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Assessment of poisoning cases in north Indian population

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Abstract
Acute poisoning is exposure to a poison on one occasion or during a short period of time. Symptoms develop in close relation to the degree of exposure. Absorption of a poison is necessary for systemic poisoning (that is, in the blood throughout the body).
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There are about 28 males and 22 females are seen with the poisoning. According to occupations there are 18 workers & 9 farmers are observed with the poisoning. The most of 12 cases of the suicidal attempts are seen with the Aluminum phosphide. The other types of poisoning observed are acid, Delirient, Organophosphate, Rat Poisoning, Sedative etc. The different causes are also recorded in the study group patients. The maximum cases of parent's disputes and family problems were reported. Both males and females are equally involved in the poisoning cases. Other causes includes the marital problems, financial problems, exam failure, love affairs and job loss. The high incidence in case of males may be because they are more exposed to stress and strain due to financial difficulties, loss of job, discord at home and work place, etc.
From the present study it can be concluded that poisoning is mainly reason for the suicidal reason. As agricultural area of North Indian region Aluminium phosphate is commonly available and it is the prominent cause. Hence public awareness of the causes shall be done to minimize the suicidal attempts.

Keywords: poisoning, investigation, hospital

Introduction
Poisoning is injury or death due to swallowing, inhaling, touching or injecting various drugs, chemicals, venoms or gases. Many substances — such as drugs and carbon monoxide — are poisonous only in higher concentrations or dosages. And others — such as cleaners — are dangerous only if ingested. Children are particularly sensitive to even small amounts of certain drugs and chemicals [1].
Poisoning is a condition or a process in which an organism becomes chemically harmed (poisoned) by a toxic substance or venom of an animal [1].
Acute poisoning is exposure to a poison on one occasion or during a short period of time. Symptoms develop in close relation to the degree of exposure. Absorption of a poison is necessary for systemic poisoning (that is, in the blood throughout the body). In contrast, substances that destroy tissue but do not absorb, such as lye, are classified as corrosives rather than poisons. Furthermore, many common household medications are not labelled with skull and crossbones, although they can cause severe illness or even death. In the medical sense, toxicity and poisoning can be caused by less dangerous substances than those legally classified as a poison. Toxicology is the study and practice of the symptoms, mechanisms, diagnosis, and treatment of poisoning.
Chronic poisoning is long-term repeated or continuous exposure to a poison where symptoms do not occur immediately or after each exposure. The patient gradually becomes ill, or becomes ill after a long latent period. Chronic poisoning most commonly occurs following exposure to poisons that bioaccumulate, or are biomagnified, such as mercury, gadolinium, and lead [2].
Inhaled or ingested cyanide, used as a method of execution in gas chambers, almost instantly starves the body of energy by inhibiting the enzymes in mitochondria that make ATP. Intravenous injection of an unnaturally high concentration of potassium chloride, such as in the execution of prisoners in parts of the United States, quickly stops the heart by eliminating the cell potential necessary for muscle contraction. Most biocides, including pesticides, are created to act as poisons to target organisms, although acute or less observable chronic poisoning can also occur in non-target organisms (secondary poisoning), including the humans who apply the biocides and other beneficial organisms. For example, the herbicide 2,4-D imitates the action of a plant hormone, which makes its lethal toxicity specific to plants. Indeed, 2,4-D is not a poison, but classified as "harmful" (EU).
Many substances regarded as poisons are toxic only indirectly, by toxication. An example is "wood alcohol" or methanol, which is not poisonous itself, but is chemically converted to toxic formaldehyde and formic acid in the liver. Many drug molecules are made toxic in the liver, and the genetic variability of certain liver enzymes makes the toxicity of many compounds differ between individuals.
According to the World Health Organization (WHO), 99 per cent of the fatal poisoning cases occur in developing countries, predominantly among the farmers due to various kinds of poisoning, including poisonous toxins from natural products during handling [3-5]. Therefore, early diagnosis, treatment and prevention are crucial in reducing the burden of poisoning related injury in any country. Very few studies have been done in North India regarding the epidemiology of poisoning as compared to South India. So, this study has been aimed to determine the various parameters of poisoning.

Methodology

The study has planned in North Indian Hospital. The 50patientsof different poisoning were enrolled in to the study. The age group of the patients are from 30-70 years. The emergency patients visited to a tertiary care hospital in North India were considered in the study. All the patients are informed consents. The entire patient's clinical histories were collected. The approval of the institutional ethical committee is taken for the planned study.

Table 1: Age & Sex of the patients

Age Group	Males	Females
Less than 20 years	6	2
21-30	7	3
31-40	4	5
41-50	5	7
More than 50 years	6	5
Total	28	22

There are about 28 males and 22 females are seen with the poisoning. According to occupations there are 18 workers & 9 farmers are observed with the poisoning. The most of 12 cases of the suicidal attempts are seen with the Aluminum phosphide. The other types of poisoning observed are acid, Delirient, Organophosphate, Rat Poisoning, Sedative etc.The different causes are also recorded in the study group patients. The maximum cases of parents disputes and family problems were reported. Both males and females are equally involved in the poisoning cases. Other causes includes the marital problems, financial problems, exam failure, love affairs and job loss.The high incidence in case of males may be because they are more exposed to stress and strain due to financial difficulties, loss of job, discord at home and work place, etc.

Table 2: Patients according to the occupations

Occupations	Cases
Farmer	9
Workers	18
Businessman	6
Housewife	7
Students	3
Unemployed	7
Total	50

Table 3: Type & Mode of Poisoning

Type of Poisoning	Mode of Poisoning		
	Accidental	Homicidal	Suicidal
Acid	2	-	1
Aluminum phosphide (Pesticide)	-	3	12
Delirient	1	-	2
Organophosphate	1	-	5
Rat Poisoning	3	1	6
Sedative	2	-	5
Unknown	-	-	6
Total	9	4	37

Table 4: Patients According to Marital Class

Sex	Married	Unmarried
Male	20	8
Female	15	7
Total	35	15

Table 5: Distribution as per Cause\

Cause	Number of Cases
Marital Problems	7
Financial Problems	4
Exam Failure	6
Family Problems	7
Parents disputes	12
Love Affairs	6
Job Loss	4
Other	4
Total	50

Suicide was the most common mode of poisoning in this study and is comparable toother studies [6] and suggests that suicide by using poisons has increased becauseof their easy availability in the market and also there is a general belief that poisonterminates life with minimal suffering [19,20]. Aluminium phosphide was the most commontype of poison consumed for both homicidal and suicidal purposes. Studies from otherparts of India have reported organophosphates2 and other pesticides3 as commoncauses of poisoning. Recently, there has been an increasing trend in the incidenceof aluminium phosphide poisoning in North India, may be due to its easy availability, absence of specifc antidote and high fatality rate. In an earlier study, aluminiumphosphide was found to be the most common cause of acute poisoning in India [7].Overall mortality in the present study was 14.4 per cent. This finding is similar to thereported mortality rates in some other Indian studies [8, 9]. Most of the cases ofpoisoning belonged to the middle and low socio-economic group signifying the fact thatfinancial and social problems may have an important bearing in the daily lives of thesegroups. Based on the predominant agricultural background of the studypopulation, asignificant use of insecticides and rodenticides as poisons is not unusual in both urbanand rural set ups. Poisoning was more common in the married group irrespective ofthe sex. This is consistent with studies from Orissa [10] and Chandigarh [11], and showsthat married persons may become victims of greater stress than single individualsin their day-to-day lives. The different causes of the stress culminating in poisoningranged widely from marital and family discords to financial and job related problems toeducational and other matters.

Conclusion

From the present study it can be concluded that poisoning is mainly reason for the suicidal reason. As agricultural area of North Indian region Aluminium phosphate is commonly available and it is the prominent cause. Hence public awareness of the causes shall be done to minimize the suicidal attempts.

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