Research Article

Pattern of poisoning cases at a tertiary health-care center, Belagavi

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Abstract

Background: Poisoning, both accidental and intentional (homicidal/suicidal), is an important contributor to death and illness all over the world. Not all sickness can be avoided or cured, but that owing to poisoning, with which we are particularly concerned here, is largely curable and preventable. According to the WHO, more than 3 million poisoning cases have been reported, of which 252,881 deaths occurred worldwide, of which 99% are from developing countries. So, this study has been taken to determine patterns of poisonings in a tertiary hospital.

Objective: To know the pattern of poisoning cases admitted at a tertiary-care hospital.

Materials and Methods: A retrospective record-based study of all poisoning cases admitted at KLE Hospital from January 2012 to December 2012 was done. Data were collected from Medical Records Department, KLE Hospital. Sociodemographic details such as age, sex, occupation, type of poisoning, length of hospital stay, outcome, and other details were collected from the patients' case notes, treatment charts, nursing notes, laboratory reports, and discharge summaries.

Result: Male to female poisoning ratio was 1.65:1. Commonly used poisons were organophosphate (OP) compounds (71.8%), rat poison (10%), pyrethroid compounds (4%), herbicidal poison (4%), drug poisoning and endosulfan (1% each), and unknown poisoning (2%). Of 110 cases, 47% improved, 27.2% improved with some morbidity, 14% resulted in mortality, and 12% went against medical advice.

Conclusion: Poisoning rates are seen more among, the farmers and young population, OP poisoning being the most common type. Poison information centers could be set up along with first aid facilities and manpower provisions at primary health-care level.

KEY WORDS: Pattern, poisoning, tertiary, hospital, Belagavi

Introduction

The word poison means "a substance that causes damage, morbidity, or mortality, particularly by chemical manners." Poisoning is a huge epidemic of noncommunicable disease in this century. Among the unnatural deaths, deaths owing to poisoning fall next only to road traffic accident deaths. Poisoning can take place in all areas and countries and affect people of all age and income groups. Commonly, accidental poisoning is more usual in children, whereas suicidal poisoning is more customary in young adults.[1]

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The prevalence and deaths owing to poisoning in developing countries have been increasing steadily in recent years. The WHO conservatively roughly calculates that the occurrence of pesticide poisoning, which is more in developing countries, has increased twofold during the last 10 years.[2] In the United Kingdom, poisoning accounts for an estimated 10%–20% of acute medical admissions and 5%–10% of the workload of Accident and Emergency (A&E) Department. However, in India, the exact incidence cannot be defined as there is underreporting of cases of poisoning. The nature of poison used varies in different parts of the world and may vary even in different parts of the same country. Management of these

critically ill patients will largely get better if the general causes of poisoning are properly defined.[3] With the improvement in the industrial and agricultural fields and advances in medical sciences, a huge number of insecticides have become accessible, which on exposure may produce severe toxicity. Information available in our country is little with regard to acute poisoning in adults, including those hospitalized.[4] It is significant to know the kind and extremity of poisoning in order to take the right preventive measures. In this context, this study was carried out with the objective to investigate the pattern of acute poisoning cases in a tertiary-care hospital in Belagavi, Karnataka.

Materials and Methods

A retrospective record-based study of all poisoning cases admitted at KLE Hospital from January 2012 to December 2012 was considered. Data were collected from Medical Records Department, KLE Hospital after obtaining permission from the medical superintendent. Sociodemographic details such as age, sex, occupation, type of poisoning, outcome, and other details were collected from the patients' case notes, treatment charts, nursing notes, laboratory reports, and discharge summaries. Severity score was assessed by the information in case sheets using Poison severity scoring (PSS) system. PSS is a standardized scale for grading the severity of poisoning and allows qualitative evaluation of morbidity caused by poisoning. It is based on the severity of the symptom at the time of presentation.[5]

Ethical clearance was obtained from Institutional Ethical Committee, JN Medical College.

Severity Grades

None (0): no symptoms or signs related to poisoning;
minor (1): mild, transient, and spontaneously resolving symptoms;
moderate (2): pronounced or prolonged symptoms;
severe (3): severe or life-threatening symptoms; and
fatal (4): death.

Statistical Analysis

Statistical analysis done by using percentages and χ^2-test using SPSS software, version 19.

Result

Among the total poison incidents reported to hospital, 154 were adults, and nine were children. A total of 110 case records could be analyzed. Male to female poisoning ratio was 1.68:1. More than half of the cases were seen in young age group of 18–28 years, with almost similar proportion of cases among male and female subjects [Table 1].

Of the total, 41.8% of the poisoning cases were farmers, 24.5% housewives, and 13.6% students [Table 2].

Majority (71.8%) of the cases were owing to organophosphate (OP) compound poisoning, followed by 10% cases of rodenticide poisoning [Table 3].

Among the admitted cases, 47.2% (52) of the cases showed clinical improvement, and death was seen among 13.6% of the cases. Discharge against medical advice was taken by 11.8% (13) cases [Table 4].

The severity of illness was determined and categorized as per the indicators—PSS systems. A majority of patients with mild to moderate (grades 1 and 2) predicted severity recovered from poisoning (improved category). Patients with severe

Table 1: Age-wise distribution of poisoning cases

Age (years)	Male (*n* = 69)	Female (*n* = 41)	Total (*n* = 110)
<17	3 (4.3)	3 (7.3)	6 (5.5)
18–28	37 (53.6)	24 (58.5)	61 (55.45)
29–39	12 (17.3)	11 (26.8)	23 (20.9)
>40	17 (24.6)	3 (7.3)	20 (18.1)

Values in parentheses are percentages.

Table 2: Distribution of poisoning cases based on their occupation

Occupation	Number of cases (%)
Farmer	46 (41.8)
Student	15 (13.6)
Housewife	27 (24.5)
Others	22 (20.1)

Table 3: Distribution of cases depending on type of poisoning

Type of poisoning	Cases, *n* (%)
Organophosphate	79 (71.8)
Rodenticide	11 (10)
Pyrethroid	4 (3.6)
Endosulfan	4 (3.6)
Herbicide	4 (3.6)
Carbamate	3 (2.7)
Flubendiamide	1 (1)
Drugs	2 (1)
Unknown	2 (2)

Table 4: Distribution of poisoning cases based on their clinical outcome

Outcome	Cases, *n* (%)
Improved	52 (47.2)
Improved with morbidity	30 (27.2)
Death	15 (13.6)
DAMA	13 (11.8)

DAMA, discharge against medical advice.

Table 5: Association between Poison Severity Scoring and clinical outcomes of the patients

Poison severity scoring	Improved, (*n* = 52)	Improved with morbidity (*n* = 30)	Dead/DAMA (*n* = 28)	Total (*n* = 110)
Grade I	41 (87.2)	0	6 (12.8)	47 (100)
Grade II	9 (24)	19 (50)	11 (26)	39 (100)
Grades III and IV	2 (8.3)	11 (45.8)	11 (45.8)	24 (100)

Values in parentheses are percentages.
$\chi^2 = 57.693$; $df = 2$; $p < 0.001$.
Linear $\chi^2 = 33.419$; $p < 0.001$.

Table 6: Distribution of clinical outcomes of patients with respect to mode of admission

Clinical outcome	Direct admissions (*n* = 64)	Referred cases (*n* = 46)	Total (*n* = 110)
Improved	45 (70.3)	7 (15.2)	52
Improved with morbidity	9 (14.06)	21 (45.6)	30
Death and DAMA	10 (15.6)	18 (39.1)	28

Values in parentheses are percentages.

predicted illness (grades 3 and 4) were either discharged with morbidity or deceased/went against medical advice. There was a significant ($p < 0.001$) association between the clinical outcome and scores of PSS [Table 5].

Patients [i.e., 70.3% (45)] who were directly brought to the tertiary hospital showed improvement compared with only 15.2% (7) patients seen in those admitted to the hospital following first aid elsewhere (referred cases). Morbidity and mortality were seen more among the referred cases compared with direct admission (45.6% vs. 14%) [Table 6].

Intentional poisoning accounted for 97.2%. Among those, 15.6% were under the influence of alcohol and 12.8% showed previous psychiatric illness.

Discussion

In our study, male to female poisoning ratio was 1.68:1, which was similar to a study conducted at Mysore.[6] The high incidence may be because male subjects were more exposed to stress, strain, and occupational hazards compared with female subjects. Even accessibility of poisons are at more easier means for the male subjects when compared with female subjects; increased risk-taking behavior among male subjects also contributes to the same.[4,7] Most of the poisonings in this study have been seen in the age group of 18–28 years in both the sexes, which was similar to the study conducted at Mysore and North India.[6,8]

High poisoning rate of 72% was seen with use of OP compounds. The factors contributing to it are widespread availability and easy access, lack of knowledge about its storage and use, regulation laxity concerning the sales of such substances, and poor and insufficient medical care in developing nations in contrast to developed countries. Agrochemicals are easily available in our country as most of them here live their living on agriculture and, therefore, poisoning incidents are seen more among farmers.

Majority of the poisonings were intentional, which was similar to the findings of other studies.[6,9] Most of them were farmers followed by housewives and students. The reasons mainly being social such as poverty, unemployment, impulsive behaviors, stress owing to family burden, dowry harassment, serious health problems, depression, substance abuse, educational issues (e.g., failure in examinations and lack of financial support), and disappointment in love affairs.

PSS is a simple scoring system to assess the severity of the poisoning. We could see that, with increased severity, morbidity and mortality rates also increased. This simple measure can be used as a mode of grading of patients at peripheral hospitals, which in turn would help in timely referral. The findings of this assessment were in agreement with other studies, which have described a similar efficacy for PSS in predicting mortality among patients with OP poisoning.[10,11] In this study, we figured out that morbidity and mortality was more among the referred cases to the tertiary hospital than the direct admissions. The reasons may be delay in referral owing to lack of proper assessment of severity and delay in transport. Most of the OP poisoning cases are from rural areas, where they generally first visit the primary health center of that area. The first aid care given there matters a lot in deciding the prognosis of the case. Availability of the lifesaving drugs, availability of trained doctor, availability of transport services, and provision of spot laboratory diagnosis all make an impactful contribution in deciding the fate of the patient. Financial concern may be the other hindering factor, which makes people not to visit the tertiary hospital at first go.

Conclusion

Poisoning rate is seen more among the backbone population of India, that is, the farmers and young population, OP poisoning being the most common type. Poison information centers could be set up along with first aid facilities and

manpower provisions at primary health-care level. This could provide immediate treatment, which can help in saving the lives in many cases. As presented by our study, PSS is a simple tool, which can be involve in the training module of medical officers for better assessment and referral. Promotion of training and education of qualified mental health professionals, including adolescent psychiatrists, is needed considering the magnitude of the public health problems that can lead to suicide.

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