

# Features, Pattern and Outcome of Acute Intoxicated Patients Presented to Zagazig Poison Control Unit, Egypt during 2022

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## Abstract

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**Background** Acute poisoning is a critical medical emergency that poses probable hazards as it leads to significant proportions of morbidity that affect the economy and development. **Objective** is to reveal features, pattern and outcome of acutely intoxicated cases presented to the Zagazig Poison Control Unit (ZPCU) for predicting and efficient handling of these emergencies. **Methods** It is a retrospective study including acute poisoning cases presented to ZPCU from January 2022 to December 2022. Patients were categorized into three age-related classes:  $\leq 20$  years, 21–40 years, and  $> 40$  years. **Results** ZPCU received 1191 cases during 2022. Patients  $\leq 20$  years old were predominant (45.3%). Females represented 63%. Intentional (suicidal) toxicity was most prevalent (59%). The majority of cases were in summer (36.4%). Medicinal prescriptions were the commonest cause (44.5%) particularly acetaminophen (11%) then clozapine (5.5%). House-hold chemicals signified 14% of cases chiefly Clorox bleach while rodenticide toxicity was 11%. Cases with aluminum phosphide toxicity signified 8.6 %. Mortality rate was 8.1% and almost death was in the age group (21–40 years) and was induced mainly by aluminum phosphide wheat pill (84.5%). Nearly 19% of patients needed ICU admission. **Conclusion** Acute intoxication is mainly suicidal. Therapeutic drugs were the commonest followed by household chemicals. Most cases needed hospital admission. Efficient GI decontamination plus supportive treatment had the upper hand in managing these cases. **Recommendation** Restrictive laws banning drug purchasing without formal prescriptions, and skilled educational plans to raise alertness about toxic compounds. Psychological supportive aids for patients with suicidal attempts.

## Key words

Acute toxicity, Suicidal, Outcome, Aluminum phosphide, Egypt

## Introduction

Acute intoxication is one of the global problems. It is a critical medical emergency which is liable for significant mortality rates and morbidities all over the world (Bandyopadhyay and Mandal 2017). Acute toxicity is defined as over exposure to a poisonous substance harmful to health (Resiere et al., 2020). According to World Health Organization (WHO) reports, there are about 0.35 million persons die annually due to exposure to several types of toxicants, annual records of acute toxicity may differ from one country to another being higher in the developing one (Eddleston et., 2008). Furthermore, acute toxicity is classified into intentional (suicidal) and unintentional (accidental). Intentional poisoning is most common among adult less than 30 years with a great intent to self-harm, whereas accidental poisoning is common among children, toddlers, and old age patients without intent during intake of their prescription drugs (Rageh et al., 2023).

Medications, used frequently in suicidal attempts, are OTC (Over-the-Counter) drugs, especially acetaminophen (paracetamol). Also, pesticides and household products are common source for both accidental and suicidal manners because of their availability. High income countries reported fewer rates of poisoning induced- death than low-income countries,

variations in incidence and pattern of acute intoxication might be correlated with many issues as economy, education level, social level, culture, religion plus xenobiotic accessibility (Wahba et al., 2021). The management of a case of poisoning is a challenging matter due to various types of toxicants so, it requires urgent evaluation, diagnosis and treatment, if completed well, a better outcome may be ensured. Diagnosis depends on history taking regarding type of toxin, delay period before presentation, co-morbidities, symptoms, signs, laboratory examinations and imaging (Boyle et al., 2009). Critically ill patients with severe toxicity, hemodynamic instability and organ failure necessitates intensive care unit admission for vigorous life support and specific antidote if available (Rajbanshi et al., 2018).

Several factors can contribute to the fulminant pattern of toxicity such as social troubles, poverty, easy access to chemicals, drugs, and toxic plants plus declined awareness to their toxic potentials with the risk of multiple routes of exposure as ingestion or inhalation or dermal contact (El Masry and Tawfik, 2013). Issues inducing the severity and outcome of intoxication in patients are undetectable as it is a challenging matter to determine the meticulous whole number of poisoning episodes in Egypt annually as the bulk of these episodes may be unreported (Tawfik and

Khalifa, 2017). It becomes a critical matter to predict and assess the rate, pattern, and prognosis of poisoned patients in hospitals and toxicology centers depending on demographic and clinical parameters. This can help governments to set a prevention strategy for such problems (Bhat et al., 2011).

Therefore, the aim of this study was to determine the features, pattern and outcome of acute poisoned patients presented to Zagazig Poison Control Unit (ZPCU) at Zagazig University Hospital (ZUH), Zagazig, Egypt over one year from the start of January 2022 till the end of December 2022.

## Subjects and Methods

### Study design and setting

A cross sectional, hospital based, retrospective study was implemented in ZPCU at ZUH on the intoxicated patients presented with acute toxicity over one year from January 2022 to the end of December 2022. Data were gathered from patients' documents which are present in the Medical Affairs Department at ZUH (The main hospital in Alsharkia governorate, Egypt). For accurate diagnosis of acute intoxicated cases, the following criteria were based; history of exposure, signs plus symptoms of the suspected toxidrome, medical examination, routine and specific investigations. Concerning sample size, all acutely intoxicated cases preserved in ZUH records were incorporated in the study in order to obtain a realistic evaluation of acute intoxication pattern, incidence and outcome among patients presented to ZPCU.

### Patients

Three categories of patients were created: group I included those under 20, group II included those between 21 and 40, and group III included those beyond 40. The collected data from patients' documents were incorporated in a special worksheet as follow: socio-demographic data (age, residence, gender, education, and marital condition), toxicological data (type of the toxic substance, timing and route of exposure, either coming directly or transferred from other hospitals, place of admission). Also, clinical examination data were collected as vital signs (temperature, pulse, respiratory rate and blood pressure); conscious level; and chest, abdominal and neurological assessment. In addition, results of routine and toxicological investigations were obtained as complete blood count, liver and kidney functions, coagulation profile, electrolytes, toxicological analysis and radiological data. Also, records of patients' outcome either admission or discharge, recovery or death were collected.

### Inclusion criteria:

All patients with acute intoxication presented to ZPCU at ZUH over one year, between January 2022 and the end of December 2022, were incorporated in this study.

### Exclusion criteria:

Chronic intoxicated patients, side effects or adverse drug reactions in addition to food poisoning cases were ruled out from this study.

### Ethical consideration:

This study work was permitted according to the regulations of the Institutional Review Board "IRB" of

Faculty of Medicine, Zagazig University (Number, ZUIRB: 10113/13112022). Also, personal information was kept nameless to guarantee data secrecy.

### Data Statistical analysis:

GraphPad InStat 3 (GraphPad Software Inc., 2236 Avenida de la Playa, La Jolla, CA 92037 USA) was used to tabulate and analyze the data. Quantitative data were labeled using lowest and maximum values (mean $\pm$  SD), and a value of (p less than 0.05) is considered statistically significant. Qualitative data were identified using numbers and percentages.

## Results

Data of acutely poisoned patients were collected from patients' documents recorded in the Medical Affairs Department at ZUH (A tertiary hospital in Alsharkia governorate, Egypt). In which, ZPCU receives all poisoned patients plus others sent from further medical facilities. Alsharkia is mainly an agricultural governorate and is divided into both rural and urban regions.

The total number of cases (n = 1191) was divided into 3 groups: group I (n = 539) included individuals under the age of 20, group II (n = 481) included patients between the ages of 21 and 40, and group III (n = 171) included patients above the age of 40.

In Table 1, the socio-demographic details of acutely poisoned patients are shown. The total number was 1191 patients; 750 were females (63%) while 441 were males (37%). The majority of acute poisoning was in the age group below 20 years (45.3%) of the cases then group II (40.39%) and lastly group III (14.31%). Regarding the patients' employment, 822 (69%) were unemployed. About 701 (58.8%) were single. Regarding seasonal variant, data showed a significant number of cases 434 (36.4%) were intoxicated during summer.

Table 2 illustrates the mode of poisoning; revealing that the majority of toxicity was intentional (suicidal) signifying 704 (59%) whereas accidental poisoning was fewer representing 487(49%) of the total patients. Regarding seeking medical services, 766 patients (64.3%) of the whole patients arrived at ZPCU directly, while 425 patients (35.6%) were referred from other hospitals with no significant difference.

Among the 1191 poisoned patients reaching the ZPCU, various symptoms have been observed, especially GIT symptoms: vomiting (684, 57.4%), and salivation (119, 10%). CNS symptoms were: dizziness (520, 43.7%), unconsciousness (278, 23.3%), tingling and numbness (47, 4%), and neurotoxic symptoms (6, 0.5%). Also, respiratory symptoms as difficulty breathing (327, 27.5%). The main CVS symptoms were: hypotension (94, 4%) and tachycardia (78, 3.3%). Whereas, asymptomatic patients were (130, 11%) (p<0.001). Numerous poisoning victims presented with multiple symptoms.

As regards the categories of poisons among the examined acutely intoxicated patients, the majority of patients (529, 44.5%) were intoxicated with different brands of therapeutic medications, including Analgesics: acetaminophen (paracetamol) in 131 patients (11%), ibuprofen in 49 (4.1%), aspirin 26 (2%),

diclofenac in 13(1%) patients and tramadol in 11 patients (1%) of all poisoned patients.

Antipsychotics: clozapine in 66 patients (5.5%). Tricyclic antidepressants (TCA) were noticed in 19 (1.6%) of all intoxicated patients. The anticonvulsant: tegretol (carbamazepine) was detected in 15 patients. Cardiotoxic drugs as beta-blockers (BBs) were detected to be accountable for toxicity in 54 (4.6%), and overdose with theophylline was detected in 11 patients (1%), digoxin in 9 patients (0.7%).

Both paracetamol and clozapine toxicity were predominant in group II (31.5%) and (15.4%) correspondingly with a high significant difference as ( $p < 0.001$ ). Ibuprofen was found to be dominant in group I (13.7%) while BBs were commonly abused in group III (25.8%). Despite sedative hypnotics (benzodiazepines (BNZ)) and oral contraceptive pills (OCPs) have the same incidence in poisoned patients (3.5%), BNZ was more found in group II and OCPs overdose was more noticed in group I. Overdose with Tonics (iron) was detected in 11 patients (1%) of all poisoned patients. Less frequently muscle relaxant toxicity (6, 0.5%). However, it was noted that 18 individuals (1.5%) had toxicity from unidentified drugs. Nearly 14% (166 patients) were exposed to household chemicals and Clorox bleach was the commonest (84, 7.2%) of household toxicity.

Furthermore, almost 131 patients (11%) had rodenticide intoxication, with group II (66, 13.7%) having the highest percentage. Insecticides were represented by 89 patients (7.5%) and were more predominant in group III (13.5%). Also, aluminum phosphide toxicity was responsible for toxicity in 103 patients (8.6%) of the whole intoxicated cases,

particularly in group III which express 12.3% of patients. Less commonly, hydrocarbons and envenomation were accountable for toxicity in 38 and 53 patients respectively. Carbon monoxide poisoning was found in 22 cases, while alcohol was administered by 20 cases. Moreover, scorpion stings were detected in 13 patients. However, one patient only was recorded as having botulism through ingestion of salted fish (Fesikh) ( $P < 0.001$ ) as presented in Table 3.

Table 4 revealed that 520 patients (43.7%) required ward admission while 225 patients (18.9%) required ICU admission. Also, 341 cases (28.6%) were managed, observed for a period of 12 hours, required no admission, and discharged to home. Whereas 105 patients (8.8%) refused admission, received first aid in ER, and were discharged with legal consent as revealed in Figure (1).

Moreover, this study detected the mortality rates of acutely poisoned cases admitted to ZPCU during the year 2022 as it revealed that 97 cases (8.1%) suffered fatal poisoning and died after hospital admission while 1094 cases (91.9%) survived. About 18 patients (1.64%) showed some complications. A major percentage of fatality was in group II (51 cases) ( $p < 0.001$ ) as presented in Figure (2). In addition, Table 4 shows the management plan of acutely poisoned patients where the majority of patients received more than one treatment choice. A number of 403 patients (33.8%) were managed by specific medications and antidotes according to the causative poison while supportive plus symptomatic therapy was mandatory in 686 patients (57.6%). GI decontamination by activated charcoal and gastric lavage was essential in 841 cases (70.6%).

**Table 1: Demographic characteristics of the studied acute intoxicated patients presented to ZPCU in 2022 (n=1191).**

Characteristics	Age groups						$\chi^2$	p-value
	≤ 20 years (n=539) 5.3%		20- 40 years (n=481) 0.39%		> 40 years (n=171) 14.31%			
	no.	%	no.	%	no.	%		
<b>Gender</b>								
Male (n=441, 37%)	192	35.6	160	33.3	89	52.0	19.922	0.001**
Female (n=750, 63%)	347	64.4	321	66.7	82	48.0		
<b>Occupation</b>								
Working (n=369, 31%)	15	2.8	219	45.5	135	78.9	432.031	0.001**
Not working (n= 822, 69%)	524	97.2	262	54.5	36	21.1		
<b>Marital status</b>								
Single (701, 58.8%)	525	97.4	174	36.2	2	1.2	696.247	0.001**
Married (446, 37.4%)	14	2.6	286	59.5	146	85.4		
Divorced (38, 3%)	0	0.0	21	4.4	17	9.9		
Widow (6, 0.5%)	0	0.0	0	0.0	6	3.5		
<b>Residence</b>								
Rural (591, 49.6%)	250	46.4	228	47.4	113	66.1	21.745	0.001**
Urban (600, 50.3%)	289	53.6	253	52.6	58	33.9		
<b>Season</b>								
Winter (235, 19.7%)	123	22.8	91	18.9	21	12.3	17.345	0.001**
Summer (434, 36.4%)	188	34.9	174	36.2	72	42.1		
Autumn (192, 16.2%)	74	13.7	94	19.5	24	14.0		
Spring (330, 27.7%)	154	28.6	122	25.4	54	31.6		

$\chi^2$  : Chi square test, \*\*: statistically highly significant ( $p < 0.001$ ), ZPCU: Zagazig Poison Control Unit. N: number

**Table 2: Manner of poisoning, seeking medical services and main symptoms of poisoning among the studied acute intoxicated patients presented to ZPCU in 2022 (n=1191):**

	Age classes						$\chi^2$	p-value		
	≤20 years (n=539)		20-40 years (n=481)		>40 years (n=171)					
	no.	%	no.	%	no.	%				
<b>Manner</b>										
Accidental (n=487, 41%)	362	67.2	72	15.0	53	31.0	294.556	0.001**		
Intentional (n=704, 59%)	177	32.8	409	85.0	118	69.0				
<b>Seeking medical services</b>										
Direct (n=766, 64.3%)	343	63.6	315	65.5	108	63.2	0.497	0.780		
Referred (n=425, 35.6%)	196	36.4	166	34.5	63	36.8				
<b>Symptoms*</b>										
<b>Neurotoxic symptoms</b>										
Headache (n=79, 3.3%)	9	0.8	21	2.5	49	11.4	287.107	<0.001**		
Unconscious (n= 278, 11.8%)	170	15.5	79	9.5	29	6.8				
Dizziness (520, 22%)	256	23.3	191	22.9	73	17.1				
Tingling (47, 2%)	6	0.5	23	2.8	18	4.2				
<b>GIT symptoms</b>										
Vomiting (n=684, 29%)	372	33.9	228	27.4	84	19.6				
Salivation (119, 5%)	54	4.9	43	5.2	22	5.1				
<b>Respiratory symptoms</b>										
Difficult breathing (327, 13.9%)	138	12.6	97	11.6	92	21.5				
<b>Cardiovascular symptoms</b>										
Tachycardia (78, 3.3%)	10	0.9	50	6.0	18	4.2				
Hypotension (94, 4%)	15	1.4	54	6.5	25	5.8				
Heamatotoxicity (3, 0.1%)	0	0.0	2	0.2	1	0.2				
Asymptomatic (130, 5.5%)	68	6.2	45	5.4	17	4.0				

$\chi^2$ : Chi square test, non-significant ( $p>0.05$ ), \*\*: statistically highly significant ( $p<0.001$ ), \*: more than one choice, ZPCU: Zagazig Poison Control Unit

**Table 3: List of toxins among the studied acute intoxicated patients presented to ZPCU in 2022 (n=1191).**

Type of poison	Age groups						$\chi^2$	p-value
	≤ 20years (n=539)		>20- ≤40years (n=481)		> 40 years (n=171)			
	no.	%	no.	%	no.	%		
<b>Therapeutic (529, 44.5%)</b>	<b>212</b>	<b>39.3</b>	<b>255</b>	<b>53.0</b>	<b>62</b>	<b>36.3</b>	178.40	0.001**
Analgesics (235, 44.4%)	91	42.9	121	47.5	23	37.1		
Acetaminophen (131, 11%)	43	20.3	80	31.5	8	13.1		
Ibuprofen (49, 4.1%)	29	13.7	17	6.7	3	4.9		
Aspirin (26, 2%)	10	4.7	13	5.1	3	4.9		
Tramadol (11, 1%)	5	2.4	5	2.0	1	1.6		
Diclofenac (13, 1%)	4	1.9	5	2.0	4	6.6		
Antipsychotics (Clozapine) (66, 5.5%)	19	9.0	39	15.4	8	13.1		
Cardiovascular (75, 14.2%)	28	13.2	30	11.8	17	27.4		
BBs (54, 4.6%)	16	7.5	22	8.7	16	25.8		
Theophylline (11, 1%)	7	3.3	5	2.0	0	0.0		
Digoxin (9, 0.7%)	5	2.3	3	1.2	1	1.6		
Sedative hypnotics (Benzodiazepine) (42, 3.5%)	8	3.8	34	13.4	0	0.0		
OCPs (42, 3.5%)	36	17.0	2	0.8	4	6.6		
Tonics (Iron) (11, 1%)	9	4.2	2	0.8	0	0.0		
Antiepileptic (Tegretol) (15, 1.3%)	7	3.3	4	1.6	4	6.6		
Muscle relaxants (6, 0.5%)	3	1.4	2	0.8	1	1.6		
Unknown (18, 1.5%)	5	2.4	9	3.5	4	6.6		
Antidepressants (TCA) (19, 1.6%)	6	2.8	12	4.7	1	1.6		

Table 3: Continued

Type of poison	Age groups						$\chi^2$	p-value
	≤ 20years (n=539)		>20-≤40years (n=481)		> 40 years (n=171)			
	no.	%	no.	%	no.	%		
<b>Household chemicals (166, 14%)</b>	<b>124</b>	<b>23.0</b>	<b>27</b>	<b>5.6</b>	<b>15</b>	<b>8.8</b>		
Clorox (84, 7.2%)	65	55.6	15	55.6	4	26.7		
Flash (38, 3.2%)	23	19.7	7	25.9	8	53.3		
Dettol (20, 1.7%)	15	12.8	2	7.4	3	20.0		
Phenol (11, 1%)	9	7.7	2	7.4	0	0.0		
Potash (6, 0.5%)	5	4.3	1	3.7	0	0.0		
<b>Rodenticides (131, 11%)</b>	<b>53</b>	<b>9.8</b>	<b>66</b>	<b>13.7</b>	<b>12</b>	<b>7.0</b>		
<b>Aluminum phosphide (103, 8.6%)</b>	<b>38</b>	<b>7.1</b>	<b>44</b>	<b>9.1</b>	<b>21</b>	<b>12.3</b>		
<b>Insecticides (89, 7.5%)</b>	<b>41</b>	<b>7.6</b>	<b>25</b>	<b>5.2</b>	<b>23</b>	<b>13.5</b>		
<b>Snake (53, 4.5%)</b>	<b>8</b>	<b>1.5</b>	<b>25</b>	<b>5.2</b>	<b>20</b>	<b>11.7</b>		
<b>Hydrocarbons (38, 3%)</b>	<b>27</b>	<b>5.0</b>	<b>5</b>	<b>1.0</b>	<b>6</b>	<b>3.5</b>		
<b>Hashish (26, 2%)</b>	<b>19</b>	<b>3.5</b>	<b>7</b>	<b>1.5</b>	<b>0</b>	<b>0.0</b>		
<b>Carbon monoxide (22, 1.8%)</b>	<b>12</b>	<b>2.2</b>	<b>8</b>	<b>1.7</b>	<b>2</b>	<b>1.2</b>		
<b>Alcohols (20, 1.7%)</b>	<b>2</b>	<b>0.4</b>	<b>14</b>	<b>2.9</b>	<b>4</b>	<b>2.4</b>		
<b>Botulism (1, 0.01%)</b>	<b>0</b>	<b>0.0</b>	<b>1</b>	<b>0.2</b>	<b>0</b>	<b>0.0</b>		
<b>Scorpion (13, 1%)</b>	<b>3</b>	<b>0.6</b>	<b>4</b>	<b>0.8</b>	<b>6</b>	<b>3.5</b>		

$\chi^2$  : Chi square test, \*\*: statistically highly significant ( $p < 0.001$ ), ZPCU: Zagazig Poison Control Unit. N: number. OCPs: oral contraceptive pills

Table 4: Admission, final outcome, complications and management done among the studied acute intoxicated patients presented to ZPCU in 2022 (n=1191).

	Age groups						$\chi^2$	p-value
	≤20 years (n=539)		>20-≤40years (n=481)		> 40 years (n=171)			
	no.	%	no.	%	no.	%		
<b>Admission</b>								
Ward (520, 43.7%)	231	42.9	219	45.5	70	40.9	30.996	0.001**
ICU (225, 18.9%)	75	13.9	99	20.6	51	29.8		
Observation (341, 28.6%)	173	32.1	131	27.2	37	21.6		
Refused (105, 8.8%)	60	11.1	32	6.7	13	7.6		
<b>Complications (n=18)</b>								
Acute liver cell failure (3, 16.7%)	2	33.3	1	12.5	0	0.0	10.750	0.216
Pneumonia (10, 55.6%)	1	16.7	5	62.5	4	100.0		
Blindness (1, 5.6%)	0	0.0	1	12.5	0	0.0		
Esophageal stricture/ perforation (2, 11.1%)	2	33.3	0	0.0	0	0.0		
Intermediate syndrome (2, 11.1%)	1	16.7	1	12.5	0	0.0		
<b>Final outcome</b>								
Recovery (1094, 91.9%)	507	94.1	430	89.4	157	91.8	7.397	0.025*
Death (97, 8.1%)	32	5.9	51	10.6	14	8.2		
<b>Type of toxin causing death</b>								
Aluminum phosphide (82, 84.5%)	29	90.6	40	78.4	13	92.9	9.809	0.023*
Carbon monoxide (5, 5.2%)	1	3.1	4	7.8	0	0.0		
Rodenticides (4, 4.1%)	1	3.1	2	3.9	1	7.1		
Insecticides (2, 2.1%)	1	3.1	1	2.0	0	0.0		
Other toxins (4, 4.1%)	0	0.0	4	7.8	0	0.0		
<b>Management#</b>								
Specific (403, 33.8%)	151	28.0	179	37.2	73	42.7	37.810	0.001**
Supportive & symptomatic (686, 57.6%)	302	56.0	268	55.7	116	67.8		
GI decontamination (841, 70.6%)	396	73.46	373	77.5	72	42.1		

$\chi^2$  : Chi square test, \*: statistically significant ( $p < 0.05$ ), \*\*: statistically highly significant ( $p < 0.001$ ), #: more than one choice, ZPCU: Zagazig Poison Control Unit. N: number

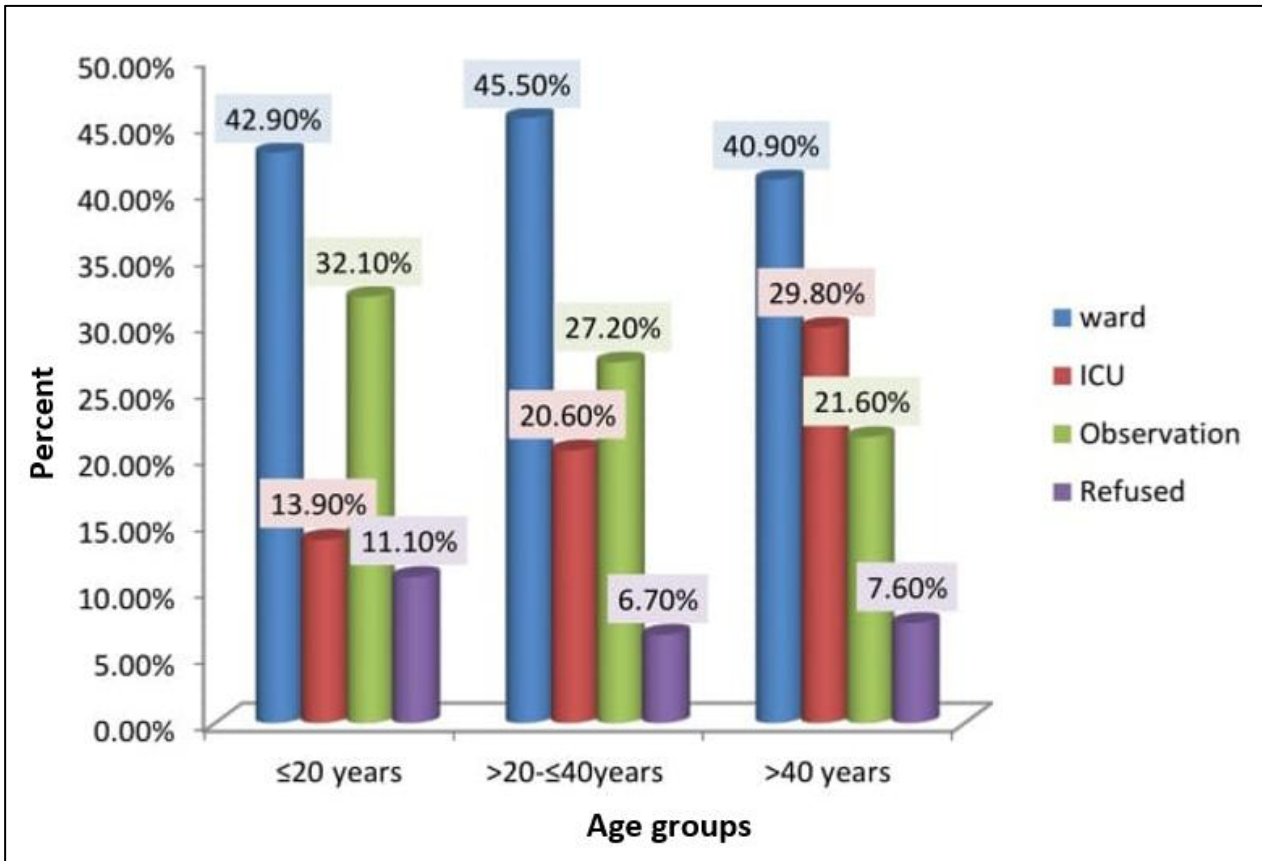


Figure (1): A bar chart showing admission pattern among the studied age groups presented to Zagazig Poison Control Unit in 2022

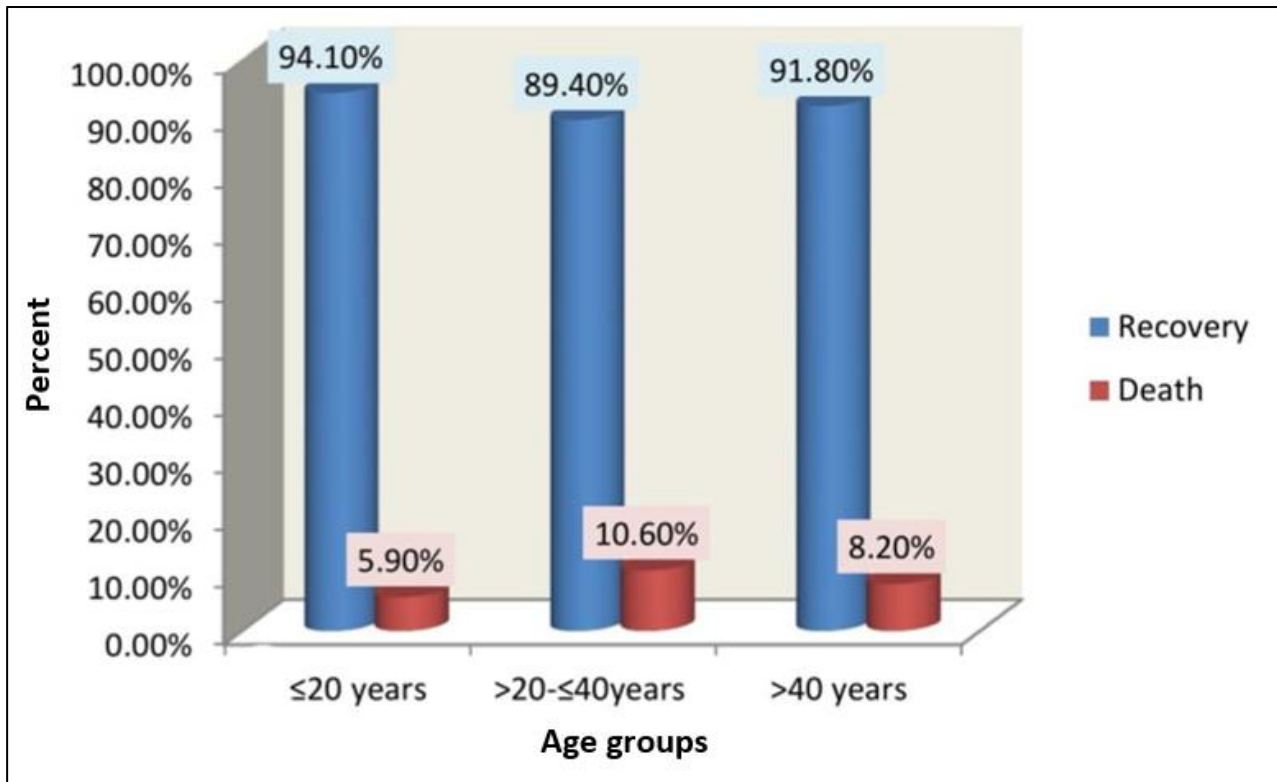


Figure (2): A bar chart showing the outcome of poisoning among the studied age groups presented to Zagazig Poison Control Unit in 2022

## Discussion

Worldwide, acute toxicity is a life-threatening medical emergency and a critical health problem that may cause high rates of mortality, particularly in developing areas. Despite aggressive awareness programs and educational health plans, poisoning causes more than 0.3 million deaths annually according to the WHO reports (Wahba et al., 2021). In Egypt, a major risk of toxin exposure may occur due to several issues; a huge number of population, and ease of access to insecticides and chemicals in both agricultural and industrial fields subsequently besides the informal obtainability of drugs (Kaka et al., 2022). Furthermore, enhanced recovery of poisoned patients and complications following toxicity depend principally on accurate management plus prompt diagnosis, which represent a great challenge to toxicologists and emergency physicians owing to the huge variants in the motifs of poisoning that anticipated many elements such as ages, social level, other comorbidities in addition to the type and amount of toxin (Rajbanshi et al., 2018). Despite intensive teaching programs and public awareness efforts, acute poisoning is still a common medical emergency (Molla et al., 2022).

So, the current work; a retrospective study, was designed to evaluate the clinical features, pattern and outcomes of poisoned patients presented to ZPCU at ZUH, Egypt over one year from January 2022 to the end of December 2022. The study results showed that the total number of poisoned patients was 1191.

In terms of socio-demographic information, the average age of patients who appeared in the current research was similar to that of earlier research, in which most patients who had acute poisoning presented between the ages of sixteen and thirty (Rajbanshi et al., 2018). Also, in a study performed in ZPCU 2023 by Khayal et al. the highest rate of acute poisoning was in the age group below 18 years representing 50.1% of cases (Khayal et al., 2024). Additionally, in a different study, the age group under seven years old accounted for 26.4% while the bulk of cases (59.3%) coming from 15 to 40 years old (Molla et al., 2022), which was in line with the previous annual reports from the Poison Control Center of Ain Shams University Hospitals (PCC-ASUH), which showed that the percentage of poisoned patients between the ages of 15 and 40 ranged between 59.2% and 63.5%. This was because this age group was the most active and had a lot of responsibilities related to their personal and professional lives, as well as their studies, romantic relationships, and parental expectations (Tawfik and Khalifa, 2017). Adults in Egypt had the highest rate of poisoning due to extreme emotional and financial difficulties that face specifically the adult age group (Halawa et al., 2013).

In the existing study, female predominance was obvious and signified 63% of poisoned patients. Women are more likely than males to experience emotional trauma that results in self-harming behaviors, which can be explained by the fact that women are more vulnerable to the psychological and emotional impacts of social stress and everyday life difficulties

(Rajbanshi et al., 2018). This was consistent with the studies conducted by researchers in Ethiopia and Egypt, where women made up 63.5% and 57.1% of the poisoned patients, respectively (Abo El-Noor, 2013) and (Adinew and Asrie, 2016). Also, another research done at 2019 in Egypt revealed that 45.2% of poisoned patients were men and 54.8% were females (Abdelhamid, 2021). Conversely, the findings were at odds with other studies carried out in India; claimed that there were more male poisoning victims than female ones (Anthony and Kulkarni, 2012) and (Prayag et al., 2016).

Moreover, the majority of patients (36.4%) were intoxicated during the summer, while the least number (16.2%) were during the autumn. Different regions of the world have also reported seasonal changes in acute poisoning. It was shown that in Iran, the seasons of greatest acute toxicity were spring (28%) and summer (27.5%), with lower percentages in winter (23.6%) and autumn (20.8%). In contrast, summer and autumn were the seasons with the highest number of acute poisoning cases in Gulf States such as Qatar (Wahba et al., 2021).

Regarding the mode of poisoning in this study, results showed that 59% was intentional toxicity (suicidal). Similarly, studies performed by Padmanabha et al. and Ahuja et al. in an Indian tertiary care hospitals noted that the most common mode of poisoning was suicidal intention (Padmanabha et al., 2014) and (Ahuja et al., 2015). Also, this finding is consistent with a study implemented in Iran detecting the acute poisoning pattern and found that 21% of poisonings were unintentional while 79% was intentional poisonings (Shadnia et al., 2007). Although there are strong religious norms against intentional self-killing and self-destruction, 51.5% of the patients they evaluated attempted suicide with intentional poisoning (Adinew and Asrie, 2016). Most often, acute intentional self-harm is a dynamic medical condition with an acute escalation of a long-term underlying psychiatric issue (Moghaddam et al., 2014). Suicidal thoughts may also be related to several social factors, such as deprivation, joblessness, stress from raising a family, major health concerns, substance misuse, troubles in school (as failing exams or receiving insufficient funding), and disappointment in romantic relationships (Prayag et al., 2016). On the other hand, according to the American Association of Poison Control Centers' 2018 annual report, just 19.1% of cases were intentional (Gummin et al., 2019).

Concerning seeking medical advice, the majority of patients (64.3%) traveled straight to ZPCU to seek treatment, which is in line with the attitude of the intoxicated patients and their family at the moment of intoxication. Though 35.6% attempted to obtain first assistance prior to arriving, there was no statistically significant difference observed between these groups. The goal of pre-hospital first aid for people who are intoxicated is to lessen the mortality as quickly as possible until the patient gets medical attention. Raising community knowledge of the need of administering first aid to intoxicated individuals is

imperative in order to prevent the absorption of the poison and maintain the patients' vital signs until they are transported to a hospital (Wahba et al., 2021).

In addition, the current study shows that the majority of patients (44.5%) were poisoned by medicinal preparations, particularly acetaminophen (paracetamol), which intoxicated 11% of patients, and clozapine, which intoxicated 5.5% of patients. In two percent of all patients, aspirin was the cause of toxicity. In contrast, fewer individuals had toxicity from Beta blockers, theophylline, benzodiazepines, Tegretol (carbamazepine), Brufen (ibuprofen), muscle relaxants, diclofenac, TCA, iron, and OCP. Nonetheless, eighteen patients (1.5%) who represented unsuccessful suicide attempts claimed to have taken high doses of one or more medicines, but they would not identify which drugs they had taken; as a result, their records were marked as toxic with unknown treatments. These results come in the same line with Khayal et al. report in which drugs have the upper hand of acute poisoning in ZPCU cases during 2023 (Khayal et al., 2024). Many different pharmaceuticals are available nowadays for the use as medications and many of them have the potential to be hazardous when taken in excess or used for suicide. Pesticides are the most prevalent cause of poisoning in Asian nations, especially in rural regions, while overdoses of analgesics, tranquilizers, and antidepressants are the most common cause in industrialized countries (Saglam et al., 2012). Furthermore, it was stated that poisoning from paracetamol overdose was common in Saudi Arabia, particularly in cases of young girls contemplating suicide (Almansori et al., 2015).

According to this current study, 14% of patients were intoxicated by chemicals used in domestic cleaning, disinfection, and washing. Two of the most often seen compounds were Clorox and Flash. These findings are consistent with earlier Saudi Arabian study. In Saudi Arabia, household chemicals are known to be a major cause of poisoning, accounting for 45% of instances of acute toxicity (Hegazy and Almalki, 2012). Regarding the management done, table 4 showed the specific type of approach that was used for patients experiencing acute poisoning. Since most patients were offered multiple treatment options, the overall number of each sub-group was higher than the total number of each group. According to the study, 33.8% of patients were prescribed a particular drug together with an antidote for the causing toxin. In contrast, 70.6% of patients underwent gastrointestinal decontamination. As the aim of the toxicologists is treating the patient not only the poison, so numerous intoxicated cases can be cured with general emergency cautions and aggressive symptomatic care methods (Muller and Desel, 2013). Using antidotes must be clearly indicated with the proper doses, understanding the potential complications with good monitoring for the end point of antidotal administration (Boyle et al., 2009).

With a percentage 8.1% mortality rate, these results were quite similar to study done at ZPCU at ZUH during the year 2023 reported that 3.1% of patients died and 96.9% of cases recovered (khyal et al.,

2024). Another research accomplished in urban India found that aluminum phosphide wheat pill poisoning alone was the major cause of acute poisoning death rate of about 2.8%, due to the high fatality of wheat pill with no available antidote (Singh et al., 2011). Whereas another study done in a tertiary care hospital at Ahmedabad showed a death rate of 15.8% (Joshi and Patel, 2015). Also, a study done at (PCC-ASUH) in Egypt documented that the death rate was 0.66% during 2019 (Abdelhamid, 2021). In addition, a death rate higher than 25% was recorded, as variations in death rates were attributed to various factors that influence the patient's outcome, such as the type of poison exposure, the amount of time delayed that passed between exposure and arrival at the poison control center, the accuracy of the intoxication severity assessment, plus availability of life-saving measures and transport services, and the availability of on-site laboratory diagnosis (Prayag et al., 2016).

Correspondingly, the combined effect of having strong laws against drug misuse and rigid regulations over prescription medications is probably what accounts for the lower death rates (Wahba et al., 2021). Patients with hemodynamic instability who require vasoactive medications had a poor prognosis due to delayed presentation, early signs of organ failure, acidosis, and other variables (Mathai and Bhanu, 2010). Augmented mortality in a different research for individuals with high SOFA and APACHEII scores (Ahuja et al., 2015), the same study also found that individuals in need of vasoactive support and mechanical breathing had a greater mortality rate.

## Conclusion

The existing work revealed that the common age group vulnerable to acute toxicity is less than 20 years, female patients were predominant and unfortunately almost cases were suicidal attempts. Large percentage of poisoned patients required hospital admission. Acute toxicity occurs frequently by medicinal prescriptions then household compounds and rodenticides. Efficient decontamination plus supportive treatment have the upper hand in managing frequent poisoned cases.

## Recommendations

1. Psychological care for patients with suicidal attempts.
2. Restrictive legislations to prevent consuming aluminum phosphide wheat pills.
3. Further studies from other Egyptian toxicology treatment units and poison centers for effective handling and estimate the magnitude of this problem.

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## نمط ونتائج حالات التسمم الحاد الواردة إلى وحدة مكافحة التسمم بالزقازيق بمصر خلال عام 2022

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### الملخص العربي

**مقدمة:** يعد التسمم الحاد من المشاكل الخطيرة التي تؤدي إلى زيادة معدلات الوفيات التي تؤثر على الاقتصاد والتنمية. يجب دراسة معدلات التسمم الحاد من أجل إيجاد حلول فعالة ضد هذه المشكلة. هدف الدراسة: تحديد معدل ونمط ومخرجات حالات التسمم الحاد الواردة إلى وحدة مكافحة التسمم بمستشفيات جامعة الزقازيق خلال عام 2022.

**نوع الدراسة:** دراسة استرجاعية شملت حالات التسمم الحاد الذين تم استقبالهم بوحدة مكافحة التسمم على مدار عام من يناير 2022 إلى نهاية ديسمبر 2022. وتم جمع البيانات من وثائق وسجلات المرضى في مستشفى جامعة الزقازيق. كان عدد المرضى 1191 مريضاً، وتم تقسيم المرضى إلى ثلاث فئات تتوافق مع أعمارهم: ( أقل من 20 عامًا، و 21-40 عامًا، وأكثر من 40 عامًا).

**النتائج:** أظهرت الدراسة أن الفئة العمرية الشائعة للتسمم الحاد هي أقل من 20 سنة، وكانت نسبة المرضى الإناث أكبر من الذكور (63%)، وكانت معظم حالات التسمم انتحارية (59%)، وشكل التسمم عن طريق تناول الأدوية غالبية الحالات (44.5%)، وخاصة الباراسيتامول والكولوزابين. كما كشفت الدراسة أن 14% من الحالات كانت تحت تأثير التسمم بالمواد الكيميائية المنزلية وخاصة الكلوروكس. كما بلغت نسبة حالات التسمم بمبيدات القوارض 11% بينما بلغت نسبة سمية فوسفيد الألومنيوم 8.6% كما كشفت الصورة السريرية عن مجموعة واسعة من الأعراض، ولكن بعضها كان بدون أعراض. وبشكل عام بلغت نسبة الوفيات 8% وكانت معظم الوفيات في الفئة العمرية (21-40 سنة) وكانت (10.5%) وكان السبب الرئيسي لها هو فوسفيد الألومنيوم قرص الغلة (84%).

**الخلاصة:** تعد الادوية والعقارات من أكثر حالات التسمم شيوعاً لذا ومعظم حالات التسمم احتاجت للحجز بوحدة مكافحة التسمم لاستكمال فترة العلاج

**التوصيات:** تقديم خطط وبرامج تثقيفية فعالة للمجتمع لرفع مستوى الوعي حول عوامل الخطر المسببة للتسمم الحاد وتقديم الدعم النفسي لمحاولات الانتحار وتفعيل الرقابة على الادوية وصرفها بوصفة طبية من قبل الاطباء المتخصصين.

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