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Original Research Article

A Hospital Based Observational Study Assessing Treatment Outcome Trends of Acute Poisoning Cases

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Abstract:

Aim: The aim of the present study was to estimate the incidence, nature, severity and treatment outcome trends of acute poisoning in a tertiary care hospital in eastern India.

Material & Methods: A prospective study was conducted in the Department of FMT including 1000 patients admitted to the hospital with a clinical diagnosis of any acute poisoning with drugs or chemicals, snakebite, and scorpion sting were the study participants irrespective of age and sex. The recruitment period was 24 months.

Results: Majority of the poisoned patients were females with 55% and males were 45%. Maximum number of poisoned patients belonged to the age group of 21 to 30 years with 38% and the least age group was 71 to 80 years group with only 0.2%. Majority of the poisoning had been due to organophosphorus with 46% followed by house hold cleaning agents like phenyl, acid with 18% and the least type of poisoning was scorpion bites with 0.20%. Major reason for poisoning was Intentional or suicidal with 72%, followed by accidental with 16%, overdose was the reason in 8% and the least reason was criminal with 4%. Majority of the patients had recovered with 70% and 30% of the poisoned patients died despite best treatment provided which was mostly due to delay in bringing the patients to the hospital and police clearance.

Conclusion: Knowledge of the sources of poisoning would be useful for treatment and avoidance. Enhanced public and health providers awareness of regional triggers of poisoning and preventive approaches can significantly minimize acute poisoning morbidity and mortality.

Keywords: Corrosive, India, Pesticide, Poisoning, Snakebite.

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Introduction

Death due to poisoning has been known since time immemorial. Poisoning is a major problem all over the world, although its type and the associated morbidity and mortality vary from country to country. According to the legal system of our country, all poisoning death cases are recorded as unnatural death and a medico-legal autopsy is routine. Toxicology is defi ned as the study of the effects of chemical agents on biological materials. Modern toxicology is a multidisciplinary science and forensic toxicology is required to determine any exogenous chemical agent present in biological specimens made available in connection with medico-legal investigations. [1]

Acute poisoning is one of the most critical medical conditions with severe morbidity and mortality. The primary cause for the poisoning is intentional self-harm and secondary is unintentional or accidental poisoning observed mostly in Farmers and children endured unintended and workplace pesticides or Chemical reactions that contribute to severe or persistent poisoning. The nature of poisons used varies in different parts of the world and may vary even in different parts of the same region depending on the cultural diversity and socioeconomic factors. [2] Poisoning is a significant global public health problem with 90% of the burden of fatal poisoning coming from developing countries. The WHO 2021 data addendum estimates that 2 million lives and 53 million disability-adjusted life-years were lost in 2019 due to exposures to selected chemicals. [3] The World Health Organization (WHO) estimates about one million deaths worldwide are induced annually by suicides and toxic agents and pesticides. [4,5]

Throughout Asian countries, agricultural pesticides like organophosphorus, organochloride, zinc and aluminum phosphide are widely used deliberately or inadvertently because of their easily accessible availability, while in developed and industrialized countries addiction is generally seen for medications like paracetamol, morphine, benzodiazepines and tranquilizers. The Data

records of National Crime Records bureau of India, last updated for 2016 records has shown that 34,869 patients died due to poisoning out of which majority were male compared to female with a ratio of 2 : 1. [6] In many countries, poisoning is one of the main causes of emergency attendance at hospitals. Poisoning is a time-dependent emergency and, like infectious diseases, may require a specialist for appropriate diagnosis and treatment. [7]

Management of these sick patients will greatly improve if the common causes of poisoning are properly defined. Insecticide self-poisoning accounts for about one - third of the world's suicide. In general, and accidental poisoning is more common in children, whereas suicidal poisoning is more common in adults. [8] It is very important to know the nature and severity of poisoning in order to take appropriate preventive and treatment measures. [9]

We, therefore, undertook a descriptive longitudinal observational study to estimate the incidence, nature, severity, and treatment outcome trends associated with acute poisoning, including drug overdose and venomous snakebites, in a tertiary care teaching hospital of Bihar

Material & Methods

A prospective study was conducted in the Department of FMT, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India including 1000 patients admitted to the hospital with a clinical diagnosis of any acute poisoning with drugs or chemicals, snakebite, and scorpion sting were the study participants irrespective of age and sex. The recruitment period was 24 months.

Exclusion Criteria

- Cases of food poisoning, dog or other animal bites, and chronic drug or chemical poisoning (e.g., arsenicosis) were excluded.
- Those unwilling to provide written informed consent were also excluded.

Methodology

Observations were carried out either in the emergency department itself or subsequently in the wards where they were admitted. Baseline demographic and clinical data of each participant were collected, and they were followed up till discharge or death. Medical records of the participants were scrutinized, and caregivers were interviewed where required. Information was collected on the following parameters: age, sex, occupation, family structure, past medical history, type of poison, route of exposure, time lag between poisoning event and hospital admission, events occurring in the interim period, potential nature of poisoning (accidental, suicidal, and homicidal), and circumstances leading to the event. Data on treatment offered, duration of hospitalization, mortality, and morbidity outcome (such as ventilatory support, dialysis, and complications) were collected and analyzed. The incidence of acute poisoning among all emergency hospital admissions was calculated.

Statistical Analysis: Data analysis was done using GraphPad Prism version 6.01 (La Jolla, California: GraphPad Software Inc., 2012) software. In addition to descriptive statistics, subgroup comparisons were done and associations between categorical predictors were explored. Unpaired t-test, Fisher's exact test, or Pearson's Chi-square test as appropriate was used for inferential statistics. Odds ratios (ORs) with its 95% confidence intervals (CI) have been calculated as an estimate of risk of mortality for categorical predictors.

Results

Table 1: Distribution of poisoning patients according to age and gender

Age in years	Gender				Total N (%)
	Male N	%	Female N	%	
1 – 10	4	0.40%	4	0.40%	8 (0.80)
11 - 20	16	1.64%	44	4.44%	60 (6)
21 - 30	175	17.5%	205	20.5%	380 (38)
31 - 40	140	14%	140	14%	280 (28)
41 - 50	70	7%	90	9%	160 (18)
51 - 60	30	3%	60	6%	90 (9)
61 - 70	13	1.30%	7	0.70%	20 (2)
71 - 80	2	0.2	0	0%	2 (0.2)
Total	450	45	550	55	1000 (100)

Majority of the poisoned patients were females with 55% and males were 45%. Maximum number of poisoned patients belonged to the age group of 21 to 30 years with 38% and the least age group was 71 to 80 years group with only 0.2%.

Table 2: Type of poisoning

Type of poisoning	N	%
Snake bite	28	2.80
Organophosphorus / Fertilizers	480	46
Scorpion bites	2	0.20
Unknown pills	17	1.70
Hair dye	30	3
Corrosive Substance	70	7
Kerosene Ingestion	2	2
Alcohol Intoxication	35	3.50
Rodenticide	62	6.20
Household cleaning agents	180	18
Overdose	94	9.4

Majority of the poisoning had been due to organophosphorus with 46% followed by house hold cleaning agents like phenyl, acid with 18% and the least type of poisoning was scorpion bites with 0.20%.

Table 3: Reason for Poisoning

Reason for Poisoning	N	%
Intentional/Suicidal	720	72
Accidental	160	16
Overdose	80	8
Criminal	40	4

Major reason for poisoning was Intentional or suicidal with 72%, followed by accidental with 16%, overdose was the reason in 8% and the least reason was criminal with 4%.

Table 4: Condition of patients

Condition	N	%
Recovery	700	70
Dead	300	30

Majority of the patients had recovered with 70% and 30% of the poisoned patients died despite best treatment provided which was mostly due to delay in bringing the patients to the hospital and police clearance.

Discussion

Acute poisoning is an increasingly growing concern in developed countries during the last few years. The occurrence of acute poisoning in the religious, economic, and geographical contexts differs, and is diverse due to continuous development and the various elements accessible. Use of freely accessible prescription drugs is the most frequent source of acute poisoning in developing countries and also Insecticides are the most commonly used in developing nations An approximate half a million people die per year from pesticide poisoning such as India. [10,11] The World Health Organization (WHO) estimates about one million deaths worldwide are induced annually by suicides and toxic agents and pesticides. [12,13]

Majority of the poisoned patients were females with 55% and males were 45%. Maximum number of poisoned patients belonged to the age group of 21 to 30 years with 38% and the least age group was 71 to 80 years group with only 0.2%. Majority of the poisoning had been due to organophosphorus with 46% followed by house hold cleaning agents like phenyl, acid with 18% and the least type of poisoning was scorpion bites with 0.20%. Many studies with various authors also reported similar findings as fertilizers being major cause of poisoning. [14-17] Major reason for poisoning was Intentional or suicidal with 72%, followed by accidental with 16%, overdose was the reason in 8% and the least reason was criminal with 4%. A study reported from Kathmandu showed that 97% of the poisoning cases admitted in a hospital were due to suicidal attempt and study did not include snake bite cases as our study. [18] In contrast, another study done at Delhi reported that nearly half (47%) of poisoning were accidental (1-70 age group). [19]

Majority of the patients had recovered with 70% and 30% of the poisoned patients died despite best treatment provided which was mostly due to delay in bringing the patients to the hospital and police clearance. The majority of the patients recovered with proper care and treatment. The patients who died of poisoning even despite best efforts were mostly due to delay in bringing patient to the hospital after consuming poison reducing chances of survival. Overdose of drugs is also major cause of poisoning found in our study as pharmaceutical drugs are commercially available without prescriptions and medical store owners despite clear instructions not to sell any drugs without

doctor's prescription, they indulge in such malpractice as many people in order to avoid fees at doctor's office still take advise of medical stores for drugs for pain, fever, cough, cold etc. which they take at their whims and fancies leading to poisoning and also homeopathy, ayurvedic drugs made from home remedies and sold commonly without any research or trials as people in India tend to believe in such magical cures is also seen as a potential poisoning source with few people turned up for lead and arsenic poisoning due to these drugs, as Cases of arsenic and lead poisoning of improperly formulated treatments marketed in India have been recorded.

Conclusion

Knowledge of the sources of poisoning would be useful for treatment and avoidance. Enhanced public and health providers awareness of regional triggers of poisoning and preventive approaches can significantly minimize acute poisoning morbidity and mortality.

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