



POISONING SEVERITY SCORE AND IT'S ABILITY TO PREDICT OUTCOME IN CASES OF POISONING

Medicine

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ABSTRACT

Background: Poisoning is a huge epidemic of noncommunicable disease in this century. Among the unnatural deaths, deaths owing to poisoning fall next only to road traffic accident deaths. Management of these critically ill patients will largely get better if the general causes of poisoning are properly defined[1] The PSS is a classification scheme for cases of poisoning in adults and children[2]. This scheme should be used for the classification of acute poisonings regardless of the type and number of agents involved. **AIMS AND OBJECTIVES:** To study the clinical and laboratory profile of cases of poisoning in J.A. Group of Hospitals, Gwalior To evaluate the "Poisoning Severity Score (PSS)" and its ability to predict outcome in cases of poisoning. **MATERIAL AND METHODS RESEARCH SETTING -** Data for this study was obtained from indoor wards of Department of Medicine, G.R.MEDICAL COLLEGE & J.A. Group of hospitals Gwalior. The study was scheduled to be completed in a time duration from January 2019 to June 2020. It is a Prospective Descriptive study consisting of total 60 cases of Acute poisoning. Severity score was assessed by the information in case sheets using Poisoning severity scoring (PSS) system. The outcome was measured in terms of morbidity and mortality **RESULT:** Out of 60 cases according to PSS 55% were grade 1 cases, 25% were grade 2 cases, 15% were grade 3 cases and 5 % were grade 4 or death. 39 of patients did not require to be intubated. **CONCLUSIONS:** Poisoning is one of the medical emergencies and causes significant mortality and morbidity. Suicidal intent was significantly higher than other modes of poisoning ($p=0.001$). Organophosphorus compounds are the commonest agents involved in poisoning followed by rat killer poison. Banning or restricting their use may decrease mortality and morbidity from poisoning. In this study, we found that PSS was a very helpful tool in predicting the mortality in patients of poisoning.

KEYWORDS

INTRODUCTION

The word poison means "A Substance That Causes Damage, Morbidity, or Mortality, Particularly by Chemical Manners"[3], or we can say that the word „Poison“ arises from word „poisonem“ which means deadly droughts. Poisoning is a huge epidemic of noncommunicable disease in this century. Among the unnatural deaths, deaths owing to poisoning fall next only to road traffic accident deaths. The prevalence and deaths owing to poisoning in developing countries have been increasing steadily in recent years. The WHO conservatively roughly calculates that the occurrence of pesticide poisoning, which is more in developing countries, has increased twofold during the last 10 years[4]. According to the World Health Organisation (WHO) more than 3 million poisoning cases with 2,51,881 deaths occur worldwide annually of which, 99% of the fatal cases occur in developing countries[4]. Poisoning is the fourth most common cause of death in India and it has been estimated that, five to six persons per lakh of population die due to acute poisoning every year. Management of these critically ill patients will largely get better if the general causes of poisoning are properly defined[1]. Information available in our country is little with regard to acute poisoning in adults, including those hospitalized[5]. It is significant to know the kind and extremity of poisoning in order to take the right preventive measures. In India, poisoning rate varies between 15%- 30% of CFR[6]. Lack of specialized toxicological services in developing countries like India has further contributed to the higher rates of morbidity and mortality[2]. The PSS is a classification scheme for cases of poisoning in adults and children[2]. This scheme should be used for the classification of acute poisonings regardless of the type and number of agents involved. The cornerstone of treatment includes supportive measures, timely gastrointestinal decontamination, extracorporeal methods of elimination of poisons and antidotes[7]. It is therefore important to know the nature and severity of poisoning to take prompt measures in saving life and thereby reduce morbidity and mortality.

MATERIAL AND METHODS

Data for this study was obtained from indoor wards of Department of Medicine, G.R.MEDICAL COLLEGE & J.A. Group of hospitals Gwalior. The study was scheduled to be completed in a time duration from January 2019 to June 2020. It is a Prospective Descriptive study consisting of total 60 cases of Acute poisoning.

INCLUSION CRITERIA- Patients of Age > 18 years Cases of

Acute poisoning

EXCLUSION CRITERIA- Age < 18 years Patient who do not give written consent

Data was collected after obtaining permission from the competent authority and ethical committee. Socio demographic details such as age, sex, occupation, type of poisoning, outcome and other details was collected from the patients' case records, treatment charts, nursing notes, laboratory reports, and discharge summaries.

METHODOLOGY-

Severity score was assessed by the information in case sheets using Poisoning severity scoring (PSS) system. It was used to grade the severity of poisoning and use it for prediction of mortality and morbidity.

Severity Grades:

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 and fatal Death (4)

The data analysis was done to draw the valid references. Statistical analysis of data collection was done by finding mean values, standard deviation, frequency and Chi square test using SPSS version 19.

RESULTS

This is an observational clinical study with 60 cases of poisoning is undertaken to assess the utility of PSS (Poison Severity Score) scoring systems in predicting severity and clinical outcomes in poisoning.

Table 2: Age Distribution Of Patients Studied

AGE IN YEARS	NO. OF PATIENTS	%
18-20	9	15
21-30	27	45
31-40	12	20
41-50	3	5
51-60	6	10
61-70	3	5
TOTAL	60	100

Majority of poisoning occurred in 21-30 age group (n=45), followed by 31-40 age group (n=20), 18-20 (n=15). The youngest patient being 18 yrs and the oldest patient being 67 years.

Table 3: Gender Distribution Of Patients Studied

Gender	No. Of Patients	%
Male	36	60
Female	24	40
Total	60	100

Majority of patients were male (n=36). Number of female patients were 24. Most of the patients coming with op poisoning were males.

Table-4: Agents Of Poisoning

Poisoning compounds	Frequency	Percentage
OP Poisoning	11	18.3
Celphos	9	15
Rat Killer	10	16.7
Hair dye	9	15
Dhatura	1	1.67
Unidentified+ alcohol	3	5
Unidentified substance	18	30
Total	60	100

In this study 18.3% cases are of OP Poisoning, 15% of Celphos Poisoning, 16.7 % of Rat Killer, 15% of hair dye Poisoning, and 35% cases were unidentified .

Table-5: Mode Of Presentation

Clinical feature/ Mode of presentation	Frequency	Percentage
Unconsciousness	4	6.6
Abdominal Pain and burning sensation	1	1.7
Altered Sensorium, Vomiting	1	1.7
Vomiting, Giddiness	10	16.7
Vomiting, Abdominal Pain	1	1.7
Breathlessness, Giddiness	4	6.6
Palpitation	2	3.3
Inability to speak, throat pain	1	1.7
Vomiting , Headache	3	5
Altered sensorium	3	5
Vomiting, breathlessness	2	3.3
Nausea, Giddiness	9	15
Vomiting	15	25
Palpitation, Dizziness	1	1.7
Abdominal pain	1	1.7
Drowsiness, palpitation	1	1.7
Vomiting, Chest Pain	1	1.7
Total	60	100

In this study 25% patients(n=15) presented with vomiting commonly followed by breathlessness(n=4) 6.6% followed by unconsciousness 6.6%(n=4) followed by altered sensorium 5% (n=3) followed by abdominal pain 1.7% (n=1) .15 % in asymptomatic and presenting with giddiness.

Table 6: Distribution According To Poisoning Severity Score On Admission

Grade	PSS on admission
Grade 1	30(50%)
Grade 2	19(31.7%)
Grade 3	9(15%)
Grade 4	2(3.3%)

There were 30 cases (50%) of grade 1 poisoning, 19 cases (31.7%) of grade 2 poisoning, 9 cases (15%) of grade 3 poisoning and 2 cases (3.3%) of grade 4 poisoning on Admission.

Table 7: Distribution According To Poisoning Severity Score 2 Days After Hospitalization

Grade	PSS
Grade 1	33(55%)
Grade 2	15(25%)
Grade 3	9(15%)
Grade 4	3(5%)

There were 33 cases (55%) of grade 1 poisoning, 15 cases (25%) of grade 2 poisoning, 9 cases (15%) of grade 3 poisoning and 3 cases

(5%) of grade 4 poisoning(death within first 24hours).

Table 8: Correlation of PSS with outcome

PSS	Total Patient	Survived without intubation(n=36)	Survived with intubation(n=9)	Death (n=15)	P value
Grade 1	24	24(40%)	0(0%)	0(0%)	0.021
Grade 2	12	9(15%)	0(0%)	3(5%)	0.021
Grade 3	16	3(5%)	9(15%)	6(10%)	0.026
Grade 4	6	0(0%)	0(0%)	6(10%)	0.023

Table 9: Correlation of PSS with Mortality

PSS(Final)	Mortality	Percentage	P value
Grade1	0	0	<0.001
Grade 2	3	3	<0.001
Grade 3	9	6	<0.001
Grade 4	0	6	<0.001

DISCUSSION

In this study, we analysed the data regarding cases of poisoning admitted to our hospital over the period January 2019 to June 2020. In the present study 60 poisoning patients was undertaken to assess the utility of PSS (Poison Severity Score) scoring system in predicting severity and clinical outcomes in poisoning.

Age Distribution

In this study highest number of cases occurred in 21-30 years of age group (45%) followed by 31-40 years of age group (20%). Youngest case is 18-year-old and the oldest was 61 years of age. Incidence of the poisoning was highest in the 21-30 years age group in Vasanthan et al study[8] and Dr Achinta Mandal et al study[9].

Sex Distribution

Higher incidence of poisoning occurred in males (60%) compared to females (40%) and male to female ratio 1.6:1. This is similar to many studies which found a male preponderance[10].

Type Of Poisoning

In this study, among the types of poisoning, most common was organophosphorus poisoning (18.3%). Rat killer was the commonest agent found by Rathore et al.,[11] Vasanthan et al[8] studies, Although other studies from Moradabad conducted by Ravi Gangal found[12], Insecticides & Pesticides to be the most commonly consumed substance and another study conducted in Pakistan found drugs as the common poisoning agent. In our study the second common agent involved in poisoning is rat killer. Similar result also found in narayana Prasad Modi et al., study[13].

Mode Of Presentation

In this study the most common mode of presentation was vomiting (25%) followed by breathlessness (6.6%). The present study was conducted to assess the efficacy of PSS to predict severity and clinical outcome of poisoning. The possible outcomes and risks at different exposure levels were predicted by evaluating clinical effects, poisoning severity, severity of mental injury. Poisoning was the most common form of intentional self-harm.

Poison Severity Score

The poisoning severity score (PSS) is a severity grading scale adopted by the IPCS, the Commission of the European Union, and the European Association of Poison Centers and Clinical Toxicologists (IPCS/EC/EAPCCT) for grading the severity of poisoning. This scale is necessary to facilitate comparability of case data. The PSS was developed, so that valid comparisons regarding severity and outcome could be made among the various poison centers and to take an account of the overall clinical picture. The purpose of the PSS is to provide a simple but relatively robust system for describing the severity of poisoning on the basis of clinical observations. It is not a prognostic score but is instead meant to define the degree of severity when the overall clinical features are most severe. Study done by Casey PB showed that poison severity score recorded at admission can be used to predict outcome of poisoning patients[14]. The present study tried to assess the ability of PSS to predict the final outcome of poisoning patients.

Out of 60 cases 55% were grade 1 cases, 25% were grade 2 cases, 15% were grade 3 cases and 5 % were grade 4 or death. The findings of this study highlight the usefulness of few clinical indices like Poisoning severity scoring systems for predicting severity which in turn can be used to predict outcome of poisoning in patients especially during triage. Identification of severity at an early stage followed by prompt treatment can prevent the late respiratory and cardiac failures associated with poisoning.

CONCLUSIONS

Poisoning is one of the medical emergencies and causes significant mortality and morbidity. Most of the suicidal poisoning cases are seen in the age group between 21 years to 30 years due to their various personal problems. Organophosphorus compounds are the commonest agents involved in poisoning followed by rat killer poison. Organophosphorus compounds were the commonest to be consumed but celphos compounds were responsible for the greatest number of deaths. Banning or restricting their use may decrease mortality and morbidity from poisoning. Poison severity scoring (PSS) systems are effective in predicting severity and outcome of poisoning. In this study, we found that PSS was a very helpful tool in predicting the mortality in patients of poisoning ($p < 0.005$). Hence, PSS may be very helpful in triaging patients. It is easy to use, since it does not require any specific laboratory investigations. PSS is a little time consuming however it can be done easily. It is useful in peripheral areas to identify high risk patients for urgent referral to tertiary care center.

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