

Original Research Paper

Profile of Acute Poisoning Cases at Pravara Rural Hospital, Loni

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Abstract

This hospital based prospective cross sectional study was carried out over a period of two years duration from 01/09/2008 to 31/08/2010 in the Rural Medical College and Pravara Rural Hospital, of Pravara Institute of Medical Sciences, Loni, Taluka Rahata, Ahmednagar (M.S) India to know the socio-demographic profile and pattern of acute poisoning in the rural region. All admitted and brought dead cases of acute poisoning, cases of known and unknown bites and stings from all age were included in the study. Total 557 cases of acute poisoning were recorded out of which 62 (11.13%) cases were fatal. Most of the poisoning cases were male 325 (58.35%), belonged to literate group 173 (31.06%) and the lower middle socioeconomic class (class III) 290 (52.7%). Farm owners, clerical, shop owners group was most commonly 143 (25.68%) affected and most common route of poisoning was oral ingestion (64.81%). In maximum 247 (44.34%) cases category of poison was agrochemicals and maximum number of cases were of Organophosphorus insecticides (19.03%). Highest numbers of cases (50.81%) were suicidal. The present study helps to interpret the pattern of poisoning in the rural area.

Key Words: Acute poisoning, Snake bite & sting, Organophosphorus insecticides

Introduction:

At present due to vast developments in the field of chemistry and medical science, a significant number of new compounds have appeared as new poisonous substances. [1]

According to World Health Organization (WHO) reports, about 3 million people around the world consume poison every year, out of them 2, 20,000 deaths occur annually. About 99% of these deaths occur in the developing countries. About 50,000 deaths occur in India due to poisoning every year. [2]

With green revolution and industrialization, use of insecticides, pesticides, Organophosphorus compounds become a boon to agriculturists and horticulturists to protect crops and stored grains from pests and rodents.

Though these substances have been in the market only for a few decades in our country, they have created many serious problems, because most suicides in the recent years have been traced to their oral intake. [3, 4]

In India, due to the relative ease with which poisons are available, naturally or in the market, cases of human poisoning are commoner than the West. In cities, cases of poisoning by acids, cyanides and various alkaloids are of occasional occurrence.

Accidental poisonings are more uncommon here than in developed countries, though instances of accidental poisoning of agricultural and industrial workers are reported.

Thus all forms of poisoning namely homicidal, suicidal and accidental are reported from all parts of the country. [1]

From ancient times, human and animals have been victims of snake bites and it has become a rural and occupational hazards worldwide. Frequently reported mortality of snake bite in India alone is over 15,000 per annum [5] and 40,000 to 60,000 per annum worldwide (2.35%). [6]

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The recognition of poisoning during life is a matter of first importance. The availability of various poisons, socio-economic status of the population, religious and cultural influences, the prescribing pattern of drug, the etiology and demographic characteristics of acute poisoning are likely to be the key determinants for the development of preventive measures, early diagnosis and treatment of poisoning cases, hence it is of critical importance that these factors be firmly established. [7]

In India, due to variations in geographical conditions and differences in religious and cultural practices, the incidence and pattern of poisoning vary from place to place, hence it is desirable to perform regional studies periodically to recognize the extent and evolution of the problem.

Aims and Objectives:

The present study is undertaken to know the socio-demographic profile and pattern of acute poisoning which is necessary not only for the purpose of early diagnosis and treatment of poisoning but also for its preventions.

Material and Methods:

This hospital based prospective cross sectional study was carried out over a period of two years duration from 01/09/2008 to 31/08/2010 in the Rural Medical College and Pravara Rural Hospital, of Pravara Institute of Medical Sciences, Loni, which is a tertiary care teaching hospital chiefly catering to the demands of rural area of Ahmednagar & adjacent districts of Maharashtra.

It was also approved by Institutional Ethics and Research committee.

All admitted and brought dead cases of acute poisoning, cases of known and unknown bites and stings from all age were included in the study. All cases of chronic poisoning, poisoning cases admitted and referred to other hospitals, absconded cases, brought dead cases without history of acute poisoning, cases admitted without history of poisoning, bites and stings were excluded from the study.

Comprehensive proforma for the study was designed which contains demographic aspect and pattern of poisoning cases. Relevant data of the individual poisoning cases was collected from medico-legal cases register of casualty, case papers from concerned department, inquest, post-mortem reports, chemical analysis report after taking informed consent from patient or relatives.

Data was statistically analyzed using statistical software SPSS Statistic 17 and Microsoft Office Excel 2003.

Observations and Results:

During the period of 24 months from September 2008 to August 2010 total 557 cases of acute poisoning were reported out of which majority of cases 495 (88.87%) were recovered and discharged, 15 (2.7%) cases were brought dead and 47 (8.43%) cases died during treatment. Total mortality due to poisoning was found to be in 62 (11.13%) cases.

This study revealed that out of 557 cases, 325(58.35%) were males while 232 (41.65%) were females. Males outnumbered females with male: female ratio of 1.40:1.

In the present study maximum number of cases were observed in age group of 21–30 years 195 (35.01%) followed by 0–10 years 101 (18.14%), 11–20 years 100 (17.95%) and least number of cases were found in the age group of 71-80 years and 61-70 years with 7 (01.26%) and 11 (01.97%) cases respectively. (Table 1) Out of total 557 cases, maximum cases (31.06%) were those having completed their educational qualification up to higher secondary school certificate, intermediate, ITI.

The second largest group 135 (24.24%) consisted of those who had completed education till secondary school certificate level. Only 19 (03.41%) cases were illiterate.

No poisoning case was found having educational status as professional degree, honors degree and postgraduate degree. Educational status was not applicable in 82 (14.72%) cases as those were children below five years of age. (Table 2)

In our study maximum cases of acute poisoning were found in farm owners, clerical, shop owners 143 (25.68 %) followed by students and housewives each with 118 (21.18%) cases and unemployed 50 cases (08.98%). No case was found in professional group. (Table 3)

Socio-economic status was determined according to All India Consumer Price Index 2008 and Modified Prasad Classification. [8] Present study showed that the maximum cases were from lower middle socio-economic class III (52.07%) followed by upper lower class (29.62%) while only 04 cases (00.72%) were from upper class. (Table 4)

Oral route of poisoning was observed in maximum cases 361 (64.81%) followed by bite & sting in 191 (34.29%) cases. Inhalational route was observed in 3 (00.54%) cases and dermal route in only 2 (00.36%) cases.

In this study maximum 247 (44.34%) cases were due to agrochemicals, followed by animal bites and stings 191 (34.29%), household poisons 28 (05.03%) and

pharmaceutical drugs (2.51%). Industrial chemicals were found in(00.36%) cases, miscellaneous 6 (1.08%) cases and plant poisons in 10 (1.8%) cases. In (07.54%) cases the poison was unknown and in (3.05%) cases the results of analysis was pending. (Table 5)

Table 1: Age and sex Wise Distribution of Acute Poisoning Cases

Age Grps (Yrs)	Male (%)	Female (%)	Total (%)
0-10	63(11.32)	38(6.82)	101(18.14)
11-20	55(9.87)	45(8.08)	100(17.95)
21-30	107(19.21)	88(15.8)	195(35.01)
31-40	48(8.61)	32(5.75)	80(14.36)
41-50	29(5.21)	13(2.33)	42(7.54)
51-60	14(2.51)	07(1.26)	21(3.77)
61-70	02(0.36)	09(1.61)	11(1.97)
71-80	07(1.26)	00(0.0)	07(1.26)
Total	325(58.35)	232(41.65)	557(100)

Table 2: According to Educational Status

Educational status	Cases (%)
Professional degree, honors degree, postgraduate degree	00 (0.0)
Graduation	44(7.9)
Higher secondary school certificate (HSC), Intermediate, ITI (Industrial training institute)	173(31.06)
Secondary school certificate (SSC)	135(24.24)
Middle school certificate (7 th Class)	61(10.95)
Primary school (Literate)	43(7.72)
Illiterate	19(3.41)
Not applicable to children below 5 years of age	82(14.72)
Total	557(100)

Table 3: Occupation wise Distribution

Occupation	Cases (%)
Professional	00(0.0)
Farm owners, clerical, shop owners	143(25.68)
Skilled workers	01(0.18)
Semiskilled workers	20(3.59)
Unskilled workers	25(4.49)
Unemployed	50(8.98)
Student	118(21.18)
Housewife	118(21.18)
Not applicable to children below 5 years of age	82(14.72)
Total	557(100)

Table 4: According to Socio-Economic Status

Socio-economic status	Cases	%
Upper (Class-I)	04	00.72
Upper middle (Class II)	62	11.13
Lower middle (Class III)	290	52.07
Upper Lower (Class IV)	165	29.62
Lower (Class V)	36	06.46
Total	557	100

Table 5: According to Category of Poisons

Category of Poisons	Cases	%
Agrochemicals	247	44.34
Industrial chemicals	02	00.36
Household poisons	28	05.03
Pharmaceutical drugs	14	02.51
Animal bites and stings	191	34.29
Plant poisons	10	01.80
Miscellaneous	06	01.08
Unknown	42	07.54
Pending	17	03.05
Total	557	100

Table 6: According to Manner of Poisoning

Manner	Total (%)
Suicide	283 (50.81)
Homicide	00 (00.00)
Accidental	269 (48.29)
Undetermined	05 (00.89)
Total	557 (100)

The maximum number of cases was of Organophosphorus insecticides (19.03%) which were followed by Formamidine group of pesticide amitraz (14.54%). Most common snake bites cases were of Vasculotoxic snake bite 48 (8.61%). Kerosene was detected in (4.31%) cases, Organochloro insecticides in (4.13%) cases, pyrethroid insecticides in (3.95%) cases, scorpion bite (sting) in (3.41%) cases and Organophosphorus & pyrethroid mixed insecticide in (2.15%) cases.

In 42 (7.54%) cases the type of poison could not be known and in another 37 (6.64%) cases were attributed to unknown bites.

Our study revealed that highest number of cases were suicidal (50.81%) followed by accidental (48.29%) and in only 05 (00.89%) cases the manner of death was undetermined. No case was found to be homicidal. (Table 6)

The categorization of the cases according to the manner of poisoning was done based on the information available from history given by patient, relatives, the treatment records, the documents received from police at the time of autopsy and the autopsy findings. In case of conflicts in the history, manner was categorized as undetermined.

During the study no attempt was made to consider the police investigations, court proceedings and orders in each individual case in order to categorize them according to the manner of poisoning.

Discussion:

During the study period, total 557 cases of acute poisoning were recorded. Mortality found in the present study was 11.13% which was less than mortality reported by Sinha US et al study (33.69%). This may be due to fact that this Pravara Rural Hospital, Loni is a tertiary care teaching hospital and hence easy and faster approach to this hospital and early treatment may have reduced mortality.

Our study revealed that male outnumbered females Findings of the present study are consistent with other author's study. [1-3, 9, 11] This may be because males are more exposed to stress and strains of day to day life as they have to run the family and bear many pressures i.e. economic problems, difficult life conditions and various psychological stresses.

Males are also exposed to occupational hazards and they have easy accessibility to the agrochemicals and they often need to handle it in agricultural work. But our findings are in contrast to finding of Kristinsson J et al [7] and Alagozlo H et al [12] who reported that females outnumbered males. This may be due to fact that females prefer toxic ingestion for inflicting self-harm relative to males and this finding might reflect a tendency by females to use deliberate ingestion as a help seeking behavior in stressful situations. [13]

In this study maximum numbers of cases were observed in age group 21–30 years (35.01%) similar to other observations. [2, 9, 10] This may be due to social or familial problems as this age group is suffering from all types of stress and strain i.e. domestic, economic, unemployment, educational, dowry, marital conflicts, failure in love etc.

In our study maximum number of cases (31.06%) were having their educational qualification as higher secondary school certificate, intermediate, ITI in the present study. This finding of present study was consistent with study done by SK Dhatarwal [13] This may be due to fact that such incomplete educational status does not warrant sufficient economical outcome and satisfaction.

Similarly they may have false confidence about right or wrong things. In such situations, family conflicts and any other stressful situation may be a cause for impulse for suicide in these victims as they are immature to control anger and to bear stress.

In the present study only 19 (03.41%) cases were illiterate which was in contrast to findings of the study done by Dhatarwal SK [13] and Chaudhary BL et al [2]. It may be due to more knowledge of the poisons as compared to illiterate persons. Though Loni is a village in a rural area, it is an educational hub with more than 15 colleges and thousands of students and hence the surrounding rural population is literate. Hence in the present study the victims of poisoning were found to be literate.

In this study the numbers of poisoning cases were higher in farm owners, clerical, shop owners group and it was consistent with Bhatukule PR study. [11] This can be explained by the fact that major population of India mainly depends upon agricultural activities which in turn is affected by seasonal variation. So sometimes the farmers are able to grow their crops and sometimes they fail due to seasonal variations and irregularity of monsoon season.

This lead to less income compared to the hard work done, financial crisis, frustrations,

tensions etc. and in such situations, easy availability of agricultural chemical poisons due to their occupation makes them more vulnerable to consume poison. Students are exposed to educational stress, expectations from parents and in such situation, fear of examination or failure may provoke them to consume poison.

Similarly housewives also are one of the commonest victims of poisoning. As housewives are economically not independent and dowry demands are common in rural area. There is higher incidence of violence against women. So social and economic instability may leads to poisoning in housewives. As the professional group is socioeconomically sound, poisoning cases are not reported in this group.

The present study showed that maximum cases (52.07%) were from lower middle socio-economic class III which was consistent with others. [10, 13] The middle and lower socioeconomic group are more vulnerable for poisoning which may be due to the fact that they are under continuous financial and other stress during life.

In this study oral route (64.81%) was the commonest route of exposure to poison. Chavan KD et al [9] and Zariwala RC [4] also observed commonest route of exposure to poison as oral route in 89.13% and 90.3% cases respectively.

Reason for these differences in the percentage of oral route may be due to fact that these studies had excluded bites & sting i.e. snake bites, unknown bites and scorpion stings.

Bite & sting is one of the common routes of poisoning in this area as this rural area acts as a habitat for snakes. It signifies the need of more emphasis in treatment of poisoning by oral route as compared to others.

In spite of extensive search we could not compare distribution of poisoning cases according to category of poisons. Findings of the present study were similar to the Wananukul W et al study [14] in Thailand which showed that maximum cases were due to pesticides (41.5%).

But it was in contrast with the same study as regards the findings of animal bite and stings which were relatively less (2.7%) as compared to present study (34.29%).

This may be due to fact that present study was done in rural area of India where main occupation is farming and agriculture and most of the agricultural work is done manually leading to more exposure to animal bite and stings as compared to more use of machineries in agricultural works in western countries. Food poisoning and recreational and abused agents like alcohol and food poisoning were observed in

0.5% and 0.1% cases respectively which is comparable with the present study.

While use of household poisons (19.5%) and pharmaceutical products (18.7%) was more in Thailand as compared to our study which may be due to fact that this study was undertaken in a rural area so lack of awareness and knowledge about pharmaceutical drugs and household poisons might have played a role for less cases.

But our study was in contrast with Alagozlo H et al study [12] in Turkey which reported that maximum number of cases of poisoning were due to pharmaceutical drugs (54.8%) followed by plant poisons (10.9%).

This may be explained on the basis that the present study is carried out in rural region of India where agriculture sector is the commonest occupation and differences in agricultural practices allows a large number of population (farmers) an easy access to agrochemicals like pesticides in India while only few people in Western countries use agrochemicals like pesticides. As rural agricultural area acts as a habitat for animals like snakes, scorpion and other insects, more number of cases due to animal bites and stings were seen in this study.

In our study out of 557 cases maximum cases were of Organophosphorus insecticides consistent with other studies. [9-11, 15]

These compounds are easily available, commonly used in day-to-day life, economic, ideal for suicide and quick in action.

Sinha US et al [3] in Allahabad, UP observed maximum cases with Aluminium phosphide as Aluminium phosphide is widely used as grain preservative and fumigant in the North India. In contrast to present study Zariwala RC [4] in Ahmedabad, Gujarat observed maximum cases with acid-corrosives. This may be because of that study was carried out in metros where there are various industries.

Snake bites cases were of vasculotoxic snake bite (8.61%); neurotoxic (5.75%) and non-poisonous snake bite (9.87%). The present study was carried out in rural region of India and rural agricultural area acts as a habitat for animals like snakes. Findings of our study regarding the manner of death were consistent with findings of the other studies. [3, 9, 11]

However these authors have found a very high percentage of suicidal poisoning cases in their studies i.e. 89.13%, 92.8% and 87.02% respectively than in present study (50.81%).

This may be due to the fact that present study includes cases of snake bites, scorpion bites (stings) and unknown bites which were excluded by these authors. As these cases were

accidental in nature, this has resulted in lowering the percentage of suicidal poisoning in the present study. Due to the very same reason the percentage of accidental poisoning in the present study was much higher than that reported by above mentioned authors.

Though manner of poisoning decided on the basis of history given by patient, relatives and investigating agencies and inquest, final decision by judiciary is not taken into account. This is a limitation of this study.

Conclusion:

The present study helps to interpret the trends of poisoning in this greenbelt. It is imperative to identify these changing trends in poisoning, as it will immensely help the health policy makers to equip health care institutions accordingly for better management; thereby reducing the mortality.

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