

## Original Research Paper

# Trends of Poisoning in Western Utter Pradesh A Clinico-pathological Study

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### Abstract

Drugs and chemicals are a great danger to human lives but most of the poisoning in our country is due to pesticides and insecticides. In this paper the cases of poisoning admitted in Subharti Hospital Meerut were studied for epidemiological, clinico-pathological and medico-legal aspects. Majority of the poisoning victims are young adults, Hindus between 16-35 years of age with preponderance of Male (61.11%) over female (38.88%). Most of the victims belonged to lower or lower-middle class. Pesticides especially Aluminium phosphide (31.74%) and organophosphates (20.63%) are responsible for more than two-third (72.22%) of the casualties. Nausea & vomiting was the most common symptom seen in 41.26% patients followed by altered consciousness (39.68%) and burning pain in abdomen (21.42%). Majority of poisoning cases (82.53%) were suggestive of suicide, of which family quarrel (36.54%) and unemployment or loss in business (14.42%) were more common in male and ill treatment by husband/in-laws (13.46%) in female.

**Key Words:** Poison, Pesticide & insecticide, Nausea & vomiting, Constricted pupil, Suicidal

### Introduction:

Poison is a substance which has deleterious effect on living organisms produces ill health or death by direct contact or by absorption in the body. With advancement in science and technology large number of harmful chemicals especially insecticides and pesticides are invented to protect farming. But now they become a serious threat to human lives. [1]

The cases of poisoning by Corrosives, Sedatives & hypnotics, Alcohol, Dhatura, Oleanders, Snake bite etc. are also frequently reported in adults and by Kerosene and cleaning agents in children. [9]

Meerut though an agriculture dominant belt of western Utter Pradesh, its geographical proximity to National Capital Region Delhi exposes youths to higher living standards and western culture including consumption of alcohol and other intoxicating drugs. This all forces them sometimes to take hasty decision to end their lives.

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So this study was undertaken to find out the trend of poisoning and effect of modern treatment on its morbidity and mortality.

### Material and Methods:

All the cases of poisoning including alcohol intoxication admitted in the Chatrapati Shivaji Subharti Hospital Meerut from 1<sup>st</sup> September 2011 to 31<sup>st</sup> May 2013 were studied for their epidemiological, clinico-pathological and medico-legal aspects.

Various epidemiological details including age, sex, religion, education, socioeconomic status etc. and data regarding mental status, personal habit, type & amount of poison consumed, early symptoms, duration of their appearance and reason behind intake etc. were collected from the patient, relatives, friends and other accompanying persons.

The general condition of patient including pulse, blood pressure, respiration, level of consciousness, pupillary condition, cyanosis, gait, speech, coordination etc. were noted after examination in collaboration with the residents of Department of Medicine and investigations & treatment from the hospital records. Attempt is also made to collect information from police records and news items from reputed news papers.

All the information of every case was recorded carefully on format and analyzed & presented in tables, bar and pie diagrams in result.

## Observation and Results:

### Epidemiological Profile

The present study was carried out in 126 patients of poisoning admitted in C.S.S. Hospital Meerut from 1<sup>st</sup> September 2011 to 30<sup>th</sup> May 2013. Two-third (65.86%) of the poisoning patients in this study were between 10-30 yrs of age, equally distributed between 11-20 (32.53%) and 21-30 (33.33 %) years of age group, followed by 31-40(15.87 %) and 41-50 (8.73&) years. (Table 1)

Gender-wise males (61.11%) were more in comparison to female (38.88%). Preponderance of male over female was observed in almost all the age groups except in 11-20 and above 50 years of age where proportion of female was little higher. Majority of the poisoning victims were not only young but unmarried (57.14 %) too. 41.26% of the cases were married and one (0.70%) was divorcee.

As to the religious faith, Hindus were more frequent (91.26%) victims of the poisoning as per their share in population. Poisoning cases were comparatively less in Muslims (7.93%) and Sikhs (0.79%) communities.

Most of the cases (88.89%) of poisoning were literate, educated up to higher secondary in 45.23% and graduate in 19.84% of the total cases but this education was not sufficient to get desired employment.

The only professionally qualified case in this study was an engineer, who has committed suicide due to unemployment by taking Ketamine, an anaesthetic drug used in rave parties. Majority of poisoning cases were from lower socio-economic status, of which 46.82% from lower middle and 40.47% from lower income group.

They were also from a joint (58.73%) or from a nuclear (36.5%) family and dependent on their parents/in-laws in majority (60.30%) of the cases, of which 20.63% of the patients were either unemployed or school/college going and 19.04% were housewives. Only 13.49% were farmer, 12.69% in service and 7.93% running small business shop. (Table 2)

Pesticides and insecticides was the most common (72.22%) source of poisoning, of which Aluminium phosphide (AIP- 31.74%) and Organophosphates (OP- 20.63%) were the commonest. The cases of other pesticides such as Cypermethrin, a mosquito repellent (5.55%) Organo-chlorines (4.76%) & Rat poisons (5.55%) Endosulphan, Ethylene Di Bromide Paraquat, Thiocarbamate etc. were also reported in few cases. (Fig.1)

Poisoning by Caustic Soda, Benzodiazepine, Oleander (*Cerbera thevetia*) etc. were also seen but exact nature of poison could not be ascertained in 17.46% cases.

All most all (99.2%) the poisons were taken orally in this study except in one case where the dead body was found in a tanker; probably the victim inhaled petroleum vapour during cleaning.

### Clinico-Pathological Features:

Though nausea and vomiting, burning pain in abdomen and uneasiness was the first symptom complained by the patients in 41.26%, 21.42% & 18.25% cases respectively but the common presentation in hospital was altered consciousness in 39.68%, dilated pupil in 35.71%, constricted pupil in 30.15%, flushed skin in 17.46% and slurred speech in 13.49% cases of poisoning. (Table 3)

Though dilated pupils were observed in more than one-third of the cases but most of them were treated with atropine as antidote by first attending physician irrespective of knowing the nature of the poison.

Signs & symptoms and treatment depend more or less on individual poisoning. In a comparative study of two most common poisonings i.e. Organo-phosphate & Aluminium phosphide, though nausea & vomiting are common in both the cases, Kerosene like smell (53.84%), constricted pupil (88.46%), abdominal cramps (46.15%) and increased salivation (34.61%) was more common in OP.

While garlicky odour (30%), breathlessness (80%), palpitation (72.5%), burning epigastric pain (67.5%) and diarrhoea (47.5%) are common in AIP poisoning. (Table 4)

Gastric lavage (93.65%) and activated charcoal (84.12%) was administered in almost all the cases irrespective of the nature and type of poison. The management differs in terms of antidotes as Atropine alone or with Pralidoxime was used in 96.15% cases of OP poisoning and MgSO<sub>4</sub>, though not an antidote, was given in 87.5% cases of AIP and the life of 88.09% of the patients were saved. The Mortality rate was higher (25%) in AIP poisoning as compared to OP (15.38%). (Table 5)

### Medico-legal Aspects:

Majority of the poisoning cases (82.53%) were suicidal in nature, of which Family quarrel & unhappiness (36.54%) and Unemployment or loss in business (14.42%) in male and Ill treatment by husband/in laws (13.46%) in female are the prime motives behind committing suicide. (Fig. 2)

Accidental cases were 12.69% where poison was taken mainly by mistake. Homicidal

intention was observed in six (4.76%) cases; all were children below 6 years, killed by their parents those have committed suicide after giving poison (altruistic filicide).

### Discussion:

Most of the cases of poisoning in this study were young adult males between 16-35 yrs of age and majority of them were unmarried dependant on their families. It was also observed that most of the poisonings cases were suicidal in nature. This indicates that young men those had just encountered with the hardships of life and if they failed to achieve the goal, take poison to commit suicide.

Similar results were also seen other parts of the county. [4, 6] The poisonings in children below 12 years were either accidental or forced to drink poison by their parents in love because they had decided to end their lives and did not want to leave their children as orphan.

In this study only 13.49% were farmers, as against higher number reported in other parts of country. [3, 5] However, in a study in rural areas of Punjab, farmers were only 12.82% of all poisoning cases, supporting the hypothesis that where farmers are in better financial condition, incidence of suicidal poisoning is less. [10] This is also true with Meerut.

Pesticides were the main source of poisoning in majority (69%) of the cases because these are easily available, cheap and highly toxic. Aluminium phosphide and organophosphate are the two commonest pesticides whose poisonings are prevalent throughout the country. In some regions Aluminium phosphide is the commonest [2] while organophosphate in other places. [3, 11]

Mosquito repellents such as All-out, Mortein, Good-Night etc. are commonly used in urban regions, ingested impulsively by younger students for the same region. Nausea and vomiting was the most common symptom seen in 41.26% cases just after taking meal/drink by a healthy person.

Apart from nausea, vomiting & burning pain in abdomen, altered consciousness, constricted pupil, flushed skin & slurred speech were also seen in large number of cases. But these features vary in individual poisoning.

In comparison of the symptoms of poisoning due to Aluminium Phosphide & Organophosphates, though gastrointestinal symptoms were seen in both; restlessness, burning pain in abdomen & diarrhoea were more common with AIP poisoning and constricted pupil, increased salivation & kerosene like smell in OP poisoning.

Gastric lavage, activated charcoal and atropine with/without Oximes were given in OP & OC poisoning. Only 15% of the patients died probably they brought to the hospital late in low condition. Though there is no specific antidote of AIP, MgSO<sub>4</sub> was given and most of them responded well. About 25% of the cases died in this study, mostly due to cardiac complications.

Majority (82.53%) of the poisoning cases are suicidal. Similar results were also observed in a study in Saurashtra Region of Gujarat, in which suicidal cases were as high as 92.8% of the total poisonings. [7]

Such type of scenario was also observed in other parts of country. [3, 10] Family quarrel and marital unhappiness was the most common reason behind committing suicide in married person, probably due to unemployment or inability to bear the responsibility of family which forces them to end their lives.

Ill treatment by husband &/or in-laws was one of the main reason in females. It indicates that in spite of widespread efforts to reduce domestic violence against women, problems related to dowry & child marriage are still exist in the society. Similar results were also observed by Patel in Jagdalpur. [8]

Poverty especially indebtedness is also an important reason behind committing suicide seen in 9.62% cases. In two tragic incidents all the members of family tried to end their lives by taking poison.

### Conclusion:

In our study majority of the cases of poisoning (72.22%) were young adults between 16-35 years of age and males (61.11%) predominated over females (38.89%).

Male female ratio was 1.57:1. Most of the patients belonged to poor socioeconomic status and lived in a joint/nuclear family structure. More than half of the cases (57.14%) were unmarried either school going or unemployed. Pesticides were the main source of poisoning (69%) of which Aluminium Phosphide and Organophosphates are the commonest.

Most of the poisoning cases are suicidal (82.55%) and family quarrel & unhappiness (34.54%) & unemployment or loss in business (14.42%) were the prime motives in males and ill treatment by husband &/or in laws (13.46%) in females.

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**Table 1: Age & Gender Wise Distribution of Poisoning Cases**

Age group (yrs)	Male (%)	Female (%)	Total (%)
<10	05 (3.96)	05 (3.96)	10 (7.93)
11-20	20 (15.87)	21 (16.66)	41 (32.53)
21-30	31 (24.6)	11 (8.73)	42 (33.33)
31-40	11 (8.73)	09 (7.14)	20 (15.87)
41-50	10 (7.93)	01 (0.79)	11 (8.73)
>50	0 (0)	02 (1.58)	02 (1.58)
Total	77 (61.11)	49 (38.88)	126 (100)

**Table 2: Occupation of Poisoning Cases**

Occupation	Cases (%)
Agriculture	17 (13.49)
Businessman	10 (7.93)
Housewife	24 (19.04)
Labourer	02 (1.58)
School/College going	26 (20.63)
Service	16 (12.69)
Unemployed	26 (20.63)
Professional	01 (0.79)
Any other	04 (3.17)
Total	126 (100)

**Table 3: Common Symptoms on Hospital Admission (n=126)**

Symptom	Cases (%)
Altered consciousness	50 (39.68)
Slurred speech	17 (13.49)
Altered gait	12 (9.52)
Constricted pupil	38 (30.15)
Dilated pupil	45 (35.71)
Flushed skin	22 (17.46)

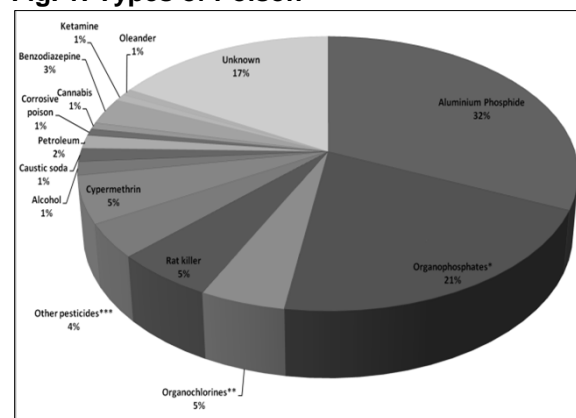
**Table 4: Comparison between Clinical Features of OP & AIP Poisoning**

Clinical Features	AIP cases (%) (n=40)	OP cases (%) (n=26)
Garlicky odour	12 (30)	0 (0)
Kerosene Like odour	0 (0)	14 (53.84)
Nausea and Vomiting	38 (95)	22 (85.02)
Diarrhoea	19 (47.5)	06 (23.07)
Pain in Abdomen	27 (68.5)	12 (46.15)
Increased secretion	04 (10)	09 (34.61)
Breathlessness	32 (80)	09 (34.61)
Palpitation	29 (72.5)	02 (7.69)
Convulsions & Fasciculation	0 (0)	02 (7.69)
Restlessness	38 (95)	12 (46.15)

**Table 5: Comparison between Treatment and Prognosis of OP & AIP Poisonings**

Treatment & Prognosis	AIP (40)	OP (26)
	Cases (%)	Cases (%)
Gastric lavage	38 (95)	22 (84.61)
Activated charcoal	37 (92.5)	23 (88.46)
MgSO <sub>4</sub>	34 (87.5)	00 (0)
Atropine	00 (0)	05 (19.23)
Atropine+ Pralidoxime	00 (0)	20 (76.92)
Death	10 (25)	04 (15.38)

**Fig. 1: Types of Poison**



**Fig. 2: Apparent Motive of Suicide in Poisoning Cases**

