

Pattern, Management, and Outcome of Poisoning in a Tertiary Care Hospital

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ABSTRACT:

Introduction: Poisoning is a significant global public health problem. The appropriate management of poisoning at emergency needs accurate assessment and immediate treatment. The immense chance for better outcomes occurs with early diagnosis and treatment. This study was conducted to assess pattern, management, and outcome of poisoning in tertiary care hospital. **Methods:** An observational cross-sectional study was conducted in which records of patients with a diagnosis of poisoning over a period of four years were reviewed. **Results:** A total of 138 patients were included in the study. A majority (63%) of them were females. Most (67.4%) were managed by general or supportive measure only. Gastric lavage was done in 60% of total patients while 52.9% patients received activated charcoal. Pralidoxime and atropine was received by 51.1% of patients treated with specific antidote. All the antidotes were administered through intravenous route. Regarding outcome, 89.9% were completely recovered. Suicidal poisoning was significantly higher in married as compared to unmarried patients ($p = 0.029$). Similarly, there was a significant relationship between occupation of the patients and manner of poisoning ($p = 0.003$). Outcome of treatment had a significant association with the manner of poisoning ($p < 0.001$). Further analysis revealed that the patients who expired in the hospital were more likely to ingest poison accidentally. **Conclusion:** Suicidal poisoning is common and females are more susceptible. Insecticide and rodenticide are the commonly ingested poisons. Treatment outcome of poisoning cases is generally favorable.

Keywords: antidote • insecticide • organophosphorus • poison • suicide

INTRODUCTION:

“Poisoning is a significant global public health problem.”[1] It is one of the important causes of patient admission to emergency department and Intensive Care Units (ICU).[1] According to World Health Organization (WHO) data of 2012, thousands of people died throughout the world from unintentional intake of poisons. The most of deaths

occurred in low and middle income countries.[1] In Nepal, Narcotic Drug Control Act - 2033 (1976) and Pesticide Act - 2048 (1991) prohibit narcotics and pesticides misuse.[2,3] The harmful consequences of poisoning are higher in under developed and developing countries because of presence of weak health regulations and poor healthcare services.[4] Moreover, the holistic management of poisoning includes general or supportive measures, use of specific antidotes, and psychosocial intervention. The appropriate emergency management of poisoning requires accurate assessment and immediate therapy. A better prognosis can be expected with early diagnosis and proper treatment.[5] Only few studies have been done in Nepal to assess pattern and outcome of poisoning management. Hence, this study aims to provide insight into the pattern, management, and outcome of poisoning in a tertiary care hospital of Western Nepal.

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METHODS:

An observational, cross-sectional, and



analytical study was carried out in Lumbini Medical College Teaching Hospital after approval from Institutional Review Committee (IRC-LMC) of the institute. Primary data collection was done from mid-January 2018 to mid-March 2018. During this period, medical records of the study subjects treated in this center from January 2014 to December 2017 were retrieved from medical record section.

The inclusion criteria were:

- Patients with diagnosis of poisoning

The exclusion criteria were:

- Patients with diagnosis of snake bite and insect bite
- Patients with diagnosis of poisoning who were dead on arrival

Demographic data, type and route of poison intake, manner of poisoning, management, and treatment outcome were extracted and recorded from the medical records. Diagnosis of poisoning was made on basis of history of exposure or contact and characteristic features. It was not supported by measurement of plasma poison concentration or specimen analysis since these facilities were not available at our center.

All data were tabulated in Microsoft Excel and then imported into Statistical Package for the Social Science (SPSS), version 16. Descriptive statistics were presented as frequency, percentage, mean, and standard deviation (*SD*). Mean values of continuous variables were compared with *independent t-test*. Categorical variables were compared with *Chi-square test* or *Fisher-exact test* whichever was appropriate. *P* value less than 0.05 was considered as statistical significant.

RESULTS:

Records of 138 patients of poisoning admitted to Emergency and Medicine department were available during the study period. There were 87 (63.0%) female patients and 51 (37.0%) male patients with a F:M ratio of 1.7:1. Assuming almost equal distribution of gender in population, this difference in gender is statistically significant ($X^2 [N=138, df=1] = 9.39, p = 0.002$). Mean age of females was 29.1 years ($SD = 14.4$) and that of males was 29.9 year ($SD = 20.5$). The difference in mean age was not statistically significant ($t = -0.24, df = 136, p = 0.81$). Marital status and occupation of the patients is presented in Table 1.

Type of poison ingested, manner of poisoning, cause of poisoning, and time duration from ingestion

of poison to arrival in the hospital is given in Table 2. Insecticide was the most commonly ingested poison. Among insecticide, 50 (80.6%, $N = 62$) patients ingested organophosphorus poisoning. All the patients ingested poison by oral route. Three-fourth of the cases were suicidal. Familial disharmony was the most common cause of poisoning. Most of the patients landed to emergency ward after one hour of poison ingestion.

Among all the patients, 93 (67.4%) were treated with general or supportive measures while the rest 45 (32.6%) were treated with specific antidote in addition to general measures. Gastric lavage was done in 83 (60%) patients while only 73 (52.9%) received activated charcoal. Pralidoxime and atropine was received by 23 (51.1%, $N = 45$) of patients treated with specific antidote. All the antidotes were administered through intravenous route. Psychiatric consultation was done for all the

Table 1: Marital status and occupation of the patients of poisoning ($N = 138$)

Characteristics	n (%)	
Marital status	Married	79 (57.2)
	Unmarried	59 (42.8)
Occupation	Housewife	51 (37.0)
	Student	48 (34.8)
	Farmer	25 (18.1)
	Business	2 (1.4)
	Job holder	4 (2.9)
	Others	8 (5.8)

Table 2: Circumstances of patient with poisoning ($N = 138$)

Variables	n (%)	
Type of poison ingested	Insecticide	62 (44.9)
	Rodenticide	23 (16.7)
	Mushroom	14 (10.2)
	drug overdose	12 (08.7)
	Corrosive	11 (8)
	Herbal	6 (4.3)
	Fungicide	2 (1.4)
	Unknown	8 (5.8)
Manner of poisoning	Suicidal	104 (75.4)
	Accidental	34 (24.6)
Cause of poisoning	Familial disharmony	81 (58.7)
	Mental disorder	10 (7.2)
	Other	47 (34.1)
Time of hospital arrival	Within one hour	5 (3.6)
	After one hour	133 (96.4)

patients who were not in ventilator, during their hospital stay.

Most of the patients ($n = 124$, 89.8%) completely recovered and were discharged from the hospital while seven (5.1%) expired at hospital and other seven (5.1%) left against medical advice. Among those who expired, five patients had consumed poisonous mushroom, one had consumed organophosphorus poison, and in the other one case the poison was not identified.

Table 3 shows the association between manner of poisoning and other variables. Suicidal poisoning was significantly higher in married as compared to unmarried patients ($p = 0.029$). Similarly, there was a significant relationship between occupation of the patients and manner of poisoning ($p = 0.003$). On further analysis with Bonferroni correction, the significance was only with the "others" category. Outcome of treatment had a significant association with the manner of poisoning ($p < 0.001$). Further analysis revealed that the patients who expired in the hospital were more likely to ingest poison accidentally.

Table 3: Association between manner of poisoning and other variables ($N = 138$)

Variables		Suicidal, <i>n</i> (%)	Accidental, <i>n</i> (%)	Statistics
Marital status	Married	65 (82.3)	14 (17.7)	$X^2 = 4.76$, $df = 1$, $p = 0.03$
	Unmarried	39 (66.1)	20 (33.9)	
Occupation	Housewife	41 (80.4)	10 (19.6)	$p = 0.003^*$
	Student	37 (77.1)	11 (22.9)	
	Farmer	21 (84.0)	4 (16.0)	
	Job holder	3 (75.0)	1 (25.0)	
	Other	2 (20.0)	8 (80.0) [#]	
Outcome	Completely recovered	99 (79.8)	25 (20.2)	$p < 0.001^*$
	Expired at hospital	1 (14.3)	6 (85.7) [#]	
	LAMA	4 (57.1)	3 (42.9)	

* Fisher-Exact test; # statistically significant; LAMA – left against medical advice

DISCUSSION:

In this study, we aimed to assess management pattern and outcome of poisoning. There are numbers of aspect on which outcome of poisoning treatment depend on such as type of poison consumed, dose of poison, availability of healthcare services, time interval between poison ingestion and treatment initiation, and appropriate measures use for the treatment.[1] The result of outcome can improve if patients are brought immediately to the hospital and

appropriate management is done.

The result of our study showed that poisoning was more common in female as compared to that in male. This finding is supported by other studies done in different countries.[4,5,6] This might be due to increase burden of factors among female that contribute to commit suicide in male dominant society in underdeveloped countries. The factors could be depression, mental torture, and familial disharmony due to extramarital affairs of husband and infertility. While in some studies either there was equal distribution of poisoning among gender or poisoning was common in male.[7,8,9,10] Likewise, in our study insecticide poisoning was common which was supported by other studies.[11,12,13] This result might be due to the easy availability of insecticides in the market in our agriculture based countries. Also, improper storage of chemicals at home can make easy approach toward them during impulsive act of poisoning. Contrary to finding of our result, some studies showed that drug and household cleansing agents were common form of poisoning.[5,6,7,8]

Majority of the patients in our study were managed by general or supportive measures. Specific antidotes were administered in about one-third of the patients. The proper treatment with antidote may remarkably neutralize the toxic action of the poison and increase its elimination. Our findings were similar to other studies conducted.[12,14,15] Atropine and pralidoxime were commonly administered by parenteral routes in those studies as about one-third of patients among insecticide poisoning consumed organophosphorus compound. Hence, atropine competitively antagonizes muscarinic effects of those compounds and pralidoxime reactivates cholinesterase enzyme. Additionally, psychological consultations were also done in most of the suicidal cases. Suicidal ideation and behaviors are important markers for suicidal attempts. They are associated with many risk factors like financial loss and sense of isolation from society. Also, major depression is a significant psychiatric disorder which is associated with suicidal attempts in all age group. Thus, psychological evaluation is necessary in all cases of suicidal attempts so that the patient can be treated accordingly and future repeated suicidal attempts can be prevented. Moreover, the present study demonstrated that most of the patients improved after treatment and mortality was low. Other studies also agreed with our findings where total mortality was low.[15,16,17,18] The mortality in such patients might be due to various factors like delay in arrival

to hospital and lack of information related to type and dose of poison consumed.

The noticeable point of our study is that the majority of patient admitted improved after appropriate management despite delay in arrival to the hospital. Most of the patients were brought to the hospital only after one hour of poison ingestion. The reason behind this can be high quality of healthcare providers and healthcare facility, ingestion of low dose of poison just to threaten the family members, early discovery of ingestion of poison by family members or friends. A mixed quantitative-qualitative type of study would have answered the question.

A limitation of our study is that the diagnosis of patient was solely done on the basis of history of exposure to substance and clinical examination. We do not have the facility to ascertain type and concentration of poison in blood or specimen throughout the country for routine use. Retrospective observation of records and small sample are other limitations that might have deviated of result from the actual scenario. We feel that there is a need for studies that aim to find out the causes of suicidal poisoning in the society. Educational programs that emphasis on proper usage and storage of insecticides at home, in our agriculture based country, would

reduce accidental poisoning incidents. Additionally, there is also need to focus on measures required for transportation of patients to hospital so that the delay between poison consumption and hospital arrival could be minimized.

CONCLUSION:

Poisoning is common in our society. Suicidal poisoning is more common and it is more prevalent among females. Insecticide and rodenticide are the commonly ingested poisons. Treatment outcome of poisoning is satisfactory with low mortality.

ADDITIONAL INFO:

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Conflict of interest:

The authors declare that no competing interest exists.

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