Original Research Paper

Trends of Poisoning in a Tertiary Care Centre of North West Uttar Pradesh

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Abstract

Poisoning cases account for a considerable proportion of all the cases reported to both government and private sector casualty departments and causes considerable morbidity and mortality due to low cost and easy availability of poisons. The present study evaluates the pattern of poisoning at a tertiary care hospital in Bareilly city of North West U.P. A retrospective and prospective analysis of all poisoning cases reported to the emergency department of SRMS-IMS from Jan 2010 to Dec 2012 was done to study the pattern of poisoning. Data were collected and analyzed. A total of 178 patients (male: 100, female: 78) were included in the study. The male female ratio was 1.28:1. The types of poisons were insecticides like Organophosphorus compound, halogenated insecticides, rodenticides, petroleum products, corrosive substance, snake bite, Dhatura etc. Most of the victims (75.28%) were Hindu. Most common age group reported was between 21-30 years. Most of the cases were from summer months, which happen to be the harvesting and selling season for farmers. Fatal outcome was observed in 16.29% cases. Recent trends in our study showed that cases of unknown poisoning are on rise possibly due to industrial chemicals.

Key Words: Poisoning trends, Organophosphorus, Insecticides, Casualty, Mortality

Introduction:

History of poisoning dates back to before 4500 BC. Through this long journey art and science of poisoning have undergone tremendous changes. In Indian context history shows that poisons were not only known but were also used to destroy enemies and get rid of prisoners. Indian surgeon Sushruta is said to have defined the various stages of slow poisoning and the treatment of slow poisoning. He also mentions antidotes and the use of traditional substances to counter the effects of poisoning. [1]

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Poisoned weapons were used in ancient India [2] and war tactics in ancient India have references to poison. A verse in Sanskrit reads "*Jalam visravayet sarmavamavisravyam ca dusayet*," which translates to "Waters of wells were to be mixed with poison and thus polluted." [2] Chanakya (350–283 BC) was adviser of first Maurya Emperor Chandragupta (c. 340–293 BC). He suggested employing means such as seduction, secret use of weapons, and poison for political gain. [3]

He also urged detailed precautions against assassination—tasters for food and elaborate ways to detect poison. [4]

At Present over 11 million chemical substances are known and some 60,000 to 70,000 are in regular use. Between 200 and 1000 chemicals are produced in excess of one ton annually. Currently new chemicals are entering the market at the rate of about 600 each month (or over 7000 per year). [5]

Before human started making new chemical substances, they were exposed to poisonous plants, venomous animals, and chemicals of natural origin. With the onset of mining and smelting of minerals, workers were exposed to fumes and dusts.

Poisoning occurred in early civilizations through the use of lead and mercury. However, the rapid industrialization of the last century, the increasing numbers and volume of chemicals

produced in this century, and the growing global market in chemicals of the recent decades has accelerated dramatically the range of chemicals and types of exposure experienced by individuals and populations.

Worldwide, an estimated three million cases of pesticide poisoning occur every year, resulting in an excess of 250000 deaths. Of these 90% of fatal poisoning occur in developing countries particularly amongst agricultural workers. [6]

Intentional and unintentional pesticide poisoning has been acknowledged as a serious problem in many agricultural communities of low- and middle-income countries, including China, India, Sri Lanka, and Vietnam.

An estimated total of 877000 people committed suicide worldwide in 2002 and around 28% of these cases *i.e.* 246000 are from south East Asia region (SEAR). [7]Globally around one third of all suicide cases are due to intentional pesticide ingestion. Use of pesticide ingestion for self-poisoning occurs mostly in rural areas of middle and low income countries.

Deaths from pesticide ingestion are major contributor to premature mortality and global burden of suicide. In developed countries medicines are most common source of self-poisoning with fatality rate of <1% but in developing countries pesticides are major source with at least ten times higher fatality.

In attempted suicide, which is considerably more frequent than completed suicide, pesticide poisoning results in temporary or permanent disability. Pattern of poisoning in a particular region depend on factors like availability, socioeconomic status, religious and cultural influences and availability of drugs.

The commonest cause of poisoning in India is pesticides due to easy availability, agriculture based economy and poverty. In developing countries like India occupational poisoning is common due to illiteracy, unsafe practices like storing the pesticide at home and handling them without safety gear. [8]

WHO and other humanitarian organizations are coercing the authorities of different countries to ban the highly toxic pesticides and also imposing restrictions to their access. Controlling access to pesticides is not only critical in reducing self-directed violence, it is key to preventing unintentional poisoning and terrorism. International conventions attempt to manage hazardous substances; however, many highly toxic pesticides are still widely used.

Studies indicate that bans must be accompanied by evaluations of agricultural needs and replacement with low-risk alternatives for pest control. [6]

A lot of studies have been done on same subject of poisoning under different names in different regions of our country but due to lack of a central agency there is no consolidated database. Globally, there is a scarcity of information on the magnitude of both intentional and unintentional poisoning, as well as on the relative importance of different pesticides.

The detailed and accurate community-based data on the pesticides responsible for fatal self-harm are not available, from most of rural Asia. [9] Present study is a small effort to provide some information from this part of North West Uttar Pradesh.

Materials and Methods:

The present study was conducted in Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly, a tertiary care super specialty teaching hospital from 1st Jan 2010 to 31st December 2012. During this period a total of 178 cases of poisoning were reported to casualty department. This study was a retrospective and prospective study.

Cases from 1st Jan 2010 to 30 Sept 2011 were studied retrospectively from case files of record room and prospectively from 1st Oct 2011 to 31st December 2012. In prospective study relevant data was collected from relatives accompanying the patient, casualty medical officer, treating doctor and from case file.

Data related to name, age sex, religion, marital status, economic status, type of poison ingested, mode of ingestion, was collected in standardized proforma specially designed for the purpose and analyzed.

Observations and Results:

During our study period one hundred and seventy eight cases were admitted to the Hospital with diagnosis of acute poisoning. Males were more prone to poisoning (56.2%) as compared to females (43.8%). (Table 1)

The incidence of poisoning according to age and sex (Table 2) revealed that there was an increasing trend of poisoning with increase in age up to 30 years and then declined with a peak incidence in the age group 21–30 years which represented 85 (47.8%) cases in this study.In present study incidence of poisoning was more in Hindu people (75.3%) followed by Muslims (19.7%) and 5.1% cases comprised of others which included Sikhs and Christians. (Fig. 1)Among the 178 cases admitted to the hospital with diagnosis of acute poisoning 105 (59%) cases were married. (Fig. 2))

Out of married cases 65 were male and 40 were female. Out of total 73 (41%) unmarried cases, 35 were male and 38 were female.

In our study maximum incidences of poisoning were recorded in summer season. (Table 3) The poisons used were organophosphate and other insecticides (Organochlorine) (41%), Celphos(23%) and liquids like kerosene in 2.81%. (Table 4)

Organophosphorus poisons are the most commonly abused poison followed by Aluminium phosphide. (Table 4) In this study out of total 178 cases of acute poisoning cases 29 admitted (16.29%) cases died during the treatment and 149 (83.71%) cases survived the acute poisoning. (Fig. 3)

Discussion:

Poisoning cases, pesticide poisoning in particular, impose a huge burden on the economy in developing countries. Non-fatal cases of self-poisoning with insecticide also place burden on already stretched health care resources of low and medium income countries like India because many cases require ventilation for several days and transport to specialist hospitals because they cannot be managed in small rural hospitals.

In 1995–96, 41% of intensive care beds in a Sri Lankan hospital were occupied by people poisoned by organophosphates. The overall estimated cost of treating self-poisoning cases in Sri Lanka in 2004 was about $1 million.

According to a study from India it is found that around 27% of pesticide poisoning cases require ventilation for varying periods. [10]

Most of the times pesticide and celphos poisoning is due to impulsive act of self-harm.

At any rate, it is known that the pesticides that cause most deaths in rural Asia, and in the world, are WHO Class I and II Organophosphorus pesticides causing an estimated 200,000 deaths. [11-13]

The present study shows that most of the cases belong to the age between 21 to 30 years which constitute 47.8% followed by age group 31 to 40 years which constitute 18% of the total cases. This observation is consistent with the other studies. [14-20]

In this study it has been observed that there is decreasing trend of poisoning cases after the peak of 21-30 years and it is least in extremes of life. Further it has been observed in the present study that most of the cases are due to organophosphate and other insecticide poisoning. This is in accordance with the other authors studies. [11-14, 16-19]

The present study showed that around 75% victims were Hindus. This data is consistent with other observations. [14, 15, 18] Out of total 178 cases studied 100(56.2%) were male and 78(43.8%) were female which is consistent with other studies. [14-16, 18-20]

It is worth noting that most of the cases occurred in summer months from our study. This finding is similar to other studies. [16, 19] In the present study 105 (58%) cases were found to be married and around 73 (42%) were unmarried this is consistent with other studies. [14, 15, 18, 19]As far as data on mortality is concerned not many studies have taken this aspect into consideration plus many are autopsy based studies. In our study mortality of 29 cases (16.29%) differs with other studies with varying mortality percentage. [14, 16, 17]

Conclusion:

Many studies have been conducted on fatal/nonfatal poisoning, deliberate self-poisoning and accidental poisoning.

Most of the studies stress on the fact that most of cases of poisoning are self-harm types *i.e.* suicidal in nature. Though this fact has not been accounted for in this paper but this is a constant fact in all studies.

Authentic data on poisoning not only from India but from entire SEAR (South East Asia Region) is lacking and WHO states that many cases go unnoticed and mortality may actually be higher.

Pesticides again are clear culprit in most of cases. So to cut short it may be stated that self-harm pesticide poisoning is most common type of poisoning which is more common in Hindu and most of the cases are from age group 21-30 years.

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Table1: Gender Distribution

Gender	Cases	%age
Male	100	56.18
Female	78	43.82
Total	**178**	**100**

Table 2: Age and sex wise Distribution of Poisoning Cases

Age Grp (Yrs)	Cases	Male	Female	Total (%)
0-10	10	5	5	5.62
11-20	20	10	10	11.24
21-30	85	47	38	47.75
31-40	32	17	15	17.98
41-50	19	12	7	10.67
51-60	5	3	2	2.81
61-70	5	4	1	2.81
71-80	2	2	0	1.12
Total	**178**	**100**	**78**	**100**

Table 3: Month & Year Wise Distribution of Cases

Months	Year-2010	Year-2011	Year-2012
January	0	5	6
February	6	3	6
March	2	5	3
April	3	6	9
May	6	10	10
June	6	7	6
July	2	4	8
August	5	3	8
September	1	3	6
October	2	3	5
November	5	9	3
December	3	1	8

Table 4: Types of Poison

Poison	Cases	%age
Organophosphorus	44	24.72
Celphos	41	23.03
Unknown	34	19.10
other insecticides	29	16.3
Snake bite	8	04.49
Corrosives	7	03.93
Alcohol	5	02.81
Kerosene	5	02.81
Dhatura	5	02.81
Total	**178**	**100**

Fig. 1: Religion wise Distribution

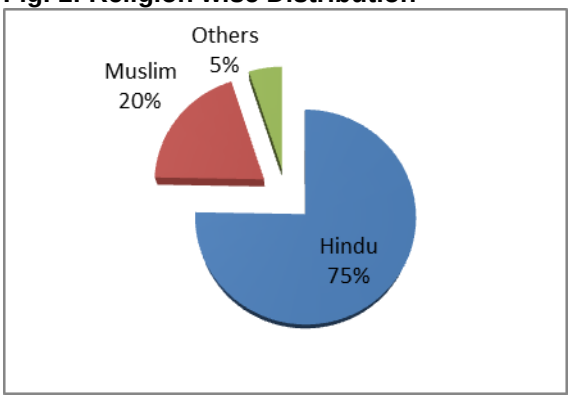

Fig. 2: Marital Status of Poisoning Cases

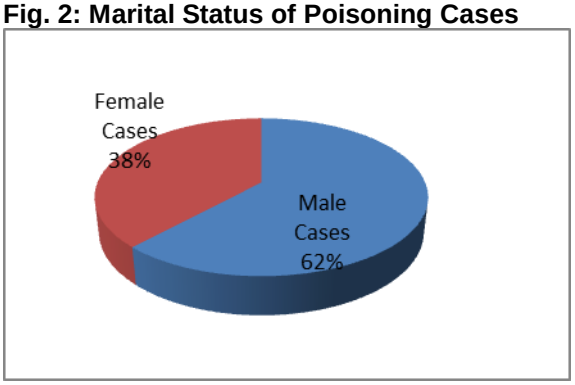

Fig. 3: Outcome of the Patient