated females admitted to Alexandria poison center from the 1st of September 2021 till the last of February 2022 (n = 170)

Manner of poisoning	Number	%
Suicidal	136	80.0
Accidental	34	20.0

n: number of cases

The most prevalent toxins involved in acute poisoning among studied female patients were pesticides representing 35.3 % (especially aluminum phosphide) followed by CNS drugs representing 23.5% while oral contraceptive pills, anti-thyroid drugs, salicylates, corrosive, kerosene, dimra and steroids showed the least encountered toxins each represent 1.2% (Table 3& Figure 1) .

Table (3): Types of toxic agents encountered in acutely intoxicated females admitted to Alexandria poison center from the 1st of September 2021 till the last of February 2022 (n = 170)

Toxic agents	Number of cases	Percentage in relation To whole cases (%)	Percentage in relation To toxin group (%)
Central nervous system drugs	40	23.5	
Antipsychotic	6	3.5	15.0
Antidepressant	8	4.7	20.0
Anti-epileptic	6	3.5	15.0
Sedative hypnotic	20	11.8	50.0
Cardiopulmonary medications	16	9.4	
Anti-hypertension	4	2.4	25.0
Cardiac medications	4	2.4	25.0
Pulmonary medications	8	4.7	50.0
Endocrine drugs	10	5.9	
OCP	2	1.2	20.0
Oral hypoglycemic	6	3.5	60.0
Anti- thyroid	2	1.2	20.0
Analgesics and anti-inflammatory drugs	22	12.9	
Non-steroidal anti-inflammatory	8	4.7	36.4
Salicylates	2	1.2	9.1
Paracetamol	12	7.1	54.5
Pesticides	60	35.3	
Insecticides	17	10.0	28.3
Rodenticides	16	9.4	26.7
Aluminum phosphide	27	15.9	45.0
Gas poisoning	6	3.5	
CO poisoning	6	3.5	100.0
Food poisoning	8	4.7	
Animal poisoning	4	2.4	
Scorpion bite	4	2.4	100.0
Chemicals	4	2.4	
Corrosive	2	1.2	50.0
Kerosene	2	1.2	50.0
Others	8	4.7	
Antihistamine	4	2.4	50.0
Dimra	2	1.2	25.0
Steroids	2	1.2	25.0

n: number of cases

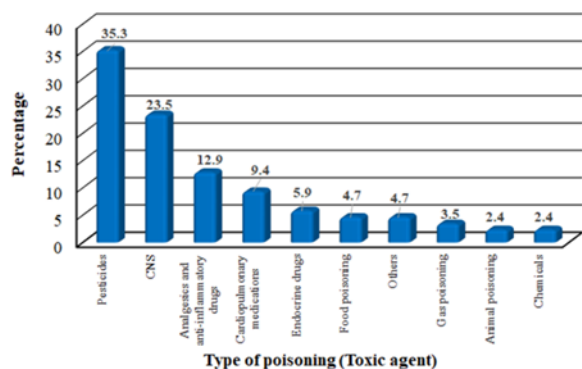


Figure (1): Types of toxic agents encountered in acutely intoxicated females admitted to Alexandria Poison Center from the 1st of September 2021 till the last of February 2022

Most of the patients (52.9%) discharged after observation, 30.0 % were admitted to ward, 14.7% were admitted to ICU and 2.4 % died. As regards the history of previous poisoning, 65.3% of the studied patients had no history of previous poisoning and 34.7% had history of previous poisoning (Table 4& Figure 2).

Table (4): Outcome and history of previous poisoning in acutely intoxicated females admitted to Alexandria poison center from the 1st of September 2021 till the last of February 2022 (n = 170)

Outcome (Fate)	Number	%
Discharge after observation	90	52.9
Inpatient wards	51	30.0
ICU	25	14.7
Death	4	2.4

History of previous poisoning	Number	%
No	111	65.3
Yes	59	34.7

n: number of cases

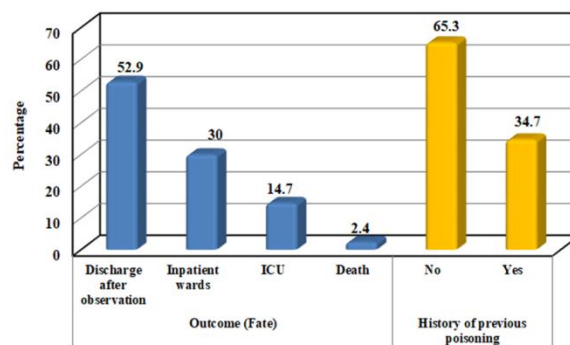


Figure (2): Outcome and history of previous poisoning in acutely intoxicated females admitted to Alexandria poison center from the 1st of September 2021 till the last of February 2022

Table (5) shows that most of suicidal female patients were at the age group of 18 – 29 years while the age group 50 – 59 years shows no suicidal attempts. Accidental poisoning was more common in the age group of 30 – 39 while the age group 40 – 49 years shows no accidental poisoning.

There was a significant difference between the circumstances of poisoning and different age groups (p<0.001).

Table (5): Relation between ages and manner of poisoning in acutely intoxicated adult females admitted to Alexandria poison center from the 1st of September 2021 till the last of February 2022 (n = 170)

Manner of poisoning	N	Age									
		18 – 29 (n = 97)		30 – 39 (n = 37)		40 – 49 (n = 16)		50 – 59 (n = 6)		60+ (n = 14)	
		No.	%	No.	%	No.	%	No.	%	No.	%
Suicidal	136	93	68.4	23	16.9	16	11.8	0	0.0	4	2.9
Accidental	34	4	11.8	14	41.2	0	0.0	6	17.6	10	29.4
χ^2 (MCp)		65.717* (<0.001*)									

χ^2 : Chi square test, MC: Monte Carlo, *: Statistically significant at $p \leq 0.05$, n: number of cases

Table (6) shows the relation between circumstances of poisoning and type of toxins where most of the patients (42.6%) committed suicide by using pesticides

followed by CNS drugs (27.9%) and toxins encountered in accidental exposure was food poisoning (23.5%) followed by gas poisoning (17.6%).

Table (6): Relation between manner of poisoning and type of poisoning in acutely intoxicated females admitted to Alexandria Poison Center from the 1st of September 2021 till the last of February 2022 (n = 170)

Toxic agent	Manner of poisoning			
	Suicidal (n = 136)		Accidental (n = 34)	
	No.	%	No.	%
Pesticides	58	42.6	2	5.9
CNS	38	27.9	2	5.9
Cardiopulmonary medications	14	10.3	2	5.9
Endocrine drugs	6	4.4	4	11.8
Analgesics and anti-inflammatory drugs	20	14.7	2	5.9
Gas poisoning	0	0.0	6	17.6
Food poisoning	0	0.0	8	23.5
Animal poisoning	0	0.0	4	11.8
Chemicals	0	0.0	4	11.8
Others	6	4.4	2	5.9
$\chi^2(\text{MCp})$		88.338*(<0.001*)		

χ^2 : Chi square test MC: Monte Carlo

*: Statistically significant at $p \leq 0.05$

n: number of cases

IV. DISCUSSION

The World Health Organization (WHO) estimates that each year, poisons cause more than one million illnesses and 0.3 million fatalities globally (Abdelhamid, 2021).

Egypt is an agricultural as well as industrial country with about 100 million inhabitants. Due to the widespread use and accessibility of drugs and chemicals, especially pesticides, there is a high risk of exposure to poisoning (Kaka et al., 2022).

Despite intensive teaching programs and public awareness efforts, acute poisoning is still a common medical emergency (Molla et al., 2022).

So the present work aimed at assess the pattern of acute poisoning among female patients admitted to the Poison Center in Alexandria Main University Hospital over

a six-month period from 1st of September 2021 till the last of February 2022.

This study has been carried out on 170 intoxicated adult female patients with moderate to severe poisoning. Females are frequently subjected to the pressures of daily living and social stress. Adult females are more likely to experience emotional and life stress that result in displaying self-harm (Yip et al., 2011).

Furthermore, females are more likely than males to have suicidal ideas, and for them, self-poisoning is the simplest way to commit suicide, whereas males typically use more injurious methods (Crosby et al., 2011).

The age of the studied cases was above 18 years old. The age group 18-29 years represents more than half of the studied cases. These findings were explained by Sharma et al. (2010) who stated that the high rate of poisoning among adults was caused by self-poisoning brought on by failure in romantic relationships, failure in exams and problems adjusting to life with their parents or peers. According to the Annual Report of Poison Control Center, Ain Shams University Hospitals in 2011, adults in Egypt had the highest rate of poisoning due to the extreme emotional and financial difficulties that facing specific the adults age groups (Halawa et al., 2013).

In the present study, the majority of patients came from Alexandria and the rest of patients were from El Behera, Matrouh and Kafr El Sheikh Governorates. This might be explained by their proximity to the poison center.

Housewives were the most common affected age groups in the current study. This is consistent with Banerjee et al. (2014) who stated that housewives made up the majority of the intoxicated cases in their research.

Suicidal poisoning (80 %) was more common than accidental poisoning (20 %) among studied female patients. This

finding was similar to that reported by study of Shadnia et al. (2007) who investigated the acute poisoning pattern in Tehran-Iran and revealed that 79% of poisonings were intentional and 21% were unintentional.

In this work the most prevalent toxins were pesticides especially aluminum phosphide followed by central nervous system drugs. The risk of poisoning has grown due to extensive use of pesticides in agriculture, the broad variety of toxic products to which people of all ages are exposed due to rapid industrialization, exposure to dangerous chemical products and introduction of newer treatment drugs (Kiran et al., 2008). Insecticides were the most prevalent type of toxin involved the work done by Budhathoki et al. (2009). These results are similar to those reported in a study by Mostafa et al. (2014) where insecticides were the most common toxins reported in their study and then pharmaceuticals with central nervous system drugs.

The current study revealed that most of the patients (52.9%) were discharged after observation, 30.0% were admitted to poison center ward, 14.7% were admitted to intensive care unit and 2.4% died. This was quite close to the findings that were reported by Limjindaporn (2010). Jose et al. (2012) revealed that 2.5% of cases in their research died, while 90.1% were discharged after full recovery. Azemi et al. (2012) stated that 96.96% improved, while 3.4% died. The lower mortality rate may be due to rapid hospitalizations and the accessibility of critical care facilities (Jose et al., 2012).

In this study 65.3% of the studied patients had no history of previous poisoning and 34.7% showed had history of previous poisoning. This can be attributed to strong family care and psychological support were responsible for the large decreases in recurrent self-harm incidents (Brent et al., 2013).

In the current research that most of suicidal female patients were at the age group of 18 – 29 years while the age group 50 – 59 years shows no suicidal attempts. This could be attributed to adults encounter a variety of difficulties, including developing a sense of self, becoming independent, and expanding intellectually and physically. All of these are challenging tasks even in environments that are supportive and stable and many adults struggle to deal with life and ultimately attempt suicide and poisoning (Hawton et al., 2012). Similarly, the study of Bhat et al. (2012) showed that self-poisoning was common in late adolescence.

In this work accidental poisoning was more common in the age group of 30 – 39 while the age group 40 – 49 years shows no accidental poisoning. As this age groups are more susceptible to toxicity with CO, food poisoning and animal bite. Rietjens et al. (2022) in their study in Dutch Poisons Information Center found that most intoxications in older adults are accidental.

In the present research, most patients (42.6%) committed suicide by using pesticides due to its availability at a cheap price. Ingestion of pesticides was found to be the most frequent method of attempted suicide, according to a survey of the pattern of suicide methods used in the governorates of Minoufia, Gharbia, and Kafr El sheikh in the research done by Hassan et al. (2015). This could be attributed to the agriculture nature and the availability of a lot of pesticides in many houses in these areas. In contrary, Farzaneh et al. (2010) study in Tehran, Iran found that pharmaceutical preparations were the most frequently used suicidal agents as they were taken in 87.5% of the cases.

Also in this study most toxin used by accidental manner was food poisoning (23.5%) followed by gas poisoning (17.6%). In agreement with the present study, Mostafa et al. (2014) results showed that, food poisoning followed by gas

poisoning (the time of the study included winter months that increase gas poisoning incidence) account for the highest percentage of accidental poisoning.

This is a retrospective study done because the pattern of poisonings changes over time and self-poisoning become a major public health problems among females.

V. CONCLUSION.

- Adult females were exposed to acute poisoning. Most of the cases were housewives and students. Suicidal poisoning was more common than accidental poisoning among studied female patients. Pesticides were the most prevalent toxins especially aluminum phosphide followed by CNS drugs.

VI. RECOMMENDATIONS

- Health education about the effects of toxicity of pesticides and drug overdose is a crucial matter to reduce the magnitude of the problem.
- Family and psychological support in case of self-poisoning is important to prevent further attempts.
- Enhance the regulation for the use of pesticides especially aluminum phosphide.
- Further research is required throughout the Egyptian governorates in order to effectively solve this problem and to find more safe pesticides and to be sold with strict limitations.

VII. ACKNOWLEDGEMENT

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VIII. CONFLICT OF INTEREST

The publishing of this paper did not include any conflicts of interest.

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None.

X. REFERENCES

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الملخص العربي

التسمم الحاد بين النساء البالغات اللائي تم ادخالهم مركز الإسكندرية للسموم - مصر

وائل سعد خليف

قسم الطب الشرعي والسموم الإكلينيكية - كلية الطب - جامعة الإسكندرية، مصر

خلفية البحث: التسمم سبب شائع للحضور إلى قسم الطوارئ في العديد من المستشفيات. تسمم الإناث مشكلة صحية متزايدة خاصة في البلدان النامية. لذلك **الهدف من البحث:** تقييم نمط التسمم الحاد بين المريضات اللواتي تم قبولهن في مركز السموم بالإسكندرية، مصر. **طريقة البحث:** تم إجراء دراسة مقطعية بأثر رجعي على مريضات مصابين بالتسمم الحاد ، وتبلغ أعمارهن فوق 18 عامًا ، وتم قبولهن في مركز السموم بالإسكندرية لمدة ستة أشهر من 1 سبتمبر 2021 حتى نهاية فبراير 2022. تم اعداد قائمة مرجعية معدة مسبقًا لجمع البيانات من ملفات دخول المرضى بمركز السموم. **النتائج:** أجريت الدراسة على 170 مريضة بالغة في حالة تسمم. كان عمر الحالات المدروسة فوق 18 سنة بمتوسط عمر 30.92 ± 15.22 سنة. تمثل الفئة العمرية 18 - 29 سنة أكثر من نصف الحالات المدروسة. كانت المريضات الخاضعة للدراسة من محافظات الإسكندرية ، والبحيرة ، ومطروح ، وكفر الشيخ ، ومعظمهن من الإسكندرية (49.4%). كانت معظم الحالات من ربات البيوت (48.8%) والطلاب (40.6%) وكان التسمم الانتحاري أكثر شيوعاً من التسمم العرضي بين الحالات المدروسة. وكانت المبيدات أكثر السموم انتشاراً في حالات التسمم الحاد بنسبة 35.3% تليها أدوية الجهاز العصبي المركزي بنسبة 23.5%. تم إخراج 52.9% من المستشفى بعد الملاحظة ، 30.0% تم قبولهم في أجنحة المرضى الداخليين ، 14.7% تم قبولهم في وحدة العناية المركزة وتوفي 2.4%. 65.3% من الحالات ليس لها تاريخ سابق من التسمم. **الخلاصة:** كانت الإناث البالغات أكثر عرضة للإصابة بالتسمم الحاد. وكانت معظم الحالات من ربات البيوت والطلاب. كان التسمم الانتحاري أكثر شيوعاً من التسمم العرضي بين المرضى الإناث الخاضعين للدراسة. وكانت المبيدات أكثر السموم انتشاراً وخاصة فوسفيد الألومنيوم تليها أدوية الجهاز العصبي المركزي.

التوصيات:

- التثقيف الصحي حول آثار سمية المبيدات الحشرية والجرعات الزائدة من الأدوية هو أمر حاسم للحد من حجم المشكلة.
- الدعم الأسري والنفسي في حالة التسمم الذاتي مهم لمنع المزيد من المحاولات.
- تعزيز القيود الخاصة باستخدام المبيدات الحشرية وخاصة فوسفيد الألومنيوم (قرص الغلة).
- مطلوب المزيد من الابحاث في جميع أنحاء المحافظات المصرية من أجل حل هذه المشكلة بشكل فعال وإيجاد المزيد من المبيدات الآمنة وبيعها مع قيود صارمة.