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Patterns and Outcome of Poisoning Case Admitted in ICU of Provincial Hospital of Bagmati Nepal

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ABSTRACT

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Introduction: Poisoning is a serious public health issue that can be caused by numerous chemical and pharmacological substances. It is one of the causes of patient admission in Intensive Care Unit. Poisoning has a harmful effect due to exposure to a foreign chemical. A proper assessment, appropriate management and immediate treatment in intensive care unit is necessary for better outcome.

Objectives: To describe the patterns of admission and outcome of poisoning case admitted in Intensive Care Unit of Provincial Hospital of Bagmati Nepal.

Methods: A retrospective cross-sectional study was conducted and data from November 2022 to November 2023 was collected from the Intensive Care Unit logbook record and chart .

Results: Total of 77 patients were admitted with poisoning during 12 months of study period. The mean age of the patients is 32 ± 19 years. Most common age group of poisoning was between 16-45 years. Most of the patient admitted in Intensive Care Unit with diagnosis of poisoning were married 52 (67.5%). Insecticide (55.8%) was the most commonly ingested poison. Most of the cases were suicidal attempts due to family disharmony. Most of the patients 55 (71.4%) completely recovered and discharged while 6 (7.8%) expired at hospital and 2 (2.6%) patients were referred to higher center for further management.

Conclusion: The majority of poisoning cases included females between the ages of 16 and 45 who were married and had attempted suicide as a result of family trouble. The most often consumed toxin was insecticide (55.8%) and organophosphorus compound is the most common insecticides used.

Key words: Clinical outcome; epidemiological profile; intensive care unit; mortality; poisoning.

INTRODUCTION

Poisoning is a serious worldwide public health issue that can be caused by a wide range of chemical and pharmacological substances in various combinations and accounts for 90% of the burden of fatal poisoning cases in developing countries.[1, 2] The severity and outcome of poisoning are influenced by a number of factors such as chemical and physical properties of the poison, quantity consumed, mode of poisoning and individual characteristics like functional status of organ, age and pre-existing disease.[3,4] Poisoning is a major cause of morbidity and mortality in developing countries.[5] With accurate assessment, appropriate management and immediate treatment in intensive care unit, there is an immense chance for better outcomes.[1]

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In Nepal, there is no well-organized poison control center, routine screening, and confirmatory tests and also, we have a limitation of epidemiological data on acute poisoning and treatment outcomes of its clinical management in the ICU at the hospital level. With the progress in the agricultural and industrial field and advances in medical sciences, a vast number of insecticides have become available, which on exposure may produce severe toxicity. In general, accidental poisoning is more common in children, whereas suicidal poisoning is more common in young adults.[6] This type of studies will be a useful in planning and management of critically ill acute poisoning cases. Hence, the purpose of this study is to shed light on the pattern, frequency and outcome of poisoning at ICU setting of the peripheral hospital.

METHODS

Intensive care unit (ICU) of Madan Bhandari Academy of Health Sciences was established on 2020 A.D and is of 7 bed capacity unit with 7 invasive hemodynamic monitors, 7 mechanical ventilators, two ABG machine, one Defibrillator and USG machine. The unit provides level II basic ICU

services which includes mechanical ventilation for longer than 24 h and specific organ support such as continuous vasopressor infusion. This ICU is open ICU system run under department of Anesthesia.

This study was a retrospective cross-sectional analysis conducted at the ICU of Provincial Hospital of Bagmati Nepal. The data were collected over a one-year period, from November 2022 to November 2023. All patients consecutively admitted to the ICU with a diagnosis of poisoning during this time frame were included in the study, yielding a total sample size of 77 patients. Convenience sampling was employed by reviewing ICU logbooks and medical charts.

Patients were included if they had a confirmed diagnosis of poisoning and were admitted to the ICU within the specified study period. Charts with incomplete data or missing documentation were excluded from the analysis. Ethical approval for the study was obtained from the Institutional Review Committee (IRC), Madan Bhandari Academy of Health Science.

Data were collected using a structured checklist and included variables such as socio-demographic details, type and cause of poisoning, mode of ingestion, clinical interventions, length of ICU stay, and clinical outcomes. The collected data were entered and analyzed using Microsoft Excel and IBM SPSS version 20. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to present the findings.

RESULT

A total of 77 patients were admitted from 2022 November to 2023 November with diagnosis of poisoning. There were 27 males and 50 females with the male female ratio of 1:1.8. The age of the patients varied from 11 to 83 years with mean age of 32 ± 19 years. Most common age group of poisoning was between 16-45 years which accounts for 47 (61%) patients, whereas lest common was more than 80 years accounting for only 2 (2.6%) patients. 44.15% of the female patients were from 16 to 25 years age group Similarly, 16.88% of the male patients were from 16 to 25 years age group. In less than 15 years and 45-79 years of age, there were equal number of patients that is 5 and 9 in both male and female. Most of the patient admitted in ICU with diagnosis of poisoning were married 52 (67.5%). Out of 77 patient 65 (84.4%) patient were admitted in ICU on emergency basis whereas 12 (15.6%) patients were admitted in ICU electively for observation only (Table 1, Figure 1). Maximum number of patient (9) was admitted in ICU on August 2023 whereas least number (3) of admission was on March 2023.

Table 1: Socio Demographic Characteristics.

Characters		Frequency	Percentage
Age (years)	≤15	10	13%
	16-45	47	61%
	46-79	18	23%
	≥80	2	2.6%
Sex	Male	27	35.1%
	Female	50	64.9%
Marital Status	Married	52	67.5%
	Unmarried	25	32.5%
Type of Admission	Emergency	65	84.4%
	Elective	12	15.6%

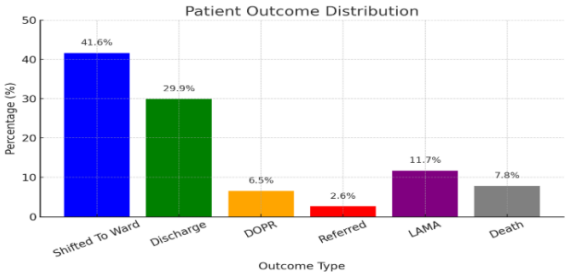

Figure 1: Outcome of patient with poisoning.

Type of poison ingested, manner of poisoning and cause of poisoning were evaluated. Insecticide (55.8%) was the most commonly ingested poison followed by Chemical (13%), Rodenticides (11.7%), unknown poisoning (10.4%), drugs (5.2%) and others (Datura, silicon, carbon monoxide) (3.9%). Ibuprofen with Paracetamol combination and Naproxen were the most common analgesic used. Among insecticide, all patients ingested organophosphorus poisoning. All the patients ingested poison by oral route except one which was inhalation. 68 (88.3%) cases were suicidal and 9 (11.7%) cases were accidental. The main cause of poisoning was family disharmony 47 (61%). (Table 2)

Table 2: Circumstances of patient with poisoning.

Variables		Frequency	Percentage
Type of Poisoning	Insecticides And Pesticides	43	55.8%
	Rodenticide	9	11.7%
	Chemical	10	13%
	Drugs	4	5.2%
	Others	3	3.9%
	Unknown	8	10.4%
Cause of Poisoning	Family Disharmony	47	61%
	Mental Disorder	7	9.1%

	Others	23	29.9%
Mode of Poisoning	Oral	76	98.7%
	Inhalational	1	1.3%
Manner of Ingestion	Suicidal	68	88.3%
	Accidental	9	11.7%

Among all the patients, 39 (50 %) were treated with general or supportive measures while the rest 38(49.93%) were treated with specific antidote in addition to general measures. Gastric lavage was done in 56 (72.72%) patients. Pralidoxime and atropine was received by 38 (49.93%) patients which is a specific antidote for OP poisoning. All the antidotes were administered through intravenous route. Psychiatric consultation was done for all the patients who were not in ventilator, during their hospital stay.

Most of the patients 55 (71.4%) completely recovered out of which 32 (41.6%) patients were shifted to ward and 23 (29.9%) patients were discharged directly from ICU while 6 (7.8%) expired at hospital, 9 (11.7%) left against medical advice, 5 (6.5%) patients were discharged on patient request and 2 (2.6%) patients were referred to higher center for further management (Figure 3). During the course of treatment 7 patient needed mechanical ventilation support among which 6 patients had OP poisoning and one patient was diagnosed with phenyl poisoning. Among those who expired, five patients had consumed organophosphorus, one had consumed chemical that is phenyl. Most of the patient were married and the main cause of intake of poison was family disharmony. Further analysis revealed that the patients who had expired were more likely to ingest poison with suicidal attempt.

DISCUSSIONS

Poisoning is one of the leading causes of morbidity and mortality in Nepal and also a major public health problem.[5] World Health Organization (WHO), 2025 data estimated that more than 720,000 people die due to suicide every year globally which made suicide a major cause of premature mortality across the world.[7] The prompt diagnosis and appropriate management is necessary for better outcome in poisoning cases. However, the clinical outcome of patients admitted to the ICU is determined by their clinical condition at the time of admission, socioeconomic status, and presence of various comorbid conditions, the level of experience and training of the staff, the ICU's resources, infrastructure, and capacity.[2,8] During the study period of 1 year, a total of 77 poisoning cases were admitted to ICU of Hetauda hospital. Out of these, maximum number of cases were due to pesticides – 43 cases (55.8%) (Figure 2, Table 2). This result is similar to the study done by Bannur et al on 2019 with 49% [9] and a study at Annapoorna Medical College and Hospitals, Salem, Tamil Nadu with 58.66%.[10] 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.[11,12] This might be due to increase burden of factors among female that contribute to commit suicide in male dominant society in developing countries.

The mean age of presentation in the present study was comparable to the study done by Rajbanshi et al. where majority of the patients with acute poisoning presented within the age group of 16–45 years (Figure1, Table 1).[13] We found that the oral route was the most common route of poisoning and suicidal intention the most common mode of poisoning which were also observed by Ahuja et al. and Omid Mehrpour et al[8,14]

Most of the patients (78%) had complete recovery, 2.6% were referred to higher center for further management, 11.7% left against medical advice and mortalaity was low 7.8%. (Figure 1).Similar mortality rate was observed from Bir Hospital and NMC Teaching Hospital.[15] In a similar study done by Gyenwali et al in Chitwan (Nepal), 87.3% of the total patients survived the acute poisoning, and were discharged.[16] In a similar study conducted by Sharma R et al in North India, the mortality rate of acute poisoning was 8.31%, which was similar to our study.[17]

In our study, the majority of patient admitted improved after appropriate management despite delay in arrival to the hospital. The reason behind this can be high quality of healthcare providers and healthcare facilities, ingestion of low dose of poison just to threaten the family members.A limitation of our study is that the diagnosis of patients 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 in our setup. Retrospective observation of records and small sample are other limitations that might have deviated of result from the actual scenario.

CONCLUSIONS

Poisoning is common in our society. Suicidal poisoning is more common and it is more prevalent among females. Among suicidal cases, family conflict was main reason for

consumption of poison. Insecticides are the commonly ingested poisons. This shows that poisoning is more of a mental issue to manage and preventive strategies should be formulated accordingly. Furthermore, the establishment of poison information centers and dedicated toxicological units in hospitals is highly recommended to enhance early diagnosis, streamline treatment, and improve patient outcomes.

Conflict of Interest: None

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