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Validity of Vital Signs, Coma Scales and Modified APACHE Score in Prediction of Prognosis and Outcome of Acutely Poisoned Patients

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ABSTRACT

Introduction: Acute toxicity management is a major medical problem in the whole world as poisoning is one of the most common causes for coming to hospital emergency departments. Early diagnosis and treatment in emergency department and ICU are critical for the poisoned patient to reduce hospital morbidity and mortality.

Objective: Evaluation of the validity of coma scaling systems as Glasgow coma scale (GCS), Reed scale, poisoning severity score (PSS), modified acute physiology and chronic health evaluation (APACHE) score (MAS) and vital signs as predictors of clinical course and outcome of acutely poisoned patients.

Patients and Methods: This retrospective study was carried out on 100 acutely intoxicated patients. They were selected from patients attended Sohag University Hospitals with age more than 18 years old who were in need for intermediate or intensive care unit. The study was conducted during the period from March 2018 to the end of February 2021. **Results:** this study revealed that 62% of the patients were in the age group 18-30 years old and 63% were females. The majority of them intoxicated by oral route (91%) and most of them were suicidal (68%). For the outcome, 75% of patients had been survived and 25% of patients died. PSS, Reed, MAS and GCS as coma scaling scores at admission showed significant difference between survivors and non-survivors of these patients. Systole and diastole as parameters of vital signs also showed significant difference between survivors and non-survivors. While, pulse, temperature and respiratory rate showed non-significant difference between survivors and non-survivors.

Conclusion: The study concluded that PSS, Reed scale, MAS, GCS, diastole and systole respectively are valid prognostic tools for the outcome in acutely poisoned patients.

Keywords: Acute poisoning, Validity of vital signs, Validity of coma scales, Prognosis of acute poisoning.

INTRODUCTION

Acute toxicity management is a major medical problem in the whole world as poisoning is one of the most common causes for coming to hospital emergency departments [(1)]. Early diagnosis and rapid treatment in emergency department and ICU are critical for the poisoned patient to reduce hospital morbidity and mortality [(2)]. There are many clinical factors that can affect the prognosis and outcome of the poisoned patients and affect decision of admission to ICU, for example type of toxic agent, delay in time to come to hospital and multiorgan failure that need immediate advanced life support which can lead to high mortality [(3)]. Also, one of these factors is vital signs measurement. It represents the critical first step for any clinical assessment as it reflects the degree of derangement that is occurring. So, as soon as possible detection of any abnormality in the vital signs typically correlates with rapid detection of changes in the cardiopulmonary state of the patient as well as up-gradation of the level of intervention if needed [(4)].

Additionally, there are many scoring systems used to assist to predict cases liable to death. These scoring systems include GCS, APACHE II score, simplified acute physiology score SAPS II. Also, the modified APACHE II system, which was used to assess critical cases in ICU [(5)]. However, the diagnosis and management are influenced by multiple factors, which make the pattern of poisoning is very challenge. Examples of these factors demographic and socioeconomic data of the patient, literacy rate, the age and comorbidities of the patient [(6, 7)]. Due to shortage of ICU beds, we need rapid decision and simple non-invasive tests for triaging patients in acute intoxications. This retrospective study designed for evaluation of the validity of different coma scaling systems as GCS, Reed scale, PSS and modified APACHE score as well as vital signs as simple predictors of clinical course and outcome of acutely poisoned patients.

PATIENTS AND METHODS

This study was a retrospective one conducted over three years from March 2018 to February 2021 on acutely intoxicated patients. 100 acutely intoxicated patients were selected from patients attended Sohag University Hospitals who fulfilled the study inclusion criteria.

Inclusion criteria: Age equal or more than18 years, acutely poisoned patients who were admitted the hospital either in the intermediate department or ICU.

Exclusion criteria: Patients less than 18 years old, patients with history of any disease or condition that may alter vital signs results, and patients presented with traumatic coma and pathological or metabolic causes.

Tools of the study:

1- A prepared sheet containing the demographic information of each patient such as sex, age, the type

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and amount of the drug or toxin consumed, and the delay time until admission was filled.

2- Vital signs at time of admission of patients to ICU or intermediate units were recorded.

3- The degree of coma was assessed by four different scaling scores.

A. Reed scale, four grades according to **Stanca, *et al.* [8]:** First degree coma: patients with slurred speech and response to pain and reflexes. Second degree coma: with preserved reflexes but unresponsive to verbal and pain. Third degree coma: with loss of reflexes but preserved vitals. Fourth degree coma: with loss of reflexes and unstable respiratory and cardiac functions.

B. Poisoning severity score according to **Cairns and Buckley [9]** classifies poisoning severity as follow: Degree 0 was considered if no symptoms or signs related to poisoning was recorded. Degree 1 was considered if there were mild or minor transient symptoms. Degree 2 was determined if there were prolonged and/or moderate symptoms. Degree 3 if there was severe, and life-threatening symptoms or signs. Degree 4 when fatal death occurred.

C. GCS (3-15 points) was calculated from assessment of motor, verbal and eye components.

D. Modified APACHE II Score (MAS) according to **Shokry *et al.* [10]** was calculated from 5 physiological parameters: mean arterial pressure, temperature, respiratory rate, heart rate and each component was marked from 0 being normal and 4 the most abnormal then the 5th parameter GCS score (15-GCS) was added.

Ethical conditions:

The study was approved from the Medical Research Ethics Committee of Faculty of Medicine, Sohag University, according to the commitment standard operating procedure guidelines, on 11/4/2021 under IRB Registration number: Soh-Med-21-04-22. Informed consent is not applicable as it is a retrospective study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis:

The collected data were given codes and arranged prior to computerization. The collected data were statistically analyzed using Statistical Package for the Social Science (SPSS) version 16 program to be polarized in simple graphic figures and tables. Comparison between the surviving and non-surviving cases was made by using independent t-test for continuous variables and the Pearson chi-square test for categorical variables. P value was considered significant if ≤ 0.05. A receiver operating characteristic (ROC) curve helped us to determine the proper cut-off value of vital signs, PSS, Reed scale, GCS and MAS points that assist in predicting outcome.

RESULTS

The ages of the studied patients ranged from 18 to 70 years. (62%) of the studied patients within the age group 18-30 years old, (20%) within age group 30-45years old and (18%) within age group 45-70 years. As regards the gender, 37% of the studied patients were males and 63% were females. As regards route of exposure, the majority of the studied patients were exposed to drugs and toxins by oral route (91%) followed by injection (5%)**.** According to mode of poisoning the majority of cases were suicidal (68%) followed by overdose mode (18%).

Regarding pulse rate, 56% of studied patients presented with normal rate, 33% presented with tachycardia and 11% presented with bradycardia. While, blood pressure was normal in 63%, 30% were hypotensive and only 7% were hypertensive. The respiratory rate was normal in 68% of cases while in 24% of patients was tachypnic and in 8% was bradypnic. Finally, temperature was normal in the majority of cases (94%) as shown in table (1).

Table (1): Vital signs measurements of the studied patients

Vital data	Number	Percentage %
Pulse:		
Normal	56	56%
Bradycardia	11	11%
Tachycardia	33	33%
Blood pressure:		
Normal	63	63%
Hypotensive	30	30%
Hypertensive	7	7%
Respiratory rate:		
Normal	68	68%
Bradypnea	8	8%
Tachypnea	24	24%
Temperature:		
Normal	94	94%
Hypothermia	2	2%
Hyperthermia	4	4%

According to GCS measurements at 24 hours of admission**,** it was mild in 61% of the studied patients, moderate in 9%, while it was severe in 30% of patients. As regards Reed scale measurements, the majority of patients were in grade 1 (45%), followed by grade 4 (28%), grade 3 (14%) and finally grade 2 (13%), while poisoning severity score showed that 35% were in grade (3). Both of grade (1) and grade (2) had the same percent 27%, 10% were in grade (4) and finally 1% was in grade (0). The distribution of MAS points at the time of admission of the patients was mild in 70% of cases, moderate in 20%, while it was severe in 10% of patients (Table 2).

Table (2): GCS, Reed scale, PSS and MAS points measurements in the studied patients

Severity of toxicity	**GCS***	**Number of patients**	**%**
Mild	**≥ 13**	61	61%
Moderate	**12-9**	9	9%
Severe	**≤8**	30	30%
Total		100	100%
Reed scale		**Number of patients**	**%**
Grade 1	Patients with slurred speech and response to pain and reflexes.	45	45%
Grade 2	Patients with preserved reflexes but unresponsive to verbal and pain.	13	13%
Grade 3	Patients with loss of reflexes but preserved vitals.	14	14%
Grade 4	Patients with loss of reflexes and unstable respiratory and cardiac functions	28	28%
Total		100	100%
Poisoning severity score		**Number of patients**	**%**
Grade 0	No symptoms or signs	1	1%
Grade 1	Minor and transient symptoms	27	27%
Grade 2	Moderate and prolonged symptoms	27	27%
Grade 3	Severe and life-threatening symptoms	35	35%
Grade 4	Fatal death	10	10%
Total		100	100%
MAS points groups**		**Number**	**%**
Mild	0-8	70	70%
Moderate	9-14	20	20%
Severe	15-22	10	10%
Total		100	100%

*GCS: Glasgow coma scale ** MAS: Modified APACHE II Score

Table (3) showed the site of patients' admission, where 62% of patients were admitted to the ICU, while 38% received treatment in the intermediate care.

Table (3): Site of hospital admission of the studied patients

Hospital admission		
Site of admission	**Number**	**%**
Intermediate care	38	38%
ICU	62	62%
Total	100	100%

The outcome of the studied patients showed that 75% of the studied patients have been survived and (25%) of the patients died.

Table (4): The outcome of the studied patients

Survivors versus non survivors	Outcome	Number	Percentage %	
Survivors	**Complete recovery**	**51**	**51%**	**75%**
	Discharge with complications	**24**	**24%**	
Non survivors	**Died**	**25**	**25%**	
Total		**100**	**100%**	

As regards relationship between outcome of the patients and toxic agents involved in the study, there was a highly significant statistical difference (P < 0.01) between the toxic agents and survivors and non-survivors. The main lethal agents involved, were zinc phosphide (6%) followed by aluminium phosphide, organophosphates & opioids (4% for each one of them), lithium & methanol (2% for each) and finally insulin, CCBs & BBs (1% for each). Concerning survived with complications, methanol was the most common causative agent (6%) followed by organophosphorous and theophylline with the same percent (3%).

Table (5): Chi-Square statistical analysis for comparing outcome of different toxic agents' exposure among all studied patients

Toxic agents		Died patients		Complicated patients		Complete recovery		Total		P-value
		No	%	No	%	No	%	No	%	
CVS Drugs	BBs	1	1	2	2	3	3	6	6	0.7 NS
	CCBs	1	1	0	0	2	2	3	3	
	Digoxin	0	0	1	1	2	2	3	3	
CNS Drugs	Antipsychotics	0	0	0	0	6	6	6	6	0.03*
	Benzodiazepines	0	0	0	0	2	2	2	2	
	Lithium	2	2	0	0	1	1	3	3	
Animal bites	Scorpion	0	0	0	0	1	1	1	1	-------
Pesticide	Ops	4	4	3	3	5	5	12	12	0.13 NS
	Carbamate	0	0	1	1	6	6	7	7	
Phosphide	Zinc phosphide	6	6	0	0	2	2	8	8	0.12 NS
	Aluminum phosphide	4	4	2	2	0	0	6	6	
Insulin and oral hypoglycemic	Insulin	1	1	0	0	0	0	1	1	0.08 NS
	Cidophage	0	0	0	0	2	2	2	2	
Drugs of abuse	Opioids	4	4	2	2	4	4	10	10	0.27 NS
	methanol	2	2	6	6	1	1	9	9	
	Tramadol	0	0	0	0	1	1	1	1	
	Amphetamines	0	0	0	0	1	1	1	1	
	Pregabalin	0	0	1	1	0	0	1	1	
	Cannabis	0	0	0	0	1	1	1	1	
CO		0	0	2	2	0	0	2	2	------
Theophylline		0	0	3	3	9	9	12	12	------
PPD		0	0	1	1	2	2	3	3	-------
Total		25	25	24	24	51	51	100	100%	
Pearson chi-square P value		0.004**								

*P < 0.05 (significant) **P < 0.01 (highly significant) ***P < 0.001 (very highly significant) NS: Non significant BBs: Beta-blockers CCBs: Calcium channel Blockers CO: Carbon monoxide Ops: Organophosphates PPD: paraphenyldiamine.

Tables (6) and table (7) showed that there was a significant statistical relationship between the outcome of poisoned patients and PSS, Reed, MAS and GCS as coma scaling scores, and both systolic and diastolic blood pressure. While no significant statistical difference were found in the triage respiratory rate, triage pulse, triage temperature between survivors and non-survivors.

Table (6): The relationship between MAS, GCS, Reed, pulse, systole, diastole and R.R and patient outcome

Variable		Died patients	Survived patients	Independent t-test
		N=25	N=75	p-value
MAS	**Mean ± SD**	**11.16 ± 4.7**	**4.7 ± 4.5**	**0.000*****
GCS	**Mean ± SD**	**7.68 ± 4.4**	**12.59 ± 3.49**	**0.000*****
Reed	**Mean ± SD**	**3.36 ± 1.18**	**1.24 ± 1.39**	**0.000*****
PSS	**Mean ± SD**	**3.4 ± 0.5**	**1.88 ± 0.82**	**0.000*****
Pulse	**Mean ± SD**	**96.0 ± 26**	**92.0 ± 27.03**	**0.6 NS**
Systole	**Mean ± SD**	**90.80 ± 21.97**	**115.47 ± 24.2**	**0.000*****
Diastole	**Mean ± SD**	**57.6 ± 14.5**	**74.0 ± 13.95**	**0.000*****
R.R	**Mean ± SD**	**19.80 ± 7.76**	**18.08 ± 5.9**	**0.24 NS**
Temperature	**Mean ± SD**	**36.5 ± 0.66**	**36.6 ± 0.66**	**0.47 NS**

*P < 0.05 (significant) **P < 0.01 (highly significant) ***P < 0.001 (very highly significant) NS: Non significant P > 0.05 SD: Standard deviation MAS: Modified APACHE II Score GCS: Glasgow Coma scale R.R.: respiratory rate PSS: poisoning severity score

Table (7): Linear regression analysis of MAS, GCS, Reed, PSS, pulse, systole, diastole, temperature and R.R to detect predictors of mortality

Predictors	Un-standardized Coefficients		Standardized Coefficients	Independent t-test	
	B	Std. Error	Beta	T	p-value
MAS	**-0.043**	**0.007**	**-0.525**	**-6.102**	**0.000*****
GCS	**0.051**	**0.009**	**0.498**	**5.687**	**0.000*****
Reed	**-0.15**	**0.022**	**-0.567**	**-6.822**	**0.000*****
PSS	**-0.28**	**0.033**	**-0.661**	**-8.713**	**0.000*****
Pulse	**-0.000**	**0.002**	**-0.053**	**-0.528**	**0.599 NS**
Systole	**0.007**	**0.002**	**0.414**	**4.499**	**0.000*****
Diastole	**0.013**	**0.002**	**0.454**	**5.040**	**0.000*****
Temperature	**0.047**	**0.066**	**0.072**	**0.714**	**0.477 NS**
R.R	**-0.008**	**0.007**	**-0.117**	**-1.166**	**0.24 NS**

*P < 0.05 (significant) **P < 0.01 (highly significant) ***P < 0.001 (very highly significant) NS: Non significant P > 0.05 SD: Standard deviation MAS: Modified APACHE II Score GCS: Glasgow Coma scale R.R: respiratory rate PSS: poisoning severity score

As regards ROC curve analysis to assess the predictors of mortality, table (8) illustrated that accuracy rate of PSS was the highest (92.0%), then Reed scale (86.6%), MAS scale (84.8%), GCS (80.9%), diastole (79.7%) and finally systole (76.7%).

Table (8): Sensitivity, specificity and accuracy rate of PSS, Reed, MAS, GCS, diastole and systole as predictors of mortality in the studied patients

Variable	Cut off point	AUC (Area under the curve)	p-value	Sensitivity (%)	Specificity (%)	PPV (%) (Positive predictive value)	NPV (%) (Negative predictive value)	Accuracy rate
PSS	>2	0.920	0.000***	100%	73.33%	55.5%	100%	92.0%
Reed	>1	0.866	0.000***	88.0%	61.3%	43.13%	93.8%	86.6%
MAS scale	>9	0.848	0.000***	64.0%	85.3%	59.2%	87.6%	84.8%
GCS	<9	0.809	0.000***	64.0%	81.3%	53.3%	87.1%	80.9%
Diastole	≤60	0.797	0.000***	76.0%	81.3%	57.5%	91.0%	79.7%
Systole	≤90	0.767	0.000***	68.0%	82.6%	56.6%	88.5%	76.7%

***P < 0.001 (very highly significant) MAS: Modified APACHE II Score GCS: Glasgow Coma scale PSS: poisoning severity score

By constructing a receiver operating characteristic (ROC) curve as shown in figures (1) and figure (2), the true-positive rate (sensitivity) against the false-positive rate (1-specificity) at each point were plotted. The optimum cut-off points using triage vital signs and coma scales to predict in-hospital mortality were SBP ≤ 90, DBP ≤ 60, PSS > 2, Reed >1, MAS scale > 9 and GCS <9.

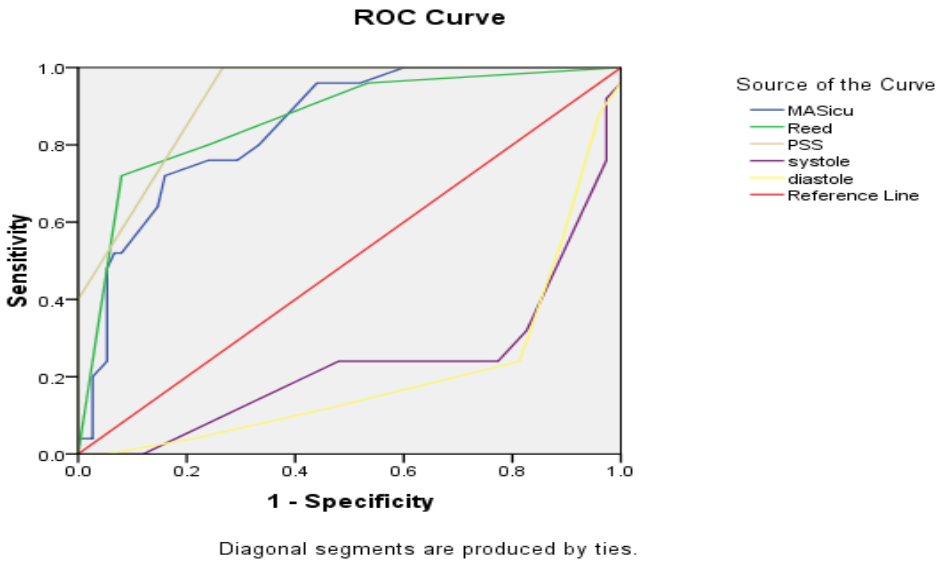

Figure (1): Receiver Operator Characteristic (ROC) curve of PSS, Reed, MAS coma scale, systole and diastole when greater result is positive.

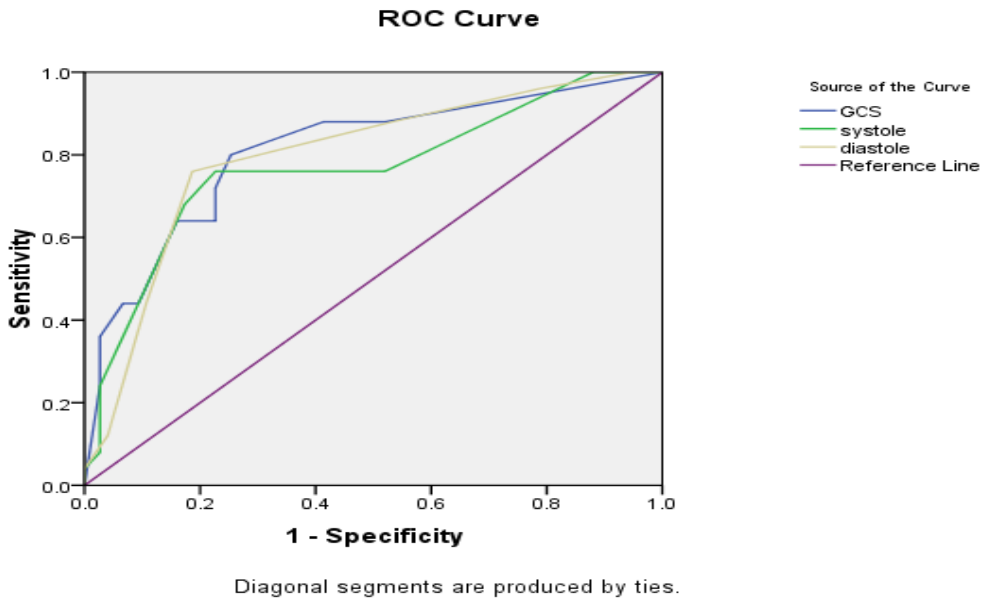

Figure (2): Receiver Operator Characteristic (ROC) Curve of GCS, systole and diastole when smaller result is positive.

DISCUSSION

In the current retrospective study, demographic, etiologic, clinical profile and coma scaling scores of 100 acutely poisoned patients admitted in Sohag University Hospitals were collected and analyzed. This study was conducted during the period from April 2018 to the end of February 2021. In the current study, 63% of cases were females while 37% were males. This is because emotions and mental thoughts in females are easily affected by various issues such as home violence and love stories failures [11, 12]. These results are in agreement with many other studies [13, 14, 15]**.** The age group 18-30 years old had the largest percentage with 62% of the total number of the patients. It is similar to **Zihni *et al.*** [15] results where age group 15-25 years old had the highest incidence with 25.4% of the total cases. Also **Hsin-Ling *et al.*** [14] found in their study that the age group 19–30 years were the highest percent of studied patients (29.4%).

Concerning the majority of the subjects reported in this study, 68%, attempted suicide while 18% of them were due to overdose and 11% of them were accidental. There were no homicidal cases recorded. This was expected as the majority of patients were females. According to **Konstantinos *et al.*** [16], women as a group are more frequently attempted suicide than men and the most prevalent methods of suicide attempts were pharmacological drugs abuse (42.31%). These results are in harmony with the results of **Zihni *et al.*** [15] as 87.2% of their studied

cases were self-poisoned in attempts for suicide, out of which 49.1% had committed suicide. The female: male ratio was 1: 0.8.

The main route of exposure in the studied patients was oral poison ingestion with percent of 91%. This finding was also observed in many other studies [17, 18, and 19].

There was a significant difference between various poisons identified as the cause of poisoning as the most recorded group was insecticides and rodenticides with percentage of 33%, followed by drugs of abuse with percentage of 23%. As agriculture is one of the main occupations in Sohag Governorate, as pesticides can be easily obtained and were misused for suicidal acts. The use of pesticides specially, organophosphorous compounds, have been increased in the whole world especially in the developing countries for both agriculture and home purposes due to their lesser risk of long-term accumulation in the environment because of their unstable composition and being easily hyrolyzed. All these circumstances increased the recorded organophosphate compounds poisoning cases especially in developing countries [20]. Other previous studies have reported also, that the organophosphorous compound was the most frequent toxin used by patients attending emergency departments with acute toxicity [7, 19].

Death rate due to acute poisoning in a well-established center with advanced life support is 1%–2% but it is higher in the centre with limited critical care resources and when the specific management started late [21]. The death rate in the current study was 25%, which was comparable to that reported in other studies as **Ahuja *et al.*** [19], who reported death rate 18%. While the mortality rate exceeding 25% was reported by **Prayag *et al.*** [22]. Difference in mortality rates may be attributed to many factors as the type of poison exposures, time elapsed from exposure to arrival to hospital, proper assessment of severity of poisoning, availability of life-saving measures and transport services, and provision of rapid laboratory diagnosis.

The most frequent fatal poisons in this study were zinc phosphide (6% of the studied cases) followed by Organophosphates (Ops), aluminium phosphide and opioids with (4%). This is in harmony with the results of **Hegazy and Elfiky** [23], who recorded death due to poisoning with aluminium and zinc phosphide in 60% of their deceased patients followed by organophosphates. In contrast to the present results is the result that was reported by **Abdelhamid** [24] where the most frequent cause of death was organophosphates 23.8% of total number of deaths. Organophosphates used to be the first cause of poisoning-related deaths in Egypt for several years as documented by the 2011-2015 Ain Shams Poison Control Center annual reports. Despite the importance of identifying toxic agents significantly associated with death, poisoning-related deaths varies widely and is affected by various factors like age, delay time, immunity deficiency and presence of other comorbidities.

Emergency physicians are challenged as regards the management of acute poisoning to have rapid diagnosis and treatment. They need relatives of the cases to help them to have detailed and proper history which is very valuable in diagnosis. Rapid full examination of the patients including vital signs measurement, pupil, coma, heart, neurologic, renal and heart examination is needed for clinical assessment. In this study, after using multiple logistic regression analyses, some easily measurable and useful parameters were identified for predicting poisoning-related fatality, including blood pressure (systolic and diastolic) and PSS, Reed, MAS & GCS as coma scaling scores. This information is routinely collected in the ED, and help emergency staff doctors to predict the prognosis of the poisoned patients and rapid ICU decision admission.

In this study, ROC curve analysis was used to make assessment of the predictors of fatality. The accuracy rate of PSS, Reed scale, MAS and GCS were 92.0%, 86.6%, 84.8% and 80.9% respectively with excellent discrimination. The accuracy rates of lower values of diastolic and systolic blood pressure were 79.7% and 76.7% respectively with acceptable discrimination as predictors of mortality. While, the accuracy rates of higher values of systolic and diastolic blood pressure were 23.2% and 20.3% respectively with non-acceptable discrimination as predictors of mortality. This classification was according to **Hilal *et al.*** [25] who reported that accuracy rate between 70% and 80% was described as acceptable discrimination and between 80% and 90% as excellent discrimination.

Using cut off values of PSS more than 2, Reed more than 1, MAS more than 9, GCS less than 9, diastole less than 60 and systole less than 90 resulted in poor prognosis with 100%, 88%, 64%, 64%, 76% & 68% sensitivity and 73%, 61%, 85%, 81%, 81% & 82% specificity respectively. In harmony with the present results, **Mood *et al.*** [26] showed that there were non-significant difference between the mean of temperature, pulse, respiratory rate and mean arterial blood pressure of survivors and non-survivors of mixed drug poisoning-induced coma in Iran. Also, **Jayashree and Singhi** [27] in India found that by using multiple regression analysis, hypotension at admission was the only vital sign considered independent predictor of mortality from acute poisoning. On the contrary **Yu *et al.*** [5] stated that the patients with vital signs in extreme values had bad prognosis than others. Patients with systolic blood pressure less than 100 or more than 150, heart rate less than 35 or more than 120 beat per minute, respiratory rate more than 20 and temperature more than 39 ºC are more liable to death. Also, **Assaf *et al.*** [28] in their study of outcome of acutely intoxicated patients in PCC-ASUH found that there were statistically significant difference between

respiratory rate, blood pressure and pulse between survivors and non-survivors group.

As regard GCS and MAS coma scales, our results are in accordance with **Shokry *et al.* [10]** study of acute poisoning with cardio-toxic effects in Sohag University Hospitals who revealed that GCS and MAS had excellent discrimination of death in the studied patients. The cut off values of GCS less than 9 and MAS more than 11 predicted mortality with 100% sensitivity for both scales and 72.3% and 74.5% specificity respectively. Also, **Mood *et al.* [26]** in Iran revealed that acute critical poisoning cases with GCS less than 10 had sensitivity 91% and specificity 92% with excellent discrimination. In addition, **Mood *et al.* [26]** mentioned that GCS and MAS had excellent discrimination of death when measured within 24 hours of admission.

As regard PSS, **Cairns and Buckley [9]** concluded that PSS is the best method to judge the severity of acute toxicity in spite of variation of age, demographic data and different toxic agents used to induce toxicity. Additionally, **Lionete *et al.* [29]** noticed that severe or fatal degree of PSS or GCS less than 10 at admission were associated with complications or death.

As regard Reed scale, the present results are in harmony with **Stanca *et al.* [8]** results as they concluded that the increase of the degree of Reed scale were associated with bad prognosis. Convulsions, disturbance of heart beats and respiratory distress syndrome were more severe and frequent with 4th degree Reed scale than the other lower degrees.

CONCLUSION

The present study demonstrated the validity of vital signs, coma scales and MAS in prediction of prognosis and outcome of acutely poisoned patients. It revealed that young and middle aged people were the most vulnerable for acute poisoning. In addition, females outnumbered males. Oral route was the main route of poisoning and suicidal poisoning predominated. Pesticides, theophylline and opioids were the most commonly reported toxic agents followed by zinc phosphide, methanol then beta-blockers and antipsychotic. Death rate in the study was 25%. Knowing the type of toxic agent consumed in acute toxicity of the patient is very valuable information to assist physicians to triage the patients if they used with simple valid tools of PSS, Reed scale, MAS, GCS and blood pressure measurements at admission.

Recommendations:

Epidemiological data is needed to be regularly updated to determine the most common dangerous toxic agents in the environment and searching for the reasons behind their availability and the outcome of toxicity by them. Preventive plans are needed to decrease frequency of exposure. Complete history and rapid screening tests is needed to identify the cause of acute poisoning, which will help emergency physicians in rapid management and assist in triage. For admission decision, especially with shortage of ICU beds, we need simple tools like PSS, Reed scale, MAS, GCS and vital signs measurement for triage of acutely poisoned patients.

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