

Original Research Paper

Retrospective Analysis of Pattern of Poisoning in Uttarakhand

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Abstract

Poisoning cases are important part of medico-legal cases coming to a health care centre. This paper presents the study of cases of poisoning received in the casualty of Himalayan Institute of Medical Sciences, Dehradun during a span of 2 years (2011-2012). The cases were then analysed on various epidemiological parameters, feeding the information in the predesigned Performa prepared for this purpose. It was concluded that there is not much gender difference, however, majority of victims were married and most commonly among people from the age group of 21-30 years. Maximum number of cases took place in the month of November and May. During the span of the study, poisoning due to insecticide were predominant, constituting about 57 percent of all poisoning cases, while poisoning through unknown compounds was the second most common fatal poisoning.

Key Words: Poisoning, Pattern, Uttarakhand, Gender difference, Fatal

Introduction:

Poisoning cases can be deliberate or accidental. Poisons are silent weapons, which can be easily used without violence and often without arousing suspicion.

Modern development in all fields leads to newer poisonous substances and more number of poisoning cases. Advanced medical treatment and awareness cannot wholly control this issue. [1] Poisoning pattern of a region is very crucial in determining the health need of the society and planning the infrastructure and manpower requirement for dealing these cases effectively and efficiently.

This pattern depends on the availability of poisons in that region, occupation, culture, beliefs, demography, socio-economic status, education and customs of the region. Studies of these factors will be useful not only in management of poisoning cases but also identify administrative requirement and help in planning appropriate preventive measures.

In this context the present study was carried out with the objective to investigate the pattern of acute poisoning cases in a tertiary care hospital in Uttarakhand state.

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DOR: 19. 03.2014 DOA: 22.07.2014

Materials and Methods:

The study was conducted as a part of Short Term Research Project at the Himalayan Institute of Medical Sciences. Hospital records of all the patients of all age groups admitted to the hospital during the study period (2011-2012) with diagnosis of poisoning constituted the study material for the retrospective analysis. The cases of food poisoning were excluded from the study. Data was collected in a predesigned case study form.

Observations and Results:

In the present study the Male: Female ratio is 1.2:1 (56 Males and 49 Females). Male outnumbered the females. Poisoning is most common among people from the age group of 21-30 years and then shows a progressive fall as the age progresses with the geriatric age group showing least vulnerability to poisoning.

The poisoning in extreme of ages are least observed. (Fig. 1) Our study clearly showed vulnerability of poisoning among different sections of the population. Married Females are more vulnerable than married males for poisoning. Unmarried Males are at least risk for poisoning. (Fig. 2)

This study showed that Maximum poisoning takes place because of Organophosphates. The second most common cause of poisoning is unknown poisoning. These poisons can be indigenous plant products like Dhatura or other plants or other local products. Drug Overdose is the third most common cause of poisoning. (Fig. 3)

Regarding Route of Poisoning Oral route is the route of choice for suicidal as well as homicidal purpose because of the ease of administration of the poisoning agent and no need for trained personnel to conduct the act. In the present study also the oral route is the most preferred (99%). Inhalational route is usually accidental or homicidal but rarely suicidal. In current study only 1% of total cases are due to inhalational poisoning.

In his study it was observed that Maximum poisoning is attributed to suicidal reasons (89%) with accidental (8%) being the second. Accidental poisoning is prevalent among children as they are vulnerable to consume unknown substances. Homicidal poisoning is still rare and account for only 3% of total. (Fig. 4)

In the present study, in 56% of cases the reason of poisoning couldn't be determined. However, family problems were a leading cause of suicides. It was also observed that conflict with spouse was a major cause of family problems in young age group of 20-30 years.

Moreover, from the age group of 50 and beyond conflict with children was a major cause family problem. Depression was the second leading cause of suicides. The major causes of depression in this region are family problems, financial problems, etc. Substance abuse is the third leading cause of suicides. Substance abuse includes alcohol and drug abuse. (Fig. 5)

Maximum number of cases took place in the month of November and May. In present study, it was observed that gastric lavage is performed as first line of management in 95% cases. However, in 5%cases the gastric lavage has not been done at all. Extensive research has made it possible for us to deal with almost all kinds of poisoning cases resulting in a very low mortality rate. In present study, only 6% mortality was observed because of poisoning. (Fig. 6)

It was observed that maximum cases received help within first 4 hours of ingestion or exposure of poisonous substance.

However, most notable finding was that all cases of deaths were the ones who got their first help within 1-2 hrs. This clearly indicated that apart from the interval between ingestion of poison and first help received outcome of poisoning is also determined by a number of other factors. Moreover, very few but cases are there who received help after 24 hour but then too survived. (Fig. 7)

Discussion:

Many retrospective studies on poisoning pattern were done by various authors of different

parts of India. And they observed and emphasized a strong relationship between social parameters and the pattern of poisoning. The present study also highlights the fact that not only the availability of a poison in a region is a sole determinant but also the social parameters play an important role in pattern of poisoning. Gargi et al observed that male to female ratio was nearly 3:1, majority of the victims were in the age group of 21-30 years (45.59%), and 69.12% were married. [2] Dhanya et al stated that the male: female ration is of 1.27:1 and maximum victims were from the age group 15-30 (58.58%). [3]

Ali et al also found that majority of the cases was young people from the age group 16-40 years (about 80%). [4] The current study has come up with very similar findings i.e. maximum victims were from the age group of 15-30 years. However, the male: female ratio is 1.2:1 and in agreement with Dhanya et al. This age range is a period in which a person is most active in all respects be it family life, professional life, or social life, which increases the stress and often leads to devastating outcomes.

Pokhrel et al found that females were more susceptible to the intentional poisoning than male. Intentional poisoning for unmarried male was found to be more (34%) than for female. On the contrary, intentional poisoning in female was high in case of married subjects (57%). [5] The present study also clearly shows vulnerability of poisoning among married females more than married males. However, unmarried females are also more vulnerable than unmarried male's subjects.

Dhanya et al observed that Organophosphorus (OP) poisoning constitute maximum number of cases (37.25%) followed by unspecified drugs in Calicut. [3] Gupta et al confirmed through chemical analysis report that insecticide was the commonest poison (72.44%) followed by aluminum phosphide (14.28%) and acid (0.63%). [1]

Garg et al reported that Aluminium phosphide is leading cause of poisoning (36.8%) followed by insecticides (31.6%) in South-West Punjab. [6] Gargi et al also reported that Aluminium phosphide (38.23%) followed by Organophosphorus compounds (17.64%) were the commonest poison in Amritsar during 1997-98. [2] However, the present study was in agreement with Dhanya et al and Gupta et al and observed that Organophosphorus poisoning constitute major chunk of total cases (57%) in Uttarakhand region.

It appears that OP poisoning constitutes majority of cases because of easy availability,

low cost, unregulated sale and also presence in majority of households in this region.

Gupta et al emphasized that childhood poisoning constituted 2.1 % of the total paediatric admissions and 1.2% of total deaths. Non-medicinal compounds were the largest contributors (69.2%), of which kerosene alone was responsible for 47% of cases. [7] Singh et al found that in 164 children, poisoning was accidental whereas in 50 it was suicidal and in three homicidal. Routine household items accounted for 27.6% cases with kerosene being the commonest agent. Chemicals, pesticides and fumigants were involved in 35.5% cases. [8]

The present study observes that the contribution of kerosene (2%) in childhood as well as accidental poisoning has gone down. This clearly indicates awareness among parents about the household poisons. However, the childhood poisoning as a result of consuming any unknown substance is still common.

Suicide was the commonest manner of poisoning and many authors made this observation on the basis of history provided by the investigating officers or relatives. Ali et al. in a study on clinical pattern and outcome of OP poisoning showed that suicide is the most common modes of poisoning and reported in 65% cases, followed by accidental (27%) and homicidal (8%). [4]

The current study has also come with a similar pattern in overall poisoning cases i.e. 89% suicidal, 8% accidental and 3% homicidal poisoning. Therefore suicide is still the leading cause of poisoning followed by accidental and homicidal. Many studies including study conducted by Pokhrel et al and Batra et al states that the rainy season is the most common period for suicides among the rural population due to failure of crops. [5, 9] However, the current study couldn't found any increased number of suicides during the rainy season. Moreover, most of the suicides were attributed to family problems and depression, none due to crop failure.

Roberts et al mentioned that use of a poison for a purpose is determined by a number of factors including its easy availability in the market, price and popularity among the masses and appropriate laws concerning the poisonous agent. [10] Nigam et al reported that maximum incidence of OP Poisoning is seen in persons engaged with agricultural fields (39.60 %) followed by house wives (20 %) and students (16.85 %). [11]

The current study is in complete agreement with Roberts et al and found that availability, price and laws influence the use of an agent as a poison to a great extent.

Dhanya et al. mentioned that general measures like Gastric lavage (83%) and Ryles Tube Aspiration (80%) were mainly used for management of poisoning cases. [3] The current study has come up with very similar findings.

Maximum poisoning victims underwent gastric lavage as a general measure. However, remaining 5% cases in which gastric lavage was not at all done include cases of acid ingestion, carbon-monoxide and mercury poisoning. So, Gastric lavage and Ryle's Tube aspiration is still the mainstay of treatment in maximum of cases.

Maiti et al conducted a review study and conclude that use atropine and oximes derivatives in OP poisoning remains conflicting and controversial. They have no effect in moderate and severe poisoning and do more harm than good.

However, Pralidoxime (PAM) is more effective in OP poisoning than atropine. [12] The current study clearly shows that all cases of OP poisoning have been dealt with atropine and PAM and shows good result. So, Atropine and PAM are effective in OP poisoning cases.

Dhanya et al stated that out of the total poisoning cases, 205 patients (10.85%) died of poisoning, of which Organophosphorus poisoning accounted the maximum (88.78% of total mortality). [3] Ali et al graded the Organophosphorus poisoning cases into mild (12%), moderate (60%) and severe (28%) and reported mortality in 20% cases. [4] The present study also showed similar findings. OP poisoning accounted for 57% of poisonings which is the maximum and 6% victims died.

Conclusions:

The present study was a part of Short Term Research to study the pattern of poisoning in the state of Uttarakhand, The Male: Female ratio for poisoning in this region was 1.2:1 and 43% of victims were married. Maximum cases of poisoning came from the age group of 21 – 30 years of age and OP poisoning (57%) is still the leading cause of poisoning in this region followed by drug overdose (10%).

Suicidal poisoning was responsible for 89% of poisoning followed by accidental. Family problems and depression were leading causes of poisoning in this region. Mortality due to poisoning was low with only 6% deaths. General measure for management of poisoning was gastric lavage which was done in 95% of cases.

References:

1. Gupta BD, Vaghela PC. Profile of fatal poisoning in & around Jamnagar, JIAFM, 2005; 27(3), 145-48.
2. Gargi J, Rai H, Chanana A, Raj G, Sharma G, Bagga IJS. Current Trends of Poisoning. A Hospital Profile, J Indian Med Assoc. 2006 Feb; 104(2):72-3, 94.

3. **Dhanya SP, Dhanya T H, Bindu Latha R Nair, Herna C G. A Retrospective Analysis of the Pattern of Poisoning in Patients Admitted to the Medical College Hospital. Calicut Medical Journal 2009; 7(2): 1-8.**
4. **Ali P, Anwer A, Bashir B, Jabeen R, Haroon H, Makki K. Clinical pattern and outcome of Organophosphate poisoning. JLUMHS, 2012; Jan-Apr 11 (1): 15-8.**
5. **Pokhrel D, Pant S, Pradhan A, Mansoor S. A comparative retrospective study of poisoning cases in central, zonal and district hospitals. Kathmandu University Journal of Science Engineering and Technology, 2008; Sep 1(V): 40-8.**
6. **Garg V, Verma S K. Trends of Poisoning in Rural area of South-West, Punjab. J Indian Acad. Forensic Medicine, 2010; 32 (3): 189-93**
7. **Gupta S, Govil Y C, Misra P K, Nath R, Srivastava K L. Trends of poisoning in children: Experience at a large referral teaching hospital, The National Medical Journal of India, 1998; 11 (4), 166-8.**
8. **Singh S, Singh S, Sood NK, Kumar L, Walia BNS. Changing Pattern of childhood poisoning (1970-1989): Experience of a Large North Indian Hospital. Indian Pediatrics, 1995; Mar 32: 331-6**
9. **Batra AK, Keoliya AN, Jadhav GU. Poisoning: An Unnatural Cause of Morbidity and Mortality in Rural India. JAPI, 2003; Oct 51: 955-9.**
10. **Roberts DM, Karunaratna A, Buckley NA, Manuweera G, Sheriff MH, Eddleston M. Influence of pesticide regulation on acute poisoning deaths in Sri Lanka. Bulletin of the World Health Organization, 2003; 81(11): 789-98.**
11. **Nigam M, Jain A K, Dubey B P, Sharma V K. Trends of Organophosphorus Poisoning in Bhopal Region An Autopsy Based Study. JIAFM, 2004; 26 (2): 62-5.**
12. **Maiti PP, Dubey S, Saha P. Study of Various Poisoning: a Review. Indo Global Journal of Pharmaceutical Sciences, 2011; 1(4): 304-14.**

Fig. 1: Age and Sex wise Distribution

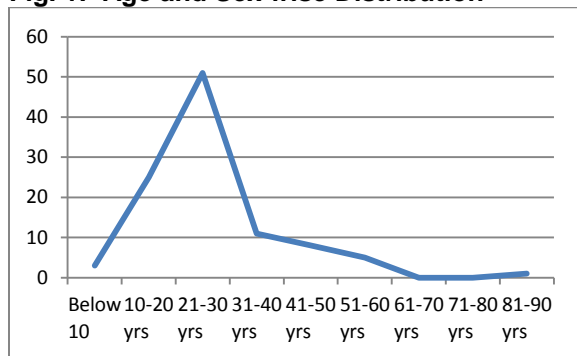


Fig. 2: Marital Status

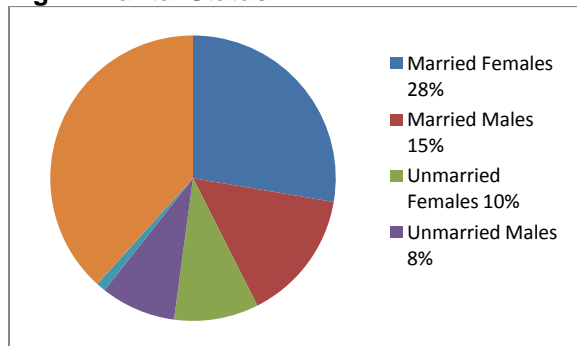


Fig. 3: Type of Poisoning

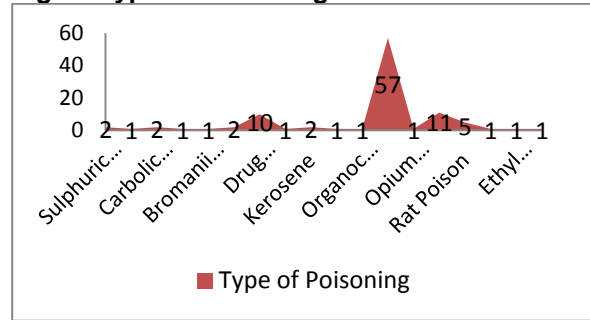


Fig. 4: Manner of Poisoning

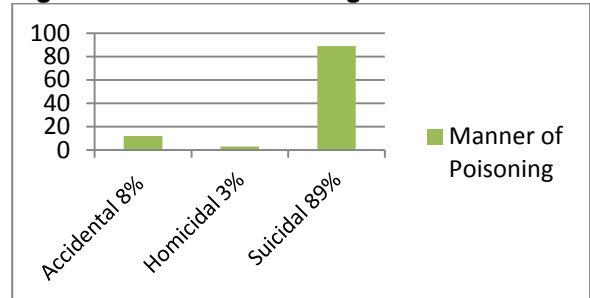


Fig. 5: Cause of Poisoning

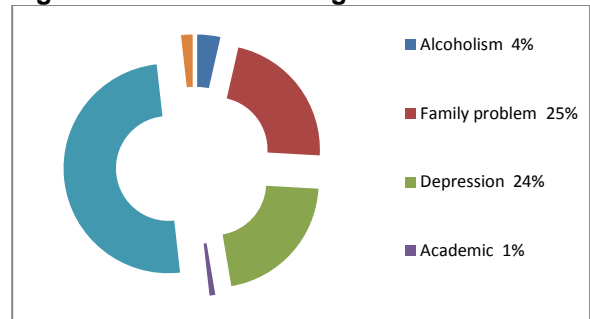


Fig. 6: Prognosis in Cases of Poisoning

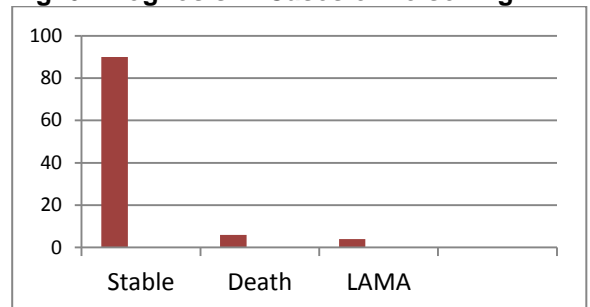


Fig. 7: Interval Between Poisoning and first Help

