

EVALUATION OF ACUTE TOXICITY OF CARDIOVASCULAR DRUGS IN CASES PRESENTED TO THE NATIONAL ENVIRONMENTAL AND CLINICAL TOXICOLOGY AND RESEARCH CENTRE DURING 2022 - EGYPT

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ABSTRACT

Background: Cardiovascular drug intoxication is a common health problem where the prognosis of patients depends on several factors. **Aim of the study:** This study aimed to evaluate acute poisoning of cardiovascular drug cases presented to the National Environmental and Clinical Toxicology and Research (NECTR) Centre. **Patients and Methods:** Demographic data and data concerning clinical presentations, investigations, lines of treatment, and outcome of the cases presented to the NECTR Centre with acute toxicity of cardiovascular drugs during the period from January 1 to December 31, 2022, were analyzed. **Results:** The study was conducted on 117 cases. The majority of cases were >18 years old (79.5%). Females were more commonly affected than males. Beta blocker toxicity was the most commonly reported drug intoxication, accounting for 37.1% of the cases. The manner of drug toxicity was suicidal in all cases. Sinus bradycardia was the most noted ECG change (29.1%), while the most noted ABG change was metabolic acidosis (12%). Regarding the outcome of the cases, the majority of cases improved and discharged (81.2%), and 60.7% of the cases were hospitalized for 24 to 72 hours. The Poison Severity Score (PSS) was a predictor of cardiotoxicity in digoxin cases. Both metabolic and respiratory acidosis were predictors of cardiotoxicity. **Conclusion:** Intentional poisoning by cardiovascular drugs poses a serious health concern, especially among adult females in Egypt. **Keywords:** Acute Toxicity, Cardiovascular, Drugs, Intentional Poisoning, Egypt.

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INTRODUCTION

Globally, cardiovascular system (CVS) disorders are the primary cause of morbidity and mortality (Amini *et al.*, 2021). Hypertension is a major cause of CVS diseases and deaths, particularly in low- and middle-income nations (Al-Makki *et al.*, 2022). CVS disorders, mainly ischemic heart and cerebrovascular diseases, are the main causes of death and account for 46% of all deaths in Egypt (Mohsen and Hakim, 2019). Acute poisoning from drug overdoses remains the most common cause of poisoning in the world. Over the past decade, it has been noticed that drug overdose incidence and prevalence have increased (Orsini *et al.*, 2017). Intentional ingestion by suicidal adults and accidental ingestion by children are the most frequent causes of overdoses with CVS medications. Adverse effects or medication errors (e.g., double dosing) are other causes of

intoxication. Toxicological effects can also result from interactions with drugs that affect inotropy, cardiac conduction, or metabolism via the cytochrome P450 enzymes (Zeinvand *et al.*, 2017).

One of the most challenging health problems in Egypt is the poisoning and fatalities caused by cardiotoxic agents. Records from the Poison Control Centre of Ain Shams University (PCCA) from 2003 to 2007 indicate that the most common reason for intensive care unit (ICU) admission was cardiovascular affection, either alone or in conjunction with other system involvement (Zaaqoq *et al.*, 2012).

Five of the most significant classes of CVS medications are beta-adrenergic blockers (BBs), calcium-channel blockers (CCBs), digoxin, thiazide, and angiotensin-converting enzyme inhibitors (ACEIs) (Zeinvand *et al.*, 2017). Significant systemic toxicity and high

rates of mortality are frequent with poisoning by BBs or CCBs (*Graudins et al., 2016*).

The history, clinical picture, and investigations were used to make the diagnosis. The presence of one or more of the clinical manifestations, which include dysrhythmias, heart failure, cardiac conduction abnormalities, hemodynamic instability, and/or ECG manifestations, was a prerequisite for the diagnosis of acute cardiotoxicity (*Hessler, 2006*).

THE AIM OF THE WORK

The aim of this work was to: Evaluate the acute poisoning of cardiovascular drug cases presented to the NECTR Centre during 2022; Identify the most common classes of drugs involved; Assess the most common clinical presentations, the severity of poisoning, and the patient's outcome in CVS poisoning and Predict indicators of the severity of acute CVS poisoning.

PATIENTS AND METHODS

Population of study:

This was a descriptive cross-sectional study that included 117 cases presented to the NECTR Centre with acute toxicity of cardiovascular drugs during the period from January 1 to December 31, 2022. The ethical committee of the Forensic Medicine and Clinical Toxicology Department and the Research Ethics Committee of Kasr Alainy, Faculty of Medicine, Cairo University, approved the study, **Code (MS: 213/2022)**.

Inclusion criteria:

- Confirmed acute CVS toxicity cases presented to the NECTR Centre.
- All ages.
- Both sexes.

Exclusion criteria:

- Patients who co-ingested other drugs rather than cardiovascular drugs.

Sample size:

Based on evidence from a previous similar study and by considering the acute toxicity proportion related to cardiovascular medication exposure among poisoning cases as a primary outcome, Epi-calc 2000 was used to calculate the sample size of this cross-sectional study. Assuming 80% power, a 0.05 level of significance, a 13% null hypothesis value, and an estimated proportion of 4.4%, the sample size will be 93 participants.

Considering the drop-out rate of 10%, the final sample size will be 102 participants (*Kalkan et al., 2011*).

Methods:

Data of all cardiovascular drug-induced acute toxicity cases that were presented to the NECTR Centre during the period of the study were collected and analyzed. Data were collected retrospectively from the toxicology reports of the NECTR Centre.

Cases were analyzed with respect to:

- **Demographic data of the patient:** age, sex, residence, and educational level.
- **Primary data to assess the patient:** route of exposure, manner of toxicity, duration between exposure and arrival at the NECTR Centre, duration of hospital stay, and the type of drug.
- **The severity of the poison** was assessed by using the Poison Severity Scoring System (PSS). The PSS is a classification scheme for cases of acute poisoning. Severity grades are classified according to *Persson et al. (1998)* as follows:
 - NONE (0): No symptoms or signs related to poisoning
 - MINOR (1): Mild, transient, and spontaneously resolving symptoms
 - MODERATE (2): Pronounced or prolonged symptoms
 - SEVERE (3): Severe or life-threatening symptoms
 - FATAL (4): Death
- **Outcome of the cases:** improved and discharged, discharged upon request, referred to the critical care unit (CCU).
- **Data concerning the clinical presentation of the patient:** gastrointestinal tract (GIT), respiratory, central nervous system (CNS), and cardiovascular system (CVS) manifestations.
- **Data of investigations and lines of treatment given to the patients.**

STATISTICAL ANALYSIS:

The Statistical Package for the Social Sciences (SPSS) version 28 was used for coding and entering data (*IBM Corp., Armonk, NY, USA*). Frequency (count) and relative frequency (percentage) were used to summarize the data. Chi-square (χ^2) test was performed to compare categorical data. When

the expected frequency was less than 5, the exact test was used instead (*Chan, 2003*). Statistical significance was considered when P values were less than 0.05.

Receiver Operating Characteristic:

Receiver Operating Characteristic (ROC) and Area Under the Curve (AUC) were used to determine the sensitivity, specificity, and significance (P value) of the independent predictors of the severity of cardiovascular drug toxicity. If the P value is less than 0.05, the test is significant for the prediction of the disease (*Hajian-Tilaki, 2013*).

RESULTS

The mean age of the studied cases was 27.4 ± 6.2 , with an age range from 15 to 42 years, where the majority of cases were >18 years (79.5%). Females represented 83.8% of the cases, and the majority of cases were educated (92.3%), as shown in **table (1)**.

Table (2) shows that beta blockers were the most commonly reported drugs, representing 37.1% of the studied cases, followed by cardiac drugs (28.23%) and diuretics (16.13%). However, lesser frequencies were reported for ACE inhibitors (9.67%) and calcium channel blockers (8.87%). Regarding BB intoxication, it showed a significant difference with age (P value = 0.002), while it showed a non-significant difference with sex, as shown in **table (3)**.

The drugs were taken intentionally and by the oral route in all cases, with a delay time between the administration of the drug and presentation to the center mainly 2 to 6 hours in 47.9% of the cases. Most of the cases showed minor toxicity according to the PSS (59%). The majority of cases improved and discharged (81.2%) through 24 to 72 hours of hospital stay (60.7%), as shown in **table (4)**.

The main GIT manifestations reported were nausea and vomiting (48.7%). Patients were mainly conscious at the time of examination (72.6%), O₂ saturation was normal in 99.1% of the cases, with normal temperature and normal vesicular breathing in all cases. Regarding CVS, hypotension (50.4%) and bradycardia (34.2%) were the main reported manifestations (**Table 5**).

As shown in **table (6)**, the most recorded ECG changes were sinus bradycardia (29.1%)

and 1st degree heart block (14.5%). Furthermore, 12.8% of the cases were found to have bradycardia associated with 1st degree heart block, with the highest percentages reported with BBs (46%), followed by digoxin (27%) and CCBs (13%) toxicity (**Figure 1**).

As shown in **table (7)**, metabolic acidosis was the most noted ABG change (12%), followed by metabolic alkalosis (7.7%). BB toxicity was mainly responsible for metabolic acidosis (28.8%), followed by digoxin toxicity (21.4%). On the other hand, 87% of respiratory acidosis cases were associated with BB toxicity, and 44.4% of metabolic alkalosis cases were seen with thiazide toxicity. Respiratory alkalosis was detected with BB toxicity in 43% of the cases (**Figure 2**).

Regarding electrolytes, hyponatremia was detected in 14.5% of the cases, while hypokalemia was found in 17.1% of the cases, and hyperkalemia in 15.4% of the cases. Regarding random blood sugar, it was normal in 65.8% of the cases, while hyperglycemia and hypoglycemia were reported in 22.2% and 12% of the cases, respectively, as shown in **table (8)**.

Hyperkalemia was mainly seen among digoxin toxicity cases (33%), followed by BB toxicity cases (28%), while hypokalemia was mainly seen among thiazide toxicity cases (35%), followed by BB toxicity cases (30%). On the other hand, hyponatremia was equally seen among both thiazides and BB toxicity cases (29%). Hypoglycemia was mainly seen among BB toxicity cases (86%) (**Figure 3**).

Activated charcoal was performed in 87.2% of the cases. Most of the cases were adequately hydrated (86.3%), and oxygen was supplied to 46.2% of the cases. Atropine was given to 17.9% of the cases (**Table 9**).

By using ROC-curve analysis, the PSS predicted cardiotoxicity in digoxin cases with P value <0.05 and AUC 0.673, while it had no significant role in predicting cardiotoxicity with other drugs. Both metabolic and respiratory acidosis were found to be independent predictors of cardiotoxicity, with P value <0.05 and AUC (0.771- 0.740) respectively (**Figure 4**).

Table (1): Socio-demographic data of the studied cases.

Mean age ± Standard deviation		27.4 ± 6.2
Socio-demographic data		Count (%)
Age	<18 years	24 (20.5)
	>18 years	93 (79.5)
Sex	Male	19 (16.2)
	Female	98 (83.8)
Residence	Urban	79 (67.5)
	Rural	38 (32.5)
Educational level	Educated	108 (92.3)
	Illiterate	9 (7.7)

Table (2): Comparison between different studies regarding types of cardiovascular drug poisonings.

	Zaaqoq et al. (2012) (year 2011)	Sahin et al. (2021) (2014 - 2017)	Our study (year 2022)
	Count (%)	Count (%)	Count (%*)
Beta blockers	14 (23.7)	20 (29.85)	46 (37.1)
Calcium channel blockers		8 (11.94)	11 (8.87)
ACE inhibitors		16 (23.88)	12 (9.67)
Cardiac therapy	17 (28.8) Digoxin	8 (11.94)	35 (28.23)
		Digoxin 3 (4.48)	Digoxin 16 (12.9)
		Trimetazidine cyclandelate 3 (4.48)	Nitroglycerin 13 (10.49)
		Amiodarone 1 (1.49) Metoxamine 1 (1.49)	Anti-ischemic (Ivabradine) 6 (4.84)
Diuretics		7 (10.45)	20 (16.13)
		Hydrochlorothiazide 3 (4.48)	Thiazides 10 (8.07)
		Furosemide 3 (4.48)	Loop diuretics 5 (4.03)
		Indapamide 1 (1.49)	K+ sparing diuretics 5 (4.03)
Lipid modifying agents		4 (5.97)	
Vasoprotectives		3 (4.48)	
Antihypertensives		1 (1.49)	
Anticholinesterases	28 (47.5)		
Total	59 (100)	67 (100)	124 (100)

*Percentages are based on the total number of drugs (124) not the total number of cases (117).

Table (3): Relation between beta blockers with age and sex among the studied cases.

		Age		P value	
		<18 years	>18 years		
		Count (%)	Count (%)		
Beta blockers	Yes	3 (12.5)	43 (46.2)	0.002*	
	No	21 (87.5)	50 (53.8)		
	Sex	Male	Female	P value	
		Count (%)	Count (%)		
	Yes	5 (26.3)	41 (41.8)		0.205
	No	14 (73.7)	57 (58.2)		

*P value < 0.05 is statistically significant.

Table 4: Pattern of toxicity, PSS, and outcome of the studied cases.

		Count (%)
History of Cardiovascular disease	Yes	29 (24.8)
	No	88 (75.2)
Manner of toxicity	Suicidal	117 (100)
Route of intake	Oral	117 (100)
Delay time	<2 hours	37 (31.6)
	2 to 6 hours	56 (47.9)
	>6 hours	24 (20.5)
Duration of hospital stay	<24 hours	24 (20.5)
	24 to 72 hours	71 (60.7)
	>72 hours	22 (18.8)
Poison severity score (PSS)	None	23 (19.7)
	Minor	69 (59.0)
	Moderate	23 (19.7)
	Severe	2 (1.7)
Outcome	Improved and discharged	95 (81.2)
	Discharged upon request	19 (16.2)
	Referred to CCU	3 (2.6)

CCU: Critical care unit.

Table (5): Clinical findings of the studied cases.

	GIT		Count (%)
		Nausea & vomiting	57 (48.7)
	Normal	60 (51.3)	
	CNS		Count (%)
	Eye	Normal	116 (99.1)
	Constricted	1 (0.9)	
Temperature	Normal	117 (100)	
Consciousness level	Conscious	85 (72.6)	
	Drowsy	24 (20.5)	
	Irritable	7 (6)	
	Coma	1 (0.9)	
Respiratory	Count (%)		
O ₂ saturation	100-90	116 (99.1)	
	90-80	1 (0.9)	
Respiratory rate	Normal	80 (68.4)	
	Tachypnea	18 (15.4)	
	Bradypnea	19 (16.2)	
Auscultation	Normal vesicular breathing	117 (100)	
CVS	Count (%)		
Pulse	Normal	67 (57.3)	
	Tachycardia	10 (8.5)	
	Bradycardia	40 (34.2)	
Blood Pressure	Normal	51 (43.6)	
	Hypotension	59 (50.4)	
	Hypertension	7 (6)	

GIT: Gastrointestinal tract CNS: Central nervous system CVS: Cardiovascular system.

Table (6): ECG findings of the studied cases.

Electrocardiogram (ECG) findings		Count (%)
	Normal sinus rhythm	48 (41)
	Sinus tachycardia	10 (8.5)
	Sinus bradycardia	34 (29.1)
	1 st degree heart block	17 (14.5)
	2 nd degree heart block	4 (3.4)
	QT prolongation	2 (1.7)
	QRS widening	2 (1.7)
ST segment	Normal	114 (97.4)
	Depressed	3 (2.6)
T wave	Normal	107 (91.5)
	Depressed	3 (2.6)
	Elevated	7 (6)

Table (7): ABG findings of the studied cases.

Arterial blood gases (ABG)	Count (%)
Normal	79 (67.5)
Metabolic acidosis	14 (12)
Respiratory acidosis	8 (6.8)
Metabolic alkalosis	9 (7.7)
Respiratory alkalosis	7 (6)

Table (8): Electrolytes and blood glucose level of the studied cases.

Electrolytes		Count (%)
Na	Normal	99 (84.6)
	Hyponatremia	17 (14.5)
	Hypernatremia	1 (0.9)
K	Normal	79 (67.5)
	Hypokalemia	20 (17.1)
	Hyperkalemia	18 (15.4)
Random blood sugar (RBS)		Count (%)
Normal		79 (65.8)
Hypoglycemia		14 (12)
Hyperglycemia		26 (22.2)

Na: Sodium K: Potassium.

Table (9): Management of the studied cases.

Management	Count (%)
Oxygen	54 (46.2)
Intubation and mechanical ventilation	4 (3.4)
Adequate hydration	101 (86.3)
NaHCO ₃	19 (16.2)
IV Glucose	84 (71.8)
Potassium	10 (8.5)
GIT decontamination by activated charcoal	102 (87.2)
Atropine	21 (17.9)
Ca gluconate and inotropes	17 (14.5)

NaHCO₃: Sodium bicarbonate IV: Intravenous GIT: Gastrointestinal tract Ca: Calcium.

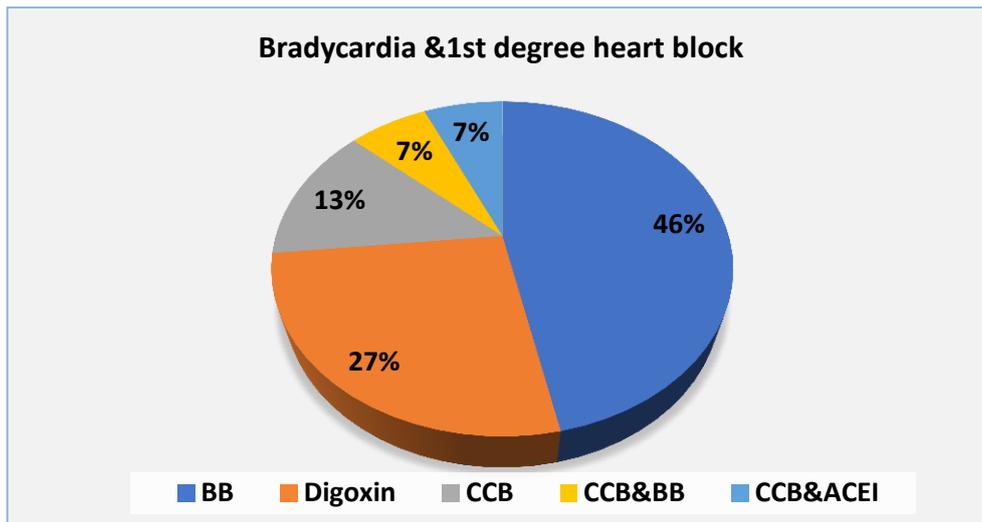


Figure (1): Drugs causing bradycardia and 1st degree heart block among the studied cases.

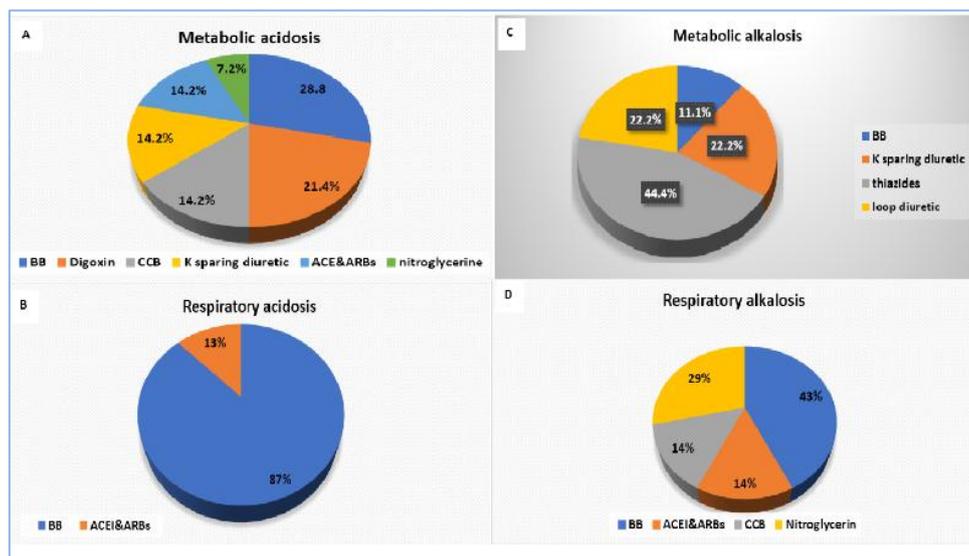


Figure (2): Drugs causing ABG changes among the studied cases.

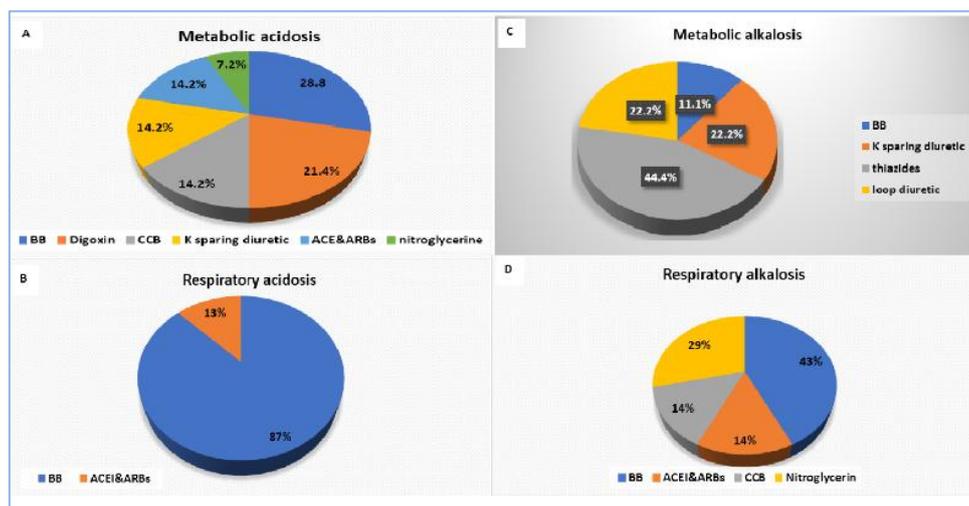


Figure (3): Drugs causing electrolyte changes, hyperglycemia, and hypoglycemia among the studied cases.

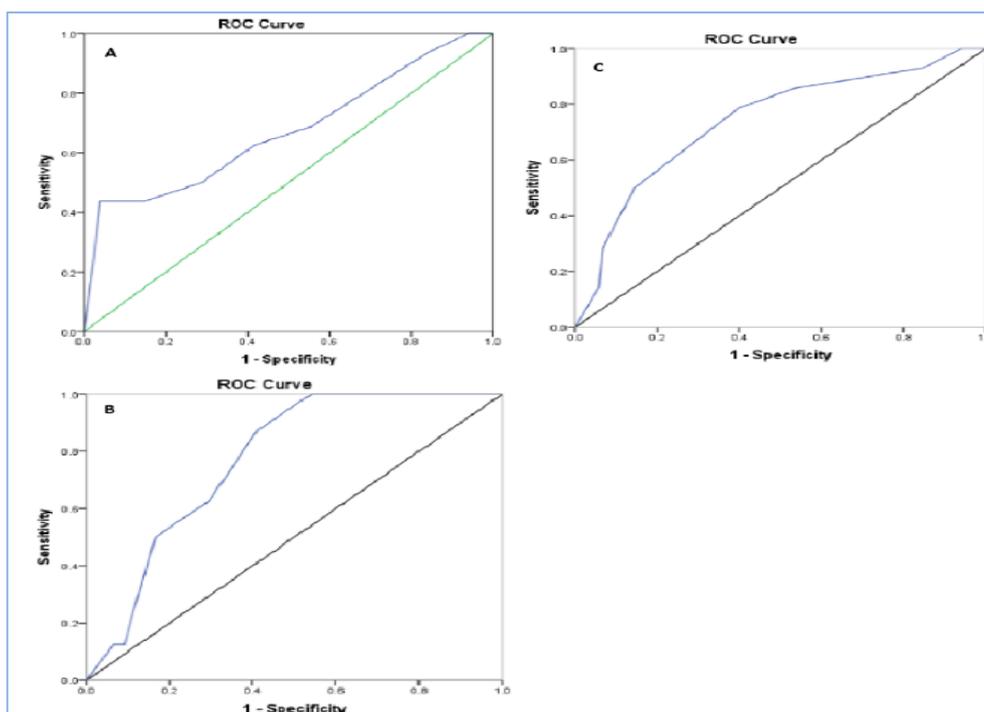


Figure (4): (A) ROC curve analysis of the PSS for prediction of cardiotoxicity in digoxin cases. (P value 0.027). (B) ROC curve analysis of metabolic acidosis for prediction of cardiotoxicity (P value 0.011). (C) ROC curve analysis of respiratory acidosis for prediction of cardiotoxicity (P value 0.004)

DISCUSSION

Our results showed that the most common age group presented was >18 years. This was consistent with *Hussien et al. (2018)* study conducted in the Poison Centre of Ain Shams University on acute cardiovascular drug toxicity, which showed that 87.5% of their patient sample was 18–40 years old. It also agreed with *Zeinvand et al. (2017)* study of cardiovascular drug intoxication, in which 90% were aged from 15 to 45 years old.

Our study revealed that females represented 83.8%, while males were only 16.2%. This agreed with *Hussien et al. (2018)* study, in which females represented 85% of the cases. Also, females were predominant (80.5%) in the study of BB acute toxicity conducted by *Eizadi-Mood et al. (2023)*.

The manner of toxicity was suicidal in all cases, which agreed with *Hussien et al. (2018)* study, in which all cases were suicidal as well. Also, *Elbasha et al. (2023)* reported that the majority (77.5%) of their study sample on cases presented with poisoning to the NECTR Centre were suicidal. Furthermore, a study conducted in

Turkey on 43 intoxicated patients with cardiovascular drugs revealed that the toxicity was mainly intentional (81.4%) (*Sahin et al., 2021*).

The high rate of intentional poisoning among females could be attributed to the fact that females try to commit suicide to attract attention and sympathy. Also, they have less resistance to psychological troubles than males. In addition, females prefer to commit suicide by medication rather than males, who tend to try more vigorous methods (*Freeman et al., 2017*).

The majority of cases in the current study were educated (92.3%). Higher achievers in education may be more vulnerable to suicide when facing failures, public shame, and high premorbid functioning (*Pompili et al., 2013*).

Suicidal behaviors were found to be significantly influenced by factors including depression, academic pressures, and loneliness among Egyptian university students (*Kabbash et al., 2023*).

The most common drug in our study was BBs (37.1%), and this agreed with the study of *Zeinvand et al. (2017)*, who listed that

BB poisoning accounted for the highest percentage (45.7%) in their patient sample. Other studies (*Hussien et al. 2018; Sahin et al., 2021*) found that BBs were the most common drugs of toxicity (50% and 29.85%, respectively).

However, *Zaaqoq et al. (2012)* study on cases admitted to the Poison Control Center of Ain Shams University Hospitals (PCCA), Cairo, Egypt, found that the most common agents were anticholinesterases (47.5%). There was an increase in the percentage of BB toxicity cases in our study compared to the studies of *Zaaqoq et al. (2012)* and *Sahin et al. (2021)*.

The high prevalence of toxicity with BBs could be attributed to their wide use as antihypertensive drugs; they continue to provide an inexpensive antihypertensive therapy option for developing countries (*Mitkova and Petrov, 2021*). *Metwally and Aly (2020)* study on polypharmacy and common unprescribed drugs listed BBs as the most frequently used over-the-counter drugs.

The second common drug in our studied cases was digoxin (12.9%). This was consistent with the results of *Hussien et al. (2018)* study, in which the second most common drug was digitalis (35%).

The relatively high number of digoxin toxicity cases in our study was consistent with the findings of an Egyptian study conducted by *Hassanin et al. (2020)* regarding the prescription of cardiovascular drugs in multiple different areas of the country, where digoxin was overprescribed. Digoxin use was observed in 36% of the Egyptian cohort, compared to 21% of the other countries in the European Society of Cardiology Heart Failure Long-Term (ESC-HF-LT) Registry (*GHE, 2014*).

GIT manifestations like nausea and vomiting were frequent and were reported in 48.7% of the cases. The same findings were reported by *Lauterbach (2019)*.

However, *Zeinvand et al. (2017)* noted that nausea and vomiting were seen in only a minor ratio (14.3%) of their studied cases. As regard CNS, our study showed that 20.5% of the cases were drowsy at the time of admission, but no seizures were reported.

This disagreed with *Zeinvand et al. (2017)*, who listed that 22.9% of the studied patients had seizures. Concerning CVS symptoms, the most noted symptoms in the patients were hypotension (50.4%) and bradycardia (34.2%). These manifestations were in accordance with *Hussien et al. (2018)* and *Ayhana et al. (2015)*.

It is essential to use ECG for the evaluation of suspected cardiovascular toxicity patients. Although bradycardia is commonly seen, a wide variety of dysrhythmias and heart blocks are possible. Normal sinus rhythm, junctional rhythms, sinus tachycardia, PR prolongation, QT prolongation, variable atrioventricular blocks, and bundle branch blocks are other ECG findings (*Palatnick and Jelic, 2020*).

Gastric lavage was not used in our study on any of the studied patients. GIT decontamination using activated charcoal was the most frequent management in 87.2% of the cases. This agreed with *Eizadi-Mood et al. (2023)* and *Lauterbach (2019)* studies, in which activated charcoal was given to almost 94% of the studied cases.

Good hydration was given to 86.3% of the patients, which went in line with the study of *Brusin et al. (2017)*.

Atropine was given to 17.9% of the patients. As a standard advanced cardiac life-support measure, atropine is currently recommended for symptomatic bradycardia (*Graudins, 2016*).

By using ROC-curve analysis, the PSS was found to be a significant predictor of cardiotoxicity in digoxin cases. Also, acidosis was noted as a predictor of cardiotoxicity.

The study of *Zaaqoq et al. (2012)* concluded that prediction and early diagnosis of cardiotoxicity are easy, available, cheap, and reliable via the implication of the PSS.

CONCLUSION

From this study, it is concluded that cardiovascular drug overdose represents a major health risk, particularly for Egyptian adult females. The Poisoning Severity Score can be used to predict the outcome of cardiovascular poisoning cases.

RECOMMENDATIONS

- Plethora of studies are needed to assess and compare different cardiovascular drugs and their adverse effects in Egypt.
- Enhancing female financial independence and social support to decrease the rate of suicidal attempts among females.
- Referral of the patients with suicidal intoxication to psychiatric consultation for assessment and follow-up to avoid recurrent suicidal attempts.
- Establishing educational and strategic plans is necessary for the prevention and control of self-medication abuse:
 - In addition to developing appropriate laws and regulations to restrict selling medications without prescriptions, an educational plan should prioritize raising public awareness of the risks associated with self-medication and its detrimental effects on health and the economy through well-crafted and impactful short messages distributed through the media, pharmacies, hospitals, and primary health care centres.
 - To assist policymakers in implementing intervention strategies and policies that are appropriate for Egypt and that take into account the contributing factors of this issue, the conduct of large national studies should primarily be done.
 - A strategic plan should include steps to: Review and refine over-the-counter medications in the Egyptian pharmaceutical constitution; Strengthen the Ministry of Health and Population (MOHP) and pharmacists' syndicate monitoring and surveillance systems; Incorporate the issue of self-medication into the curriculum of medical and paramedical students; Offer continuing medical educational programs for physicians and pharmacists that include training sessions on the subject; Increase the coverage of health insurance; Strengthen the role of family medicine; Allocate additional funds for research on self-medication, and encourage researchers to conduct additional research on the issue in various Egyptian governorates.

Disclosure of Interest

The authors declare that they have no competing interests.

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تقييم حالات التسمم الحاد بأدوية القلب والأوعية الدموية الواردة إلى المركز القومي للسموم الإكلينيكية والبيئية خلال عام ٢٠٢٢ - مصر

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الملخص العربي

مقدمة: يعد التسمم بأدوية القلب والأوعية الدموية مشكلة صحية شائعة حيث يعتمد تشخيص المرضى على عدة عوامل.

الهدف من الدراسة: الهدف من هذه الدراسة هو تقييم حالات التسمم الحاد لأدوية القلب والأوعية الدموية الواردة إلى المركز القومي للسموم الإكلينيكية والبيئية.

المرضى وطريقة البحث: تم تحليل البيانات الديموغرافية والبيانات الإكلينيكية والفحوصات وخطط العلاج ونتائج الحالات. أجريت الدراسة على ١١٧ حالة.

النتائج: كانت غالبية الحالات أكبر من ١٨ عامًا (٧٩.٥٪). وكانت الإناث أكثر تأثرا من الذكور. كانت سمية حاصرات بيتا هي التسمم الدوائي الأكثر شيوعاً بنسبة ٣٩.٣٪. وكانت طريقة التسمم الدوائي انتحارية في جميع الحالات. كان بطء القلب الجيبي هو التغير الأكثر ملاحظة في رسم القلب (٢٩.١٪)، في حين كان التغير الأكثر ملاحظة في غازات الدم الشرياني هو الحمض الأيضي (١٢٪). معظم الحالات تحسنت وخرجت (٨١.٢٪) بين ٢٤ و٧٢ ساعة (٦٠.٧٪).

الخلاصة: نستنتج أن التسمم الانتحاري بأدوية القلب والأوعية الدموية يشكل مشكلة صحية خطيرة، خاصة بين الإناث البالغين في مصر.