

Pattern of Poisoning cases in a Hospital in a Terai district of Central Nepal

CK Gurung, R Dahal, P Khanal, S Nepal and AK Jaiswal

Department of Community Medicine and Family Health, Institute of Medicine, Kathmandu, Nepal

Corresponding author: Dr. Ranjan Dahal, Department of Community Medicine and Family Health, Institute of Medicine, Kathmandu, Nepal; e-mail ranjan201@hotmail.com

ABSTRACT

Poisoning is a major global health problem and is one of the major causes of hospitalization through emergency. The objective of this study is to evaluate the characteristics of poisoning cases admitted to emergency department over a one year period. A hospital based study was carried out in the emergency department, Mahendra Adarsha Chikitsalaya, Chitwan analyzing the data of the poisoning cases attended for one year duration by searching all the medical records. A total of 921 poisoning cases presented to emergency department in the year 2007. The female to male ratio was 1.17:1. Most of poisoning occurred in the age group 15-24 years. Snake bite was the commonest form of poisoning amongst all cases. By occupation, 46.0% cases were in farmers. Accidental poisoning prevailed over intentional poisoning. Seasonal trend revealed maximum cases being in summer (42.4%). Poisoning shows seasonal trend and hence proper intervention is required in community level.

Keywords: Poisoning, insecticides, central Nepal Terai region.

INTRODUCTION

Acute poisoning is a medical emergency and is a common cause of morbidity and mortality amongst the hospital admissions. Nepal being the agro-based country and farming being the main occupation, there is not only an increased chance of venomous stings but also peoples have an easy access to pesticides and rodenticides. The statistics of "poisoning cases" in Nepal as mentioned in 'Annual Report 2001/2002' shows that majority of patients (45.0%) were admitted to the hospitals with the history of poisoning due to unspecified substances followed by contact with venomous animals like snakes (26.4%).¹

The agriculturally prosperous terai region with hot climate, high seasonal rainfall, lush natural vegetation, and high density of rodents make ideal habitat for snakes to live and increase availability of marshy land to undergo hibernation. The abundance of snake and human activities, mainly, at agricultural land increases chances for snake bite. Pesticide poisoning from occupational, intentional and unintentional exposure is a major problem of developing world.² Millions of people are exposed to danger by hazardous occupational practices and unsafe storage.³

However, the nature of poisoning may vary from one region to another depending upon envenomous reptiles, poison availability and the knowledge of local population regarding poisonous properties. This study was undertaken to assess the distribution of case according to age, sex, occupation, nature, season, year and type of

poisoning and to deduce the information to initiate preventive measures to decrease the poisoning cases.

MATERIALS AND METHODS

A retrospective analysis of all poisoning cases who attended the emergency unit of Mahendra Adarsha Chikitsalaya, Chitwan over a period of one year (Jan 1 2007 to Dec 31 2007) was done. The data was collected by searching all the medical records manually. A total of 921 cases were included in the study, and the data of previous three years was used for the comparison of data of 2007. Data regarding age, sex, occupation, types of poisoning, date of presentation of the cases and purpose of poisoning were enumerated from record.

RESULTS

From the record of 2004 to 2007, the total cases found were more or less similar {Fig-1}. A total of 921 cases of acute poisoning attended the emergency department in the study period of January to December 2007. The affected cases of female to male ratio were 1.17:1. By age group, maximum number (212, 23.0%) of the cases belonged to 15-24 years while the minimum number (43, 4.7%) was in age group 55-64 years {Table-2}. Three hundred ninety one (42.4%) of total cases were reported in summer and only 106 (11.5%) were reported in winter {Fig-2, Table-3}. Similar pattern was observed in previous three years {Fig-2}.

In this study, snake bite (39.7%, 366) was the most common form of poisoning followed by insecticide (19.8%, 182) {Fig-3}. Among insecticides,

Table-1: Distribution of cases by occupation

Occupation	No of cases (%)
Farmer	423 (46)
Housewife	295 (32)
Student	120 (13)
Service holder	28 (3)
Laborer	18 (2)
Business	9 (1)
Others	28 (3)
Total	921 (100)

organophosphate (46.1%, 84) was the most commonly used agent. It was followed by zinc phosphide (31.9%, 58), cypermethrin (11.5%, 21), aluminium phosphide (3.3%, 6) and miscellaneous (7.1%, 13).

As per occupation, 423 (46.0 %) of the cases were farmers, 295 (32.0%) housewives, 120 (13.0%) students and remaining work in industry, government jobs {Table-1}. Majority of poisoning cases were accidental (81.5%, 751).

DISCUSSION

In the study, yearly trend of incidence of poisoning cases was fairly static over four years. More than 800 cases presented in the emergency department of Mahendra Adarsha Chiktisalaya, Chitwan every year. Three hundred ninety one (42.4%) of cases were reported during summer season. Seasonal trend analysis of poisoning cases in the study hospital showed comparable pattern in 2004, 2005 and 2006 A.D. also. Similar seasonal variation with summer preponderance was observed in study done in western Nepal.⁴ Owing to snakes, which come out of hibernation in this time, and agricultural activities, the summer preponderance, is justified.

The study showed that poisoning was more common in female in compared to male (1.17:1). The ratio varied from 1.01 to 1.3 in other studies done in Nepal.⁵⁻⁸ Involvement of female in agricultural activities in relatively higher number in our study area can be the

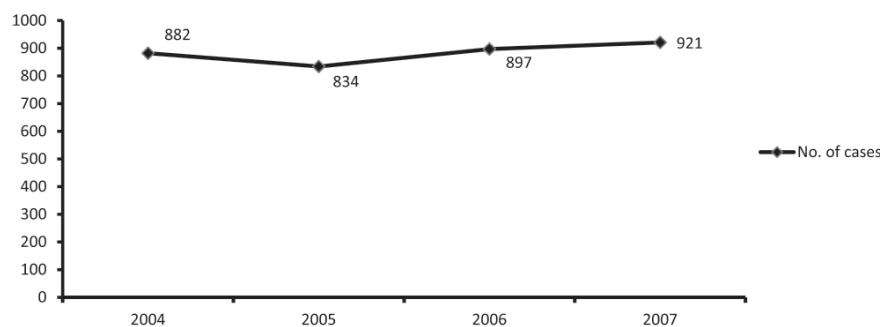


Fig. 1. Yearly trend of poisoning

Table-2: Distribution of cases by age

Age group	No. of cases (%)	Percentage
<5	83 (9)	9.0
5-14	157 (17)	.0
15-24	212 (23)	.0
25-34	173 (18)	.8
35-44	124 (13)	.5
45-54	83 (9)	0
55-64	4 (3)	4.7
65& above	46 (5)	.0
Total	921 (100)	

most approximate explanation for this female dominance.

Being a Terai district, snake bite constitutes the bulk of total cases (366 out of 921 cases, 39.7%). Similar results were obtained in a study done in eastern terai region in Nepal where there was 407 admissions/hospital/year due to snake bite. The study done in other terai district hospital came out with comparable number of cases (Siraha -341, Lahan- 357, Inaruwa- 287). However the true impact of snake bite in the community cannot be estimated as the epidemiological data in Nepal are minimal and rely exclusively on hospital register.⁹ Out of total cases of snake bite, 208 (56.9%) were reported in summer. A study done in Hyderabad showed similar results, the majority of snake bite cases were reported in the month of July and August.¹⁰ Of the total snake bites, 247 (67.5%) was seen in age group 15-44 years. In a study done in snake bite, the maximum number of cases (66.0%) was reported in the age group 11- 40 years.¹¹ Being productive, people of this age group are more susceptible to outdoor hazards including snakebite as one of the commonest poisoning as noted earlier.

Insecticide was the second most common form of poisoning comprising 182 (19.8%) of total cases, out of which 46.7% of cases were reported in summer. Chitwan, being an agricultural area, easy and abundant availability

of insecticides probably account for the higher incidence of this form of poisoning. Another study showed maximum number of insecticide cases, 85 (31.7%), recorded in summer.¹² 76 (41.7%) of cases fall in age group 15-34 years. Similarly the study done in KMC revealed that most of the cases, i.e. 38.8% were between 21-30 yrs.⁵ In a similar study at

Table-3: Distribution of different type of cases by season

	Spring	Summer	Autumn	Winter	Total
Snakebite	40(4.3%)	208(22.6%)	112(12.2%)	6(0.6%)	366(39.7%)
Insecticide	43(4.7%)	85(9.2%)	34(3.7%)	20(2.2%)	182(19.8%)
Food Poisoning	38(4.1%)	68(7.4%)	47(5.1%)	22(2.4%)	175(19.0%)
Kerosene	10(1.1%)	6(0.6%)	22(2.4%)	2(0.2%)	40(4.3%)
Mushroom	-	15(1.6%)	9(1.0%)	5(0.5%)	29(3.1%)
Others	7(0.8%)	5(0.5%)	19(2.1%)	19(2.1%)	50(5.4%)
Unknown	19(2.1%)	4(0.4%)	24(2.6%)	32(3.5%)	79(8.6%)
Total	157(17.1%)	391(42.3%)	267(29.1%)	106(11.5%)	921(100%)

Bir Hospital, 14-29 age groups are found to be the most vulnerable.⁶ Eighty four (46.1%) of total insecticide poisoning cases consume organophosphates followed by zinc phosphide (31.9%, 58). Similar pattern of type of insecticide poisoning was seen in other studies as well.^{8,13-15}

One hundred seventy five (19.0%) cases were of food poisoning. Most cases go unreported and scientific investigations are rarely feasible. Though most food-borne diseases are sporadic and often not reported; a nationwide study in India reported an alarming 13.2% prevalence at household.¹⁶

Incidence of kerosene poisoning had been found only in less than 15 year group which made up 40 (4.3%) cases of overall poisoning cases of the year. Twenty two (55.0%) of kerosene poisoning cases were below 5 years of age. This can be attributed to the active and curious nature of children. Similar result was found in a study done in NMC where 68.0% of all kerosene poisoning was found in children below 5.¹² Fifteen (51.7%) of total mushroom poisoning cases were reported in summer. An article on mushroom poisoning in Nepal showed

similar result of high incidence of mushroom poisoning in the months of May, June and July.¹⁷

This study showed that 423 (46.0%) of cases were farmer by occupation followed by housewife (32.0%, 295) and student (13.0%, 120). The result was similar to the one found in a study done in Kathmandu University Teaching Hospital.⁷ Our study showed that accidental poisoning (81.5%) prevails over intentional poisoning (18.5%). The result is in contrast to that in other places.⁵⁻⁷ It is due to the fact that majority of the cases in our study is due to snake bite and food poisoning which are unintentional.

Due to unsystematic and unscientific recording of in-patients and lack of documentation of follow up, the outcomes of poisoning couldn't be assessed. Owing to lack of report on insecticides, relation between agriculture and insecticide poisoning couldn't be studied precisely.

Most of the cases of poisoning occurred in younger age group and farmer by occupation. This pattern analysis can be of considerable help to take up appropriate planning and prevention measures in reducing the incidence. The high number of cases reported for snake bite followed by insecticide poisoning and food poisoning had remained static for last four years indicating towards inadequacy of measures to tackle these issues. It is important to strengthen the preventive measures by educating the people through drug education program, increase awareness among the youths about the harmful effects of drugs and envenomous stings, promote the poisoning information centre, introduce separate toxicological units in the

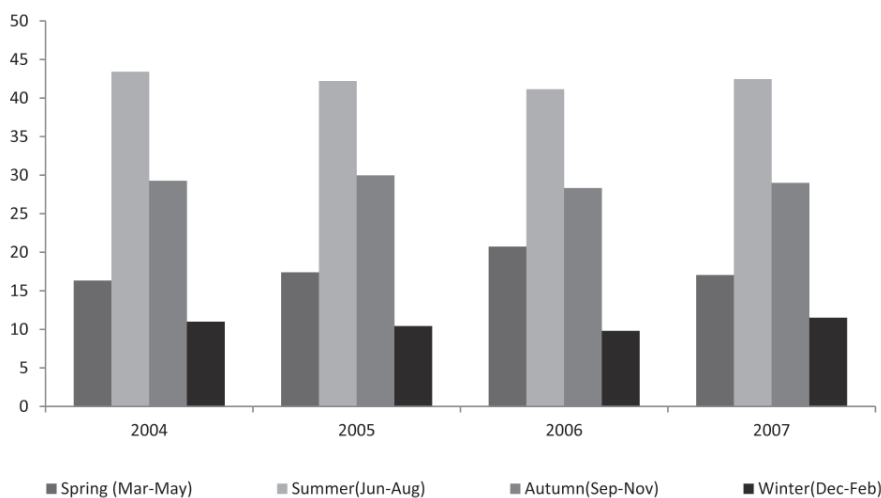


Fig. 2. Seasonal variation of poisoning

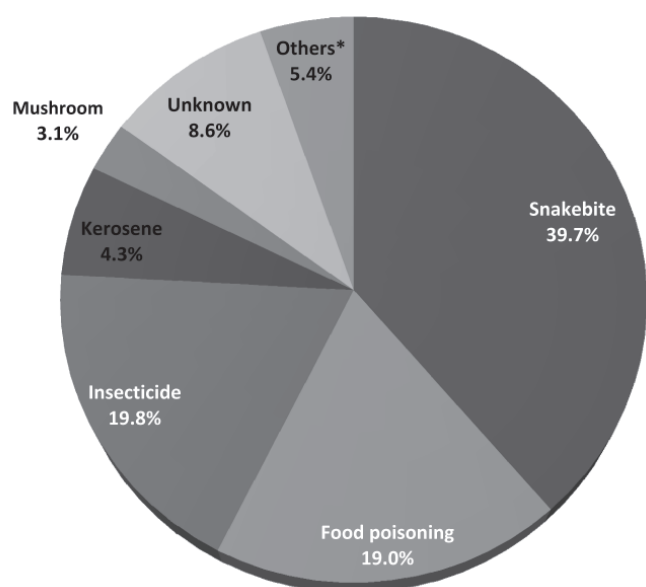


Fig. 3. Types of poisoning

*Others: Alcohol, drug, insect bite, dendrite

hospitals and upgrade the peripheral health centers to manage cases of poisoning effectively in the emergency. By increasing awareness among health care workers of the plight of farmers, the authors hope to encourage development of stronger public health infrastructure and improve the health status of the true individuals.

REFERENCES

1. Hospital Inpatient Morbidity by Age and Sex. Annual Report 2058/59 (2001/2002), Department of Health Services, His Majesty's Government of Nepal, Ministry of Health. Annexure III: 404
2. Jeyaratnam J. Acute pesticide poisoning: a major global health problem. *World Health Statistics Quarterly* 1990; 43: 139-44.
3. Karalliedde L, Eddleston M, Murray V. Epidemiology of organophosphate insecticide poisoning In : Karalliedde L,

Marrs T, Feldman F, Henry JA (eds) Organophosphate pesticides and Human health. London: Imperial College press; 2001.

4. Kishore PV, Palaian S, Paudel R et al. Pattern of poisoning cases in a teaching hospital in Western Nepal. *J Inst Med* 2008; 30:26-34.
5. Khadka SB, Ale SB. A Study of Poisoning Cases in Emergency Kathmandu Medical College Teaching Hospital. *Kathmandu Univ Med J* 2005;3:388-91
6. Singh DP, Acharya RP. Pattern of Poisoning Cases in Bir Hospital. *J Inst Med* 2006;28:3-6
7. Marahatta SB, Singh J, Shrestha R, Koju R. Poisoning Cases Attending Emergency Department in Dhulikhel Hospital-Kathmandu University Teaching Hospital. *Kathmandu Univ Med J* 2009;7:152-6
8. Pokhrel N, Gurung CK. A study of poison cases recorded at Bir Hospital over four years. *J Inst Med* 1987; 9: 29-34.
9. Sharma SK, Khanal B, Pokhrel P, Khan A, Koirala S. Snakebite- reappraisal of the situation in Eastern Nepal. *Toxicol* 2003; 41:285-9.
10. Hayat AS, Khan AH, Shaikh TZ, Ghouri RA, Shaikh N. Study of Snake bite cases at Liaquat University Hospital Hyderabad/Jamshoro. *J Ayub Medical College Abbottabad Pakistan* 2008;20:125-7
11. Meenatchisundaram, S, Michael A. Snake Bite and Therapeutic Measures: Indian Scenario. *Indian Journal of Science and Technology* 2009;2:69-73
12. Bharati U, Shrestha JB, Sharma M. Study of acute poisoning in Nepal Medical College Teaching Hospital. *Nepal Med Coll J* 2001; 2: 83-5.
13. Prasad PN, Karki P. Poisoning cases at TUTH Emergency- A one-year review. *J Inst Med* 1997; 19:18-24.
14. Kafle KK, Gyawali K. Organophosphorous- commonest poisoning agent. *J Inst Med* 1992;14: 228-33
15. Ghimire RH, Sharma SP, Pandey KR. A comparative study of acute poisoning in Nepal at tertiary and secondary level hospitals. *J Nepal Med Assoc* 2004;43:130-3
16. Sudershan RV, Rao P, Polasa K. Food safety research in India- a review. *Asian J Food Agro- Industry* 2009; 2: 412-3.
17. Aryal TR. Mushroom Poisoning Problem in Nepal and Its Mitigation. *Fungi* 2009; 2: 44-6.