Original Article

Study of trends of poisoning in the cases reported to government hospital, Yavatmal

Abstract

Context: India is a developing country in south Asia. Rural population of this country is mostly dependant on agriculture. Pesticides, mainly the organophosphorus compounds are the most frequently used substances in agriculture and thus are easily accessible. Animal bites such as snake bite, scorpion bites are also common, as people here are mainly involved in the field work. **Aims:** This includes, knowing the pattern of poisoning in India along with various parameters, such as mode of poisoning, type of poison, outcome of the poisoning, the most vulnerable age group involved in poisoning, so that the study will help in rapid clinical diagnosis and immediate treatment of the cases leading to decreased mortality and morbidity. **Setting and design:** Retrospective observational study. **Materials and Methods:** The study was conducted at Govt. Hospital, Yavatmal. Poisoning cases reported to casualty and post-mortem cases of poisoning brought to the hospital from 01/06/2003 to 30/05/2004 were included in the study. **Result:** Total 1003 patients studied; acute poisoning in the age group of 21–30 years was the most common with higher frequency in males. Most common mode was suicidal. Most common agent responsible for poisoning was organophosphorus compounds followed by snake bite. Overall mortality due to poisoning was 12%. It was highest in insecticidal poisoning. **Conclusion:** It was seen that adults between 21 and 30 years of age were more prone to suicidal poisoning with organophosphorous compounds followed by accidental poisoning due to snake bite. Steps are needed to be taken to educate the people, to improve their socioeconomic status and also to provide better treatment facilities at grass root level.

Key words:
Mode of poisoning, organophosphorus poisoning, snake bite

Introduction

India is a developing country of South Asia. Rural population of this country is mostly dependant on agriculture for living. Nowadays, pesticides are being, routinely used for modern cultivation methods. These are readily available as over the counter drugs even in villages. Hence, these are abused as common agents for suicidal purpose after a trivial family problems. Acute poisoning has become a common medical emergency all over the world. Currently, self-poisoning with pesticides has become a major clinical problem of the developing countries[1,2] killing around 300 000 people every year.[3,4] Industrialized countries are also involved in it, where a significant proportion of suicidal deaths are caused by consumption of pesticides.[5,6]

The nature of poisoning varies in different parts of the world and even in the same country depending on the socioeconomic factors and cultural environment. Though poisoning is a universal phenomenon, knowledge of "the pattern of poisoning along with various parameters involved such as mode of poisoning, type of poison, outcome of the poisoning, the most common age group vulnerable to poisoning," will help us in rapid clinical diagnosis and immediate treatment of the cases. It will also help to make the required treatment facilities easily available at every

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place, health education for prevention and for adequate teaching in the institutes of medical education. All this will contribute definitely to decrease the mortality and morbidity due to poisoning in our country.

Materials and Methods

The study was conducted at Govt. Hospital, Yavatmal. It was a retrospective observational study. Poisoning cases reported to casualty and postmortem cases of poisoning brought to the hospital from 01/06/2003 to 30/05/2004 were included in the study.

Patients of poisoning were treated by the physicians. The study procedures did not interfere with the treatment of the patients.

'Ethical Committee Clearance' was taken from institutional ethics committee.

In case of, postmortem cases reported to the hospital, autopsy was performed by the doctors from the Department of Forensic Medicine And Toxicology. Following observations were made:

- Age
- Sex
- Address
- Mode of poisoning
- Nature of poisoning
- Duration of hospital stay
- Treatment given

Last two observations were recorded only in the patients who were treated and discharged.

Statistical analysis

Data collected were entered in the computer in the database and frequency analysis was done using Graph pad prism5 software.

Results and Observations

Total 1003 patients of poisoning were studied. Cases of poisoning were mainly diagnosed by history obtained from the patient himself or the relatives and also the peculiar odor of mouth, clothes, and contents of stomach wash

- Sex wise distribution is shown in Figure 1; male to female ratio was 1.8:1, thus male preponderance 646 (64.4%)
- Maximum number of patients belonged to 21–30 years followed by 11–20 years [Figure 2]
- The youngest patient was 3-year old and the oldest 65-year old
- Majority of the cases (90%) were referred from primary health centre or rural health centre
- Most common agents responsible for poisoning were organophosphorus compounds (35.46%) followed by snake bite (27.32%) [Figure 3]. Major symptoms reported were vomiting (33%) and giddiness (33%). Other symptoms were altered sensorium (8.33%), breathlessness (5%), and convulsions (6.6%). Gastric lavage was performed in all patients who consumed poison orally. The most common mode of treatment in patients of insecticide poisoning included administration of atropine and PAM and antisnake venom in case of snake bite. Other supportive treatment included administration of IVF, antibiotics, analgesics and antacids

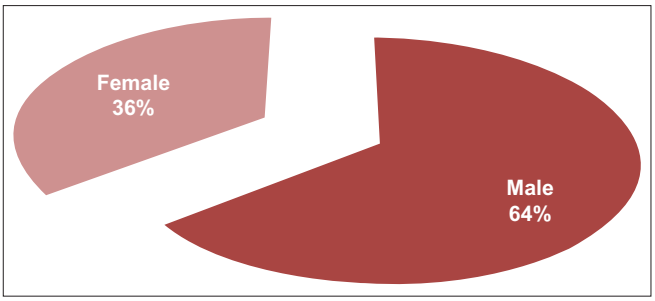

Figure 1: Sexwise distribution (n=1003)

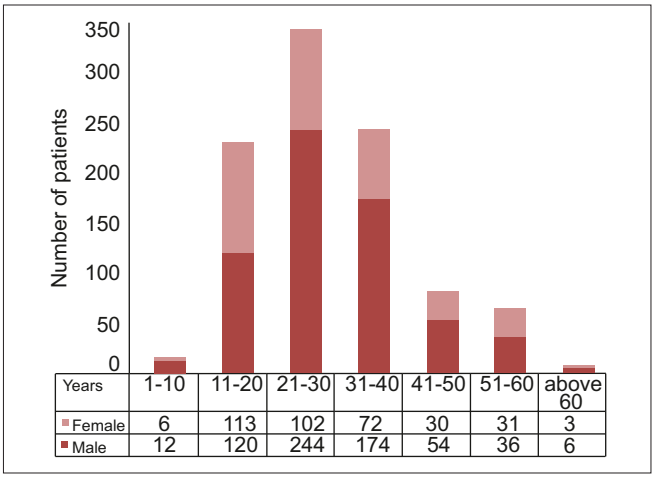

Figure 2: Age and sexwise distribution

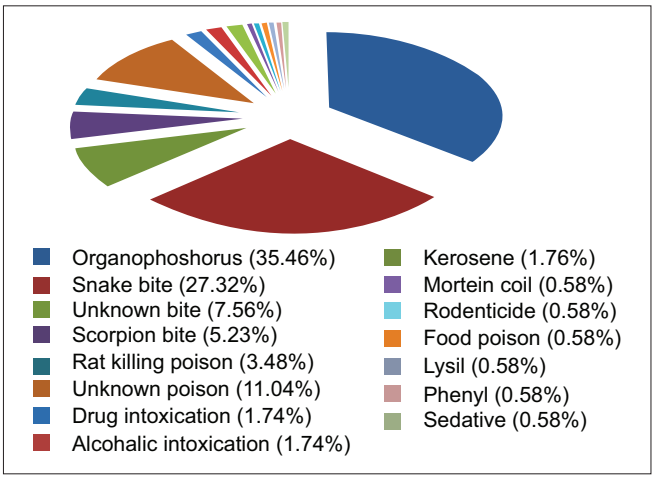

Figure 3: Poisoning due to different type of substances (n=1003)

- Duration of hospital stay varied from 1 to 5 days with minimum duration in case of snake bite and some nonfatal cases, maximum in case of severe insecticide poisoning. Of the total 1003 patients observed, 128 (13%) were discharged against medical advice
- The most common mode of poisoning was suicidal 570 (56.9%) followed by accidental (43.1%) [Figure 4]
- In postmortem cases, total 201 cases were observed. Out of which 164 (82%) were male and 37 (18%) were female. Overall mortality due to poisoning was 20%. Insecticidal agents were mainly responsible for the mortality (51.3%) [Figure 5].

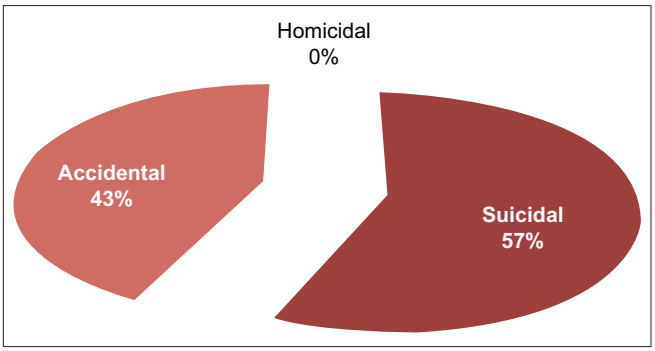

Figure 4: Mode of poisoning (n=1003)

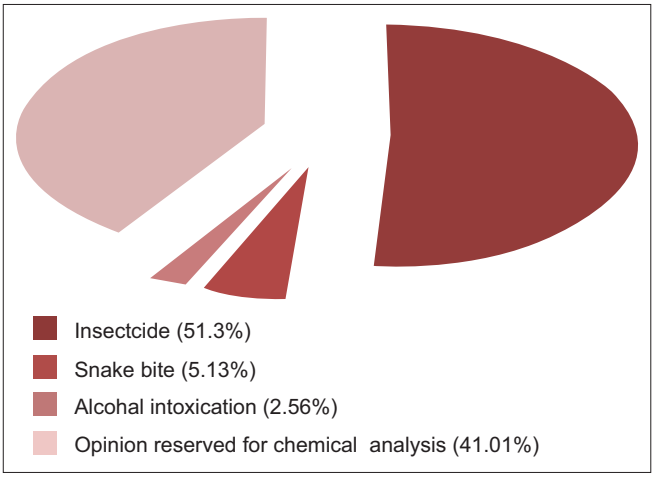

Figure 5: Nature of poisoning in postmortem cases

Discussion

Total 1003 patients of acute poisoning were admitted to Govt. College, Yavatmal during the period of 1st June 2003 to 30th May 2004.

Acute poisoning in the age group of 21–30 years was the most common with higher frequency in males. Similar pattern was shown in studies done in south region,[7-9] Bhopal,[10] Surat,[11] Chandigarh,[12] and Allahabad.[13] Such pattern was also seen in Nepal,[14] Sri Lanka,[15] and Uganda.[16] The high incidence may be because of more involvement of this age group in all types of strain – domestic, educational, and employment related. Male preponderance can be explained by the fact that, males have easy accessibility to the agrochemicals due to more involvement in agricultural work. However, female preponderance was found in Imphal and Maharashtra.[17,18] Same was the case in Zimbabwe[19] and Malaysia.[20]

The most common poison abused was organophosphorus compound (35.46%) followed by the poisoning due to snake bite (27.32%), unknown bite (7.56%), scorpion bite (5.23%), rat killing powder (3%).

Reports available from many parts of the country also denote agrochemicals are the most commonly abused and of the agrochemicals organophosphorus compounds are more commonly encountered agents.[8-10,12,14,21] Similar reports were seen in the study from Asian countries (Sri Lanka[15], Bangladesh[22]), Uganda,[16] Zimbabwe,[19] and Ethiopia.[23] Rao *et al.* in his report found that among pesticides, umonocrotophos and endosulfan accounted for the majority of deaths.[18] However, studies from Malaysia and Oman, therapeutic agents were considered to be mostly responsible for poisoning.[20, 24]

In Yavatmal district, for common people, main source of bread and butter is farming. Thus the agrochemicals are easily available, leading to increased incidence of the insecticidal poisoning. Also Yavatmal region is known to have higher percentage of snakes and main job of the people is in the fields thus the percentage of snake bite is more.

Overall mortality due to poisoning was 20 %. It was highest in insecticidal poisoning (51.3%). The overall mortality rate was 77.6, 28.1, 65 and 6.7% in various studies.[8,10,19,21] Varying incidence may be there, because the morbidity or the mortality in any case of acute poisoning depends on number of factors such as nature of poison, dose consumed, level of available medical facilities and time interval between intake of poison and provision of medical help.

The most common mode of poisoning was suicidal (56.9%) followed by accidental. (43.1%) This may be because of the reasons like economic crisis, examination failure, love failure, quarrels, unemployment, and chronic illness. Similar are the findings of various authors.[9,15,20,21,23] Accidental poisoning specially with kerosene oil was found to be more common in pediatric age group.[14] In our study snake bite was more responsible for accidental poisoning, as this region is having more snakes and population involved more in field work.

Increasing incidence of mortality due to poisoning (either suicidal or accidental) makes it necessary to take some measures, so as to reduce the same. Some of the effective measures to lower the rate of poisoning and to improve the outcome may be as follows:

- Proper training should be provided to doctors and also the paramedical staff. Drugs (antidotes) should be

made available in the govt. hospitals. This has been also suggested by some authors[8,18,21]

- Avoid storing insecticides at home. Advice to store them in the farms under double lock and key. Storage and sale of insecticides should be controlled with stringent legislation and enforcement. A fixed quota as needed per individual should be available through a specialized agency. Some authors had also recommended these guidelines[21,22,25]
- Health education to be given to shopkeepers (selling insecticides), farmers and lay persons. Residual tablets of therapeutic drugs should not be retained at home but should be discarded regularly. Knowledge and awareness about toxic potential of common herbs in rural area and household articles should be given to the lay persons. This was also advised by some authors[22,25-27]
- Murali[12] had recommended integrated pesticide management, development of safer aluminium phosphide formulations, and training of farmers in spraying techniques
- Avoid working in the night especially in the fields in snake-prone regions, use of torch and lathis for self protection should be promoted
- Political commitment: this region is prone for the suicidal tendency in the farmers, so it is duty of our politicians to make every necessary step to improve the condition of the farmers. Better employment opportunities must be provided. Also the agricultural ministry should take steps to keep limitations on the pesticide use, as pesticide cannot be banned totally. These recommendations were also put forward by some authors[18,25]
- Well equipped poison detecting laboratory should be started at medical colleges. Treatment facility at primary health centers, and rural hospitals should be enhanced. Psychiatric counseling must be done in patients who had done suicidal attempt. Sinno *et al*.[28] had recommended preventative strategies like screening adolescents at high risk of self-harm in order to offer adequate counseling, providing anticipatory guidance to their parents. Ahmad[22] had advised further research in organ phosphorus poisoning in Bangladesh. Further research should also be promoted in India as it is causing so much health burden.

Limitations of the study

- In some cases, mode of poisoning could not be reported correctly as these patients tried to conceal the history or gave false information
- Poisonous agent abused by some of the patients was not clearly mentioned by them
- Wrong diagnosis was unavoidable in few such cases due to improper history and overlapping of the symptoms
- In accidental animal bite cases, there was confusion between snake bite and other poisonous insect bite, thus such cases were included in group of unknown bite
- Most of the cases of snake bite reported very late, due to poor transportation facilities and people having more belief over local quacks
- Some patients were discharged against medical advice and some were absconded. Such cases were excluded from study as the outcome was impossible to be traced
- Last, this study was done in the govt. hospital only, we should have included private hospitals also to get a broader view.

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