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To Study About Criteria Required for Admission in Critical Care Unit for Poisoning Patients in a Tertiary Care Hospital

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Abstract

There have been seen many cases of intentional or accidental poisoning with drugs and chemicals in India and in the world. During the evaluation of patients who come with poisoning, after the hospitalization of the patient, the clinician must answer the questions about whether the patient needs medical treatment and if s/he needs such treatment, what the treatment and follow-up duration must be. It should be pointed out that especially the anamnesis of patients taken too many drugs for suicidal purposes is unreliable. Also in our study, it was found that systems aimed at predicting the severity of intensive care patients are mostly focused on the evaluation of sepsis patients. The clinical use of the poisoning severity score (PSS), which is used in the evaluation of patients with poisoning, has not reached the desired prevalence due to the examination of the large number of parameters. The most important limitation of our study is that it is done in one center and as the result, it could not be possible to examine some types of poisoning. The Ankara Poisoning Criteria, introduced in this study, is an appropriate, simple and practical scoring system that can be used in the decision for the indication of intensive care hospitalization and prognosis prediction in cases with poisoning.

INTRODUCTION

There have been seen many cases of intentional or accidental poisoning with drugs and chemicals in India and in the world. During the evaluation of patients who come with poisoning, after the hospitalization of the patient, the clinician must answer the questions about whether the patient needs medical treatment and if s/he needs such treatment, what the treatment and follow-up duration must be. It should be pointed out that especially the anamnesis of patients taken too many drugs for suicidal purposes is unreliable^[2]. For this group of patients, the uncertainty of what medication, how much and when it was taken makes the follow-up and treatment duration uncertain. Therefore, most of the patients are followed up in intensive care and intermediate intensive care units. However, many of these patients are discharged without the need for intensive care interventions. There are We believe that the creation of ideal scoring systems for patients with poisoning is essential for the determination of intensive care hospitalization necessity, duration of follow-up, mortality and morbidity. The aim of this study was to reveal objective criteria related to the intensive care follow-up needs of the patients admitted to the emergency services with the diagnosis of poisoning^[3-8].

MATERIALS AND METHODS

Patients who were admitted in emergency department in Sree mookambika college of medical sciences between May 2022 to April 2023, with poisoning emergencies. In addition, patients with more than one admission and hospitalization during this period were included in the study. Our study was conducted retrospectively by scanning patients' files. We created a database with suitable cases using a Microsoft program. We saved the following data from the database records of the emergency service and ICU: age, gender, vital signs, blood gas, biochemistry and complete blood counts., GCS, Apache II, SOFA, Qsofa, SIRS, MEWS scores., the needs of mechanical ventilator, positive inotrope, antidote, special treatment, dialysis., drugs or chemical substances caused poisoning and their amounts. We identified the groups of the drugs taken by patients by looking at their names, estimated drug dose, anamnesis and at the drug boxes left in the scene of accident. We could not measure the serum levels of the active substance in all patients due to the causes of poisoning were different and the levels of some substances could not be determined within hospital facilities. We designed a tool, consisting of 5 parameters, according to which the decision for hospitalization of a patient into intensive care unit is made. We estimated that if a patient meets one of these parameters, his/her hospitalization in the an ICU is required. We have come up with an idea that the patient group, which does not

meet any of those parameters, can be followed up in the outpatient or inpatient settings. While introducing these parameters, we have already taken into account the algorithms published in the literature^[2,4,5]. When designing this "decision" tool, we opted for simple parameters that could be quickly and easily accessible in the emergency service and we chose the parameters that could determine all vital functions. We determined the cut-off values from national and international guidelines for ICU admission⁶. We named our developed diagnostic tool as "Ankara Poisoning Criteria" (Table 1). Therefore, we compared the presence of treatments performed to patients, such as mechanical ventilation, dialysis, inotropic support and special antidote, which are required the ICU conditions, with the Ankara Poisoning Criteria. Statistical analysis was done using the statistical package for social sciences (SPSS). Different statistical methods were used as appropriate. Mean±SD was determined for quantitative data and frequency for categorical variables. The independent t-test was performed on all continuous variables. The normal distribution data was checked before any t-test. The Chi-Square test was used to analyze group difference for categorical variables. A p-value<0.05 was considered significant.

RESULTS AND DISCUSSIONS

Table 1: Ankara Poisoning Criteria

- 1) GCS must be <15,
- 2) Hypotension (systolic blood pressure must be 90 mm Hg),
- 3) Bradycardia (must be <60 beats/min) or tachycardia (must be >100 beats/min),
- 4) Lactate level must be high (>2.0)
- 5) The pH value must be acidotic or alkalotic (<7.35 or >7.45).

We compared the patients' scores gotten from the Ankara Poisoning Criteria with their LOS, whether they need inotrop or not, whether the dialysis and mechanical ventilation support were provided and with the specific treatment and antidote needs. Table 2: Distribution of scores of patients from scoring systems. We included in our study 316 patients aged ≥18 years hospitalized between 01 January 2016 and 31 December 2017 in the emergency intensive care unit of University of Health Sciences Medical School Ankara Health Care Center with the diagnosis of poisoning. 24 of these patients were excluded from the study because all their data could not be reached. The data obtained from 292 patients were evaluated. The mean age of the patients was 33,35 (min 18, max 90, st dev: 13,953). 65,4% (n=191) of the patients were female and 34,6% (n=101) were male. We share distribution of scores of patients from scoring systems

in Table 2. In 77.0% of patients (n=225) the pH value was in the normal range (7,350=normal pH=7,450). There was acidosis or alkalosis in 22.9% (n=67) of patients. In 28.7% of patients (n=84) we detected lactate as=2.0. 91.8% (n=268)

Table 3: General Characteristics

Length of Hospital Stay	1 day	%11,9
	≥ day	%88,1
Pulse rate	<60/ min or 100/min=	%9,5
	60-100/min	% 90,5
Hypotension	+	%3,7
	-	%96,5
GCS	15	%83,9
	≤14	%16,1
Inotropic support	+	%3,4
	-	%96,6
Mechanic Ventilation	+	%4,4
	-	%95,4
Dialysis	+	%1
	-	%99

of the patients were discharged after completing treatment in the intensive care unit. 7,2% (n=21) of patients were transferred to another department for further treatment or referred to another medical center. Three (1%) (n=3) of patients died. In table 3, we share LOS, tension, pulse rate, GCS, inotropes, mechanic ventilation and dialysis supports. 1 patient was hospitalized in the Department of Psychiatry due to ongoing suicidal thoughts. When all patients were evaluated within the scope of the Ankara Poisoning Criteria we concluded that 45.5% (n=133) of patients had a “zero” point. In this study, we compared of the Ankara poisoning criteria with treatment requirements of patients and values of the Ankara poisoning criteria with the criteria values of another intensive care unit (Table 4,5). The aim of this clinical trial is to introduce objective and easy-to-reach criteria that can be applied during the ICU admission of patients with poisoning. The results showed that patients who did not meet the criteria, set as the result of our study, did not need inotropic agents, dialysis, mechanical ventilation, special treatment and antidote and also showed that patients got low points in scoring systems such as APACHE II, SOFA, QSOFA, MEWS and SIRS. Therefore, we have come to the conclusion that an objective clinical evaluation tool that will evaluate blood gas, vital signs, GCS and whether a patient needs intensive care or not, can be created for patients with poisoning. The main decisive factor in the selection of these five criteria (Glaskow coma score <15, systolic blood pressure <90 mm Hg, bradycardia (<60 beats / min) or tachycardia (> 100 beats / min), acidosis (pH <7,359 or alkalosis (pH> 7,45) and serum lactate level >2.0 mmol / L), collected under the name of “Ankara Poisoning Criteria”, was that all these criteria were easily accessible. Another factor affecting our choice is the fact that the GCS represents the patient’s state of consciousness, systolic blood pressure and heart rates show hemodynamic problems in the patient if there

are any and the patient’s pH and lactate values provide information about the patient’s metabolic status. Today, both the national Advisory Center on Toxicology (114) approach and the general approach around the world show that clinicians should provide the follow-up at least 24 hours 3,9 to patients with poisoning and even this should be done under intensive care settings. However, when there is no need for intensive care, there are some cases of poisoning that are followed up in the intensive care unit for preventive purposes and as the result, limited number of intensive care beds are occupied, which is an important problem in the whole world’s medicine

Table 4: The Comparison of Values of the Ankara Poisoning Criteria with the Criteria Values of Another Intensive Care Unit

	Ankara criteria		P value
	Negative	Positive	
qSOFA	0	128	105
	≥1	5	54
SOFA	≤4	129	139
	≥5	4	20
SIRS	≤1	131	138
	≥2	2	21
APACHE II	≤6	108	92
	≥7	25	67
MEWS	≤2	133	134
	≥3	0	25

Table 5: The Comparison of the Ankara Poisoning Criteria with Treatment Requirements of Patients

	Ankara criteria		P value
	Negative	Positive	
Length of hospital stay (days)	1	24	11
	≥2	109	148
Need for Mechanical Ventilation	None	133	146
	Yes	0	13
Need for inotropic support	None	132	150
	Yes	1	9
Need for Dialysis	None	133	156
	Yes	0	3
Special Treatment	None	107	102
	Yes	26	57
Antidote	None	133	159
	Yes	0	9

The previously conducted studies focused mostly on the vital signs of the patients^[2,3,7]. The Apache scores of the patients with poisoning hospitalized in the ICU in the studies of both Banderas-Bravo and al and Alizadeh and al. were compared., however, no other patients’ findings were reported about the clinical status of the patients. In our study, patients were assessed in terms of the Ankara Poisoning Criteria, while at the same time it was questioned whether it is possible to predict the need for intensive care treatment of patients by using these criteria^[9,10]. Also in our study, it was found that systems aimed at predicting the severity of intensive care patients are mostly focused on the evaluation of sepsis patients. The clinical use of the poisoning severity score (PSS)^[1,11] which is used in the evaluation of patients with poisoning, has not reached the desired prevalence due to the examination of the large number of parameters.

The most important limitation of our study is that it is done in one center and as the result, it could not be possible to examine some types of poisoning. Since the cases with poisoning vary locally, our developed scoring system needs to be supported by multicenter studies in different geographical regions. The second limitation might be that our patient group relatively consists of more of patients who are not really in need of intensive care. Therefore, we need to carry out different studies and publish the results of these studies using the Ankara Poisoning Criteria in various centers and intensive care units^[12,15].

CONCLUSION

The Ankara Poisoning Criteria, introduced in this study, is an appropriate, simple and practical scoring system that can be used in the decision for the indication of intensive care hospitalization and prognosis prediction in cases with poisoning.

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