



Research Article

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Incidence and Outcome of Acute Poisoning Cases in a Medical College Hospital in Jharkhand

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Abstract

Background: Poison is one of the most common reason for admission to an emergency department with half a million death each year attributed to it. Hazaribagh owing to its open fields, and agriculture being the primary source of employment, has its local population exposed to a variety of poisonous agents, both chemical and environmental. **Aims and Objective:** The purpose of our study is to determine the epidemiology and outcome of the poisoning cases being admitted to our hospital. **Study Design:** This is a retrospective/prospective observational study over a period of 1 year from July, 2019 to June 2020. **Setting:** Department of General Medicine, Hazaribagh Medical College and Hospital, Jharkhand. **Material and Method:** A total of 1318 patients meeting the inclusion criteria were studied. Data was collected by direct interview and the reviewing of case records and entered in a proforma which was later analysed. **Result:** Our cohort comprised of 37.2% males and 62.7% females with female: male ratio of 1.7:1. The majority were females between the ages of 21-30 years. Upon questioning, 63.5% had consumed poison intentionally versus only a 36.5% who were accidentally exposed. Among those with intentional poisoning, 69.1% were females. The incidence of accidental poison exposure on the other hand was similar for both genders 51.5% v/s 49.5%. Maximum incidence was seen in rainy season in the months of June, July and August with 32.9% and least number of cases was reported in the summer months between March and May. The incidence of accidental poisoning was maximum during the rainy season, predominantly owing to higher incidences of snake bite during these months. Ingestion was the predominant mode of poisoning with 64.5% followed by animal bites and stings. Predominant household or agricultural poison was noted to be pesticides and that among environmental agents was found to be snake bite. Among drugs and plants ingestions, sleeping pills and wild mushroom were most commonly seen. The average duration of hospital stay for cases admitted with poisoning was 2.13±1.2 days. 62.8% patients were treated successfully and discharged, 25.5% left against medical advice, 10.2% were referred due to complications and 1.5% died. Among those who died 18 out of 20 had intentionally consumed pesticides and were all females. **Conclusion:** Intentional poisoning in the form of para suicide comprised the majority of our cohort closely followed by snake bites, both which were favoured by the geographical location of the study centre. A comprehensive approach targeting the problem at grass root level can lead to decreased in the incidence of such poisoning cases and also reduced the incurred burden on the health care system.

Keywords: Poisoning, Snake bite, Jharkhand, Pesticide.

INTRODUCTION

Poison is a substance that causes damage or injury to the body and endangers one's life due to its exposure by means of ingestion, inhalation, or contact [1]. It is also one of the most common reasons for admission to an emergency department. The massive expansion in the availability and use of chemicals, including pharmaceuticals in past few decades has led to increasing awareness of the risks to human health posed by their exposure. The global incidence of poisoning is unknown, but it is estimated that up to half a million people die each year as a result of various kinds of poisoning, including exposure to natural toxins [2].

Hazaribagh is a city and a municipal corporation in the state of Jharkhand and is famous for Hazaribagh Wildlife Sanctuary and the tribal traditions associated. The city was originally a thick forest and is still surrounded by dense vegetation, which is currently been used as agricultural lands by the local population. The open fields, and agriculture being the primary source of employment, the local population is exposed to a variety of poisonous agents, both chemical and environmental, accounting for a large number of emergency room admissions.

The purpose of our study is to determine the epidemiology and outcome of the poisoning cases being admitted to our hospital. The resulting evaluation is key to formulating a plan for management to reduce morbidity and also to educate the local population of the prevailing poisons and measures to be taken to protect oneself.

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MATERIAL AND METHOD

This is a retrospective/prospective observational study over a period of 1 year from July, 2019 to June 2020. All patients admitted with alleged history of poisoning, bites and stings admitted to the department of General Medicine and hospitalized for at least 24 hours constituted the target of this study (n=1318). The study was conducted after obtaining proper permission from respective authorities. Data was collected by direct interview of patient and their attendant and recorded in a proforma. Details of treatment, hospital course and outcome was obtained using case files of the respective patients. The key information included in the structured format are age, sex, name/type of poisoning agent, reason and route of exposure, duration of hospital stay and outcome of the treatment. These case proforma data were finally analysed using descriptive statistics.

Statistical Analysis

Statistical testing has been conducted with the statistical package for the social science software version SPSS 20.0. Continuous variables were presented as mean \pm SD. Categorical variables were expressed as frequencies and percentages.

RESULT

During the study period a total of 1318 patients meeting the inclusion criteria were admitted. 491(37.3%) were males and 827(62.7%) were females with a female: male of 1.7:1. The age and gender distribution is depicted in graph 1 below. As seen, the majority of cases are comprised of females between the ages of 21-30 years. 837(63.5%) cases had consumed the poison intentionally and the remaining 481(36.5%) were accidentally exposed. Among those with intentional poison ingestion, there was a female preponderance with 579(69.1%) and remaining 258(30.9%) being males. The incidence of accidental poison exposure on the other hand were similar for both genders with 248(51.5%) being females and the rest 233(48.5%) being males.

Maximum incidence was seen in rainy season in the months of June, July and August with 434(32.9%), followed by 370(28%) in autumn in the months of September to November. 282(21.4%) and 232 (17.7%) cases presented in winter (December to February) and summer (March to May) respectively. Graph 2 represents the seasonal incidence of accidental and intentional poisoning cases. As noted, the incidence of both accidental and intentional poisoning cases are lowest in the summer months, but that of accidental is maximum during the rainy season, predominantly owing to higher incidences of snake bite during these months.

Ingestion was the predominant route of poisoning in our cohort with 850(64.5%) cases, 446(33.9%) cases had animal bites and 22(1.6%) were stung. Upon analysing the poisoning agents, household and agricultural agents including pesticides comprised the majority with 825(62.5%) cases. 470(35.7%), 6(0.5%), 13(0.9%) and 4(0.4%) cases were classified as animal bites or stings, drug and wild plant ingestion and unknown poisons respectively. Graph 3 and Graph 4 respectively shows the various agents among household and environmental agents encountered in our study. Other substances commonly ingested were mainly sleeping pills and wild mushroom.

The average duration of hospital stay for cases admitted with poisoning was 2.13 ± 1.2 days. 827(62.8%) patients were treated successfully and discharged, 337(25.5%) left against medical advice, 134(10.2%) cases were referred to Rajendra Institute of Medical Sciences, Ranchi due to complications and lack of available necessary treatment modalities at our setup and 20(1.5%) died. Among those who died 18 had intentional consumption of pesticides and all were females. Among the 2 remaining, 1 was affected by accidental ingestion of unknown poison and the other succumbed to snake bite.

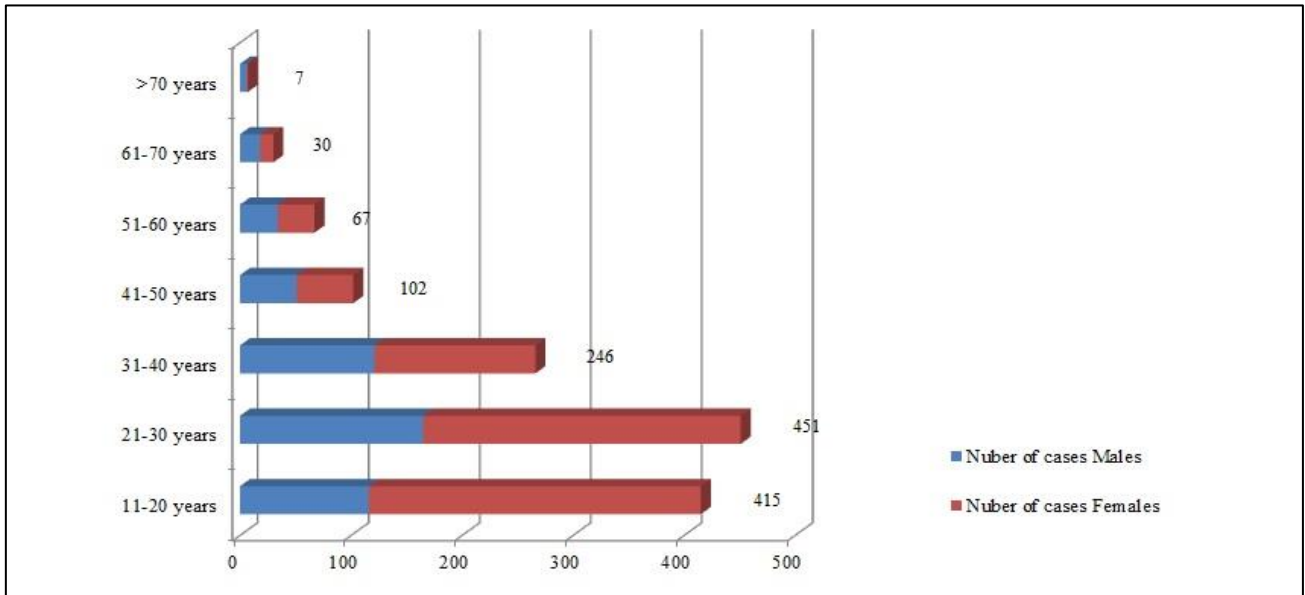
DISCUSSION

The Incidence of intentional and accidental poisoning in our study was similar to another study from southern India with 63.5% v/s 68% for intentional poisoning and 36.5% v/s 31.6% for accidental exposure [3]. Srihari et al from Chennai documented up to 85.8% patients presenting to emergency with alleged history of poisoning to have intentionally consumed it.^[4] Considering the demographics, maximum proportion of cases in our study aged between 21- 30 years was also similar to past studies.^[5] We also noted a higher incidence among females which was contradicting to previous studies from various parts of the country where higher incidence among males were noted [6-9].¹

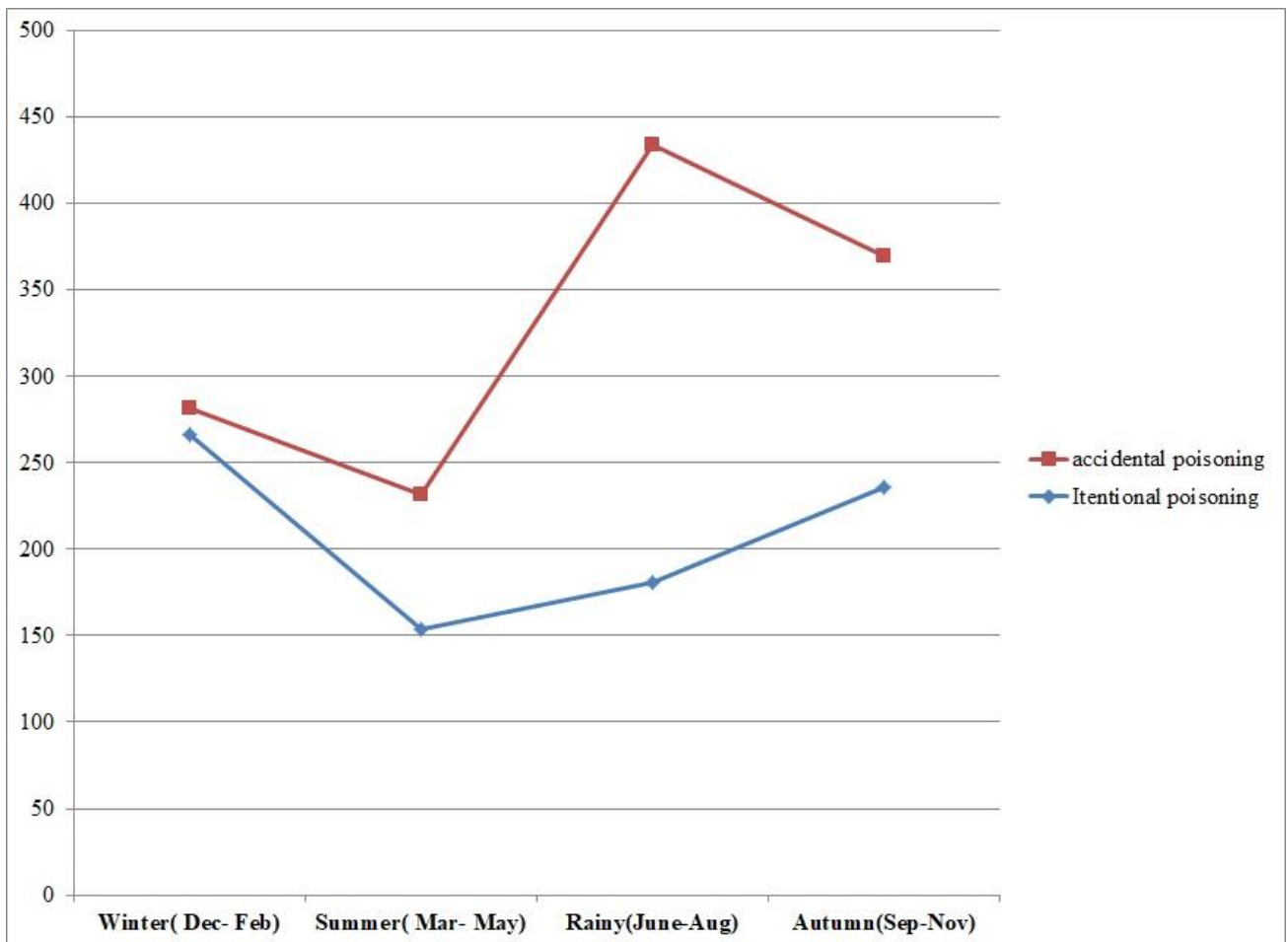
Peak incidence of poisoning cases was in monsoon season between June to August, which was similar to a study by Chittamanchi *et al.* [10] Considering the agent of poisoning, we noted pesticides most commonly implicated, which was different from various other studies from eastern India where snake bite comprised the majority of the cases. [11] WHO in 2016 estimates 5 million snake-bites occur each year, resulting in up to 2.5 million envenoming, at least 100,000 deaths and around three times as many amputations and other permanent disabilities [12]. Jayawardane *et al* from Sri Lanka observed medicinal pills to be the most commonly substance ingested for intentional poisoning, which was contradicting to our study where pesticides were commonly implicated. [13] Other studies from Sri Lanka and India found pesticides to be the most commonly abused substance for intentional poisoning. [14, 15] Study comparing the trends in South East Asian countries has found tremendous rise in pesticide poisoning cases due to its easy availability for crop protection. [16]

We documented a shorter hospital course (2.13 days v/s 12.53 days) and a lower mortality (1.5% v/s 8.31%) in comparison to various studies from different parts of the country. [7, 17, 18] Shorter hospital course could be attributed to early referral of complicated course as well as a significant number of patients who left against medical advice. The lower mortality can also be attributed to the above cause and cannot be taken as a true reflection of the situation in the community.

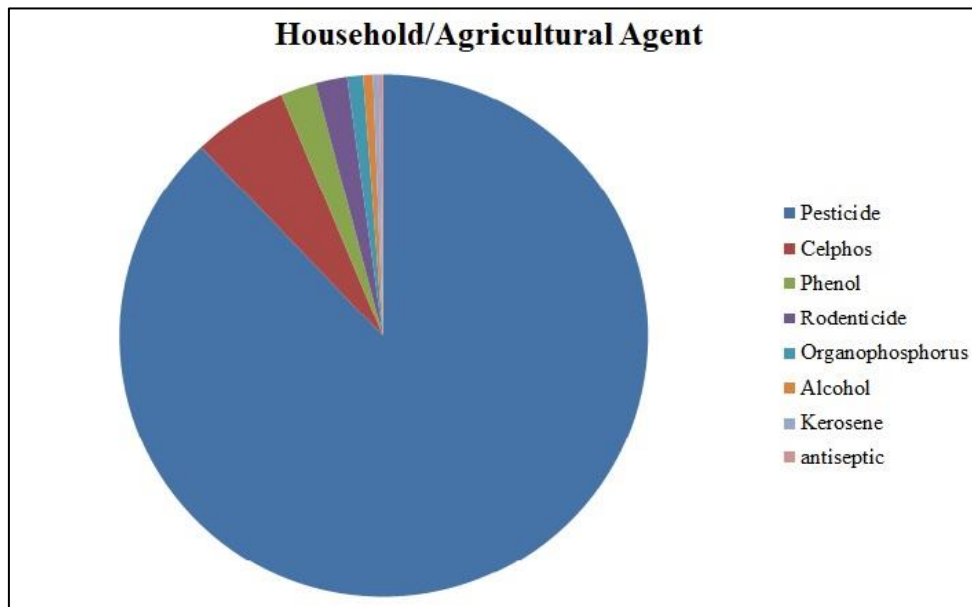
As noted above, each region has its unique toxico-epidemiology of poisoning owing to its geographical condition and population awareness. A detailed knowledge of the local poisoning patterns helps the physician formulate a plan for management and also aim at primary prevention. Studies from Eastern India are few and especially Jharkhand which is primarily and agriculture driven economy is lacking. Through our study we have tried to provide a comprehensive view of the current situation in our region.



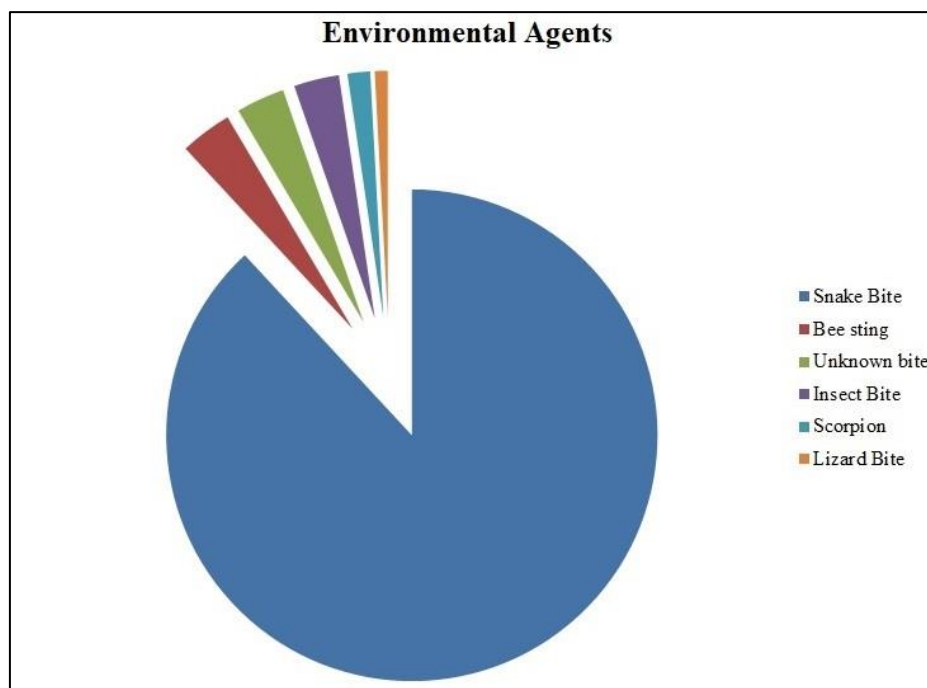
GRAPH 1: Bar Graph Illustrating the Age and Gender Distribution of the Cohort The incidence was maximum in the age range of 21-30 years with 34%, closely followed by those between 11-20 years with 31.4%.18.6%, 7.7%, 5%, 2.2% and 0.5% belonged to ranges 31-40 years,41-50 years, 51-60 years, 61-70 years and more than 70 years respectively



GRAPH 2: Seasonal Distribution of Accidental and Intentional Poisoning Cases Line diagram depicting the seasonal incidence of poisoning. Lower incidence is noticed in the summer months between march and May, while higher incidence especially of accidental exposure was found in rainy season in the months of June to August.



GRAPH 3: Pie Chart Representing the Distribution of Various Household/ Agricultural Agents Pie chart depicting the incidence of various household or agricultural substances alleged to be consumed. Pesticides account for majority of intentional poisoning followed by celphos.



GRAPH 4: Pie Chart Representing the Distribution of Various Environmental Agents Pie chart depicting the environmental agents in accidental exposure, with majority being snake bite, followed by bee sting, insect bite and unknown animal bite.

CONCLUSION

Intentional poisoning in the form of para suicide comprised the majority of our cohort closely followed by snake bites. Both these were favoured by the geographical location of the study centre. Illiteracy and lack of awareness were deemed to be the major contributing factors. The morbidity and mortality due to poisoning can be reduced by making specific antidotes available in adequate quantity, especially anti snake venom, conducting educational programs targeting rural areas and providing counselling services and poison information to those in need. A comprehensive approach targeting the problem at grass root level can lead to decreased in the incidence of such poisoning cases and also reduced the incurred burden on the health care system.

Conflicts of interest/competing interests:

The authors declare that they have no competing interests.

Author's contribution

AKB conducted the patient interviews. Both AKB and KKI compiled the data. KKI conducted the statistical analysis and wrote the manuscript. All authors reviewed the final manuscript.

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