

# Clinical profile of patients of nonorganophosphate and nonorganochlorine compounds poisoning

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## Abstract

**Objectives:** 1) To study the clinical profile of patients of nonorganophosphate and nonorganochlorine compounds poisoning. 2) To study the clinical manifestations and outcome of different poisonings. **Material and methods:** Patients of nonorganophosphate and nonorganochlorine compounds poisoning admitted over 24 months in a tertiary care hospital were studied for clinical profile and outcome. **Results:** Among 155 patients, 37.4% of patients were between 3rd and 4th decade and 29.03% of patients were between 1st and 2nd decade. Eighty-one patients were male and 74 were females. There was no significant difference according to gender ( $p = 0.838$ ). About 92.09% were due to suicidal intention and 5.16 were accidental in nature; 1.93% occurred under the influence of alcohol. The route of exposure was oral in all patients (100%). About 26.45% were manual laborers, 23.87% were housewives, 21.29% were farmers and 18.06% were students. Most common poisoning was rodenticide poisoning (49.03%); 6.38% patients (13) died ( $p = 0.822$ ). **Conclusions:** There was no significant gender difference. The route of exposure was oral in all. The most common poisoning was rodenticide poisoning. The most common intention was suicidal and most patients survived.

**Key Words:** Organophosphate, organochlorine, oral, suicidal, rodenticide.

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## INTRODUCTION

Poison is a substance that causes damage or injury to the body and endangers one's life due to its exposure by means of ingestion, inhalation, or contact.<sup>1</sup> Worldwide various agents such as agrochemicals, drugs or environmental agents are used as poisoning agents.<sup>2</sup> Worldwide intentional poisoning is one of the important causes for mortality and morbidity.<sup>3</sup> World Health Organization (WHO) estimated 0.3 million people die every year due to various poisoning agents.<sup>4</sup> According to

World Health Organization (WHO), globally more than three million of acute poisoning cases with 2, 20,000 deaths occur annually.<sup>5</sup> It has been estimated that, in India five to six persons per lakh of population die due to acute poisoning every year.<sup>6</sup> Poisoning is the fourth common cause of mortality in India.<sup>7</sup> Acute pesticide poisoning is one of the most common causes of intentional deaths worldwide.<sup>8</sup> High doses of analgesics, tranquillizers, and antidepressants are the commonly used agents for intentional poisoning in industrialized countries.<sup>9</sup> Agriculture is major profession in the rural part of India farmers stock the pesticides to eradicate the weeds and pests. Due to easy availability of the pesticides, they are commonly used by the individuals to end their life in stressful situations.<sup>10</sup> Pattern of poisoning in a region depends on various factors which include availability and access to the poison, socioeconomic status of an individual, cultural and religious influences, etc. Therefore, regional epidemiological data on poisoning are very helpful in planning rational use of resources for the prevention and management of poisoning and in targeting

research. Against this background, the present study was undertaken to know spectrum and clinical profile of acute poisoning due to various non organophosphate and non organochlorine compounds.

## MATERIAL AND METHODS

This study was conducted in 155 patients of nonorganophosphate and nonorganochlorine compounds poisoning admitted in a tertiary care hospital during a study period of 24 months. This study was observational and patients from wards and ICU were selected, protocol was explained to patients and informed written consent at one time with help of inclusion criteria. A synopsis of the study protocol was submitted to the institutional ethics committee and approval was obtained. All necessary investigative work up done and clinical profile and outcome of different poisonings studied.

## RESULTS

It was found that 37.41% of patients were in between 2nd and 3rd and 29.03% of patients were in between 1st and 2nd decade. 81% were males and 74% were females.  $P = 0.838$  suggests that there was no significant difference in incidence of poisoning according to gender in each of age groups. Most of poisonings (92.09%) were due to suicidal intention and 5.16% were accidental in nature. About 1.93% of total poisonings occurred under the influence of alcohol. The mode of exposure was oral in all (100%) patients.

**Table 1:** Distribution of study subjects as per types of poisoning

Compound	No. of Patients	(%) Patients
Rodenticide	76	49.03%
Drug overdosages	27	17.41%
Herbicides	14	9.03%
Pyrethroids	9	5.80%
Kerosene	5	3.22%
Corrosives	4	2.58%
Imidacloprid	4	2.58%
Mosquito repellent	4	2.58%
Phenyl	4	2.58%
Dettol	3	1.93%
Castor seed	2	1.29%
Plant poisoning	1	0.64%
Amitraz	1	0.64%
Nitrobenzene	1	0.64%
<b>Total</b>	<b>155</b>	<b>100%</b>

Most common poisoning was due to rodenticides,  $n = 76$  (49.03%) followed by drug overdosages,  $n = 27$  (17.41%) followed by herbicides,  $n = 14$  (9.03%).

**Table 2:** Distribution of study subjects as per duration of ICU stay

Duration of ICU Stay in days	No. of patients (Total 155)	(%) Patients
0	118	76.12%
1	12	7.74%
2	6	3.87%
3	5	3.22%
5	8	5.16%
7	5	3.22%
11	1	0.64%
<b>Total</b>	<b>155</b>	<b>100</b>

Average duration of hospital stay was 3.3 days and average duration of ICU stay was 2.3 days. Total,  $n = 37$  (23.87%) patients required ICU care.

**Table 3:** Distribution of study subjects as per outcome

Outcome	Female	Male	Total	P Value
Survived	63	65	128	0.520
Died	6	7	13	0.849
DAMA	4	6	10	0.598
Absconded	1	2	3	0.606
Referred to Higher centre	-	1	1	-
<b>Total</b>	<b>74</b>	<b>81</b>	<b>155</b>	<b>-</b>

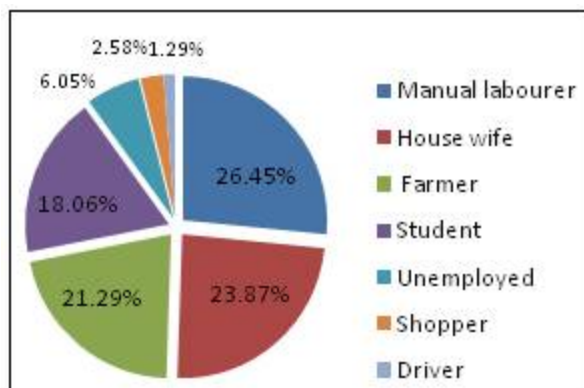
Most (82.58%) patients survived. Overall mortality was  $n = 13$  (8.38%). As  $p = 0.822$ , gender was not making any significant effect on mortality. Maximum mortality was due to rodenticides,  $n = 11$  out of 76 cases (14.47%) followed by herbicides,  $n = 2$  out of 14 cases (14.28%).

**Table 4:** Clinical manifestations and outcome of rodenticide poisoning

Variables	No. of patients (%)
<b>Sex</b>	
Male	35(46.05%)
Female	41(53.94%)
<b>Signs and symptoms</b>	
Vomiting	76(100%)
Abdominal pain	70(92.10%)
Palpitation	30(39.47%)
Respiratory distress	16(21.05%)
Arrhythmia	12(15.78%)
Hypotension	10(13.15%)
Oliguria	8(10.52%)
V.Tach	4(5.26%)
ICU Requirement	20(26.31%)
Mechanical ventilation	14(18.42%)
<b>Investigations</b>	
Deranged LFTS	34(44.73%)
Deranged PT	30(39.47%)
Deranged RFTS	8(10.52%)
<b>Outcome</b>	
Survived	61(80.26%)
Died	11(14.47%)
DAMA	4(5.26%)

Rodenticide poisoning was seen in  $n = 76$  (49.03%) patients of which 53.94% were females and 46.05% were males. Most common symptoms were vomiting in 100%

and abdominal pain in 92.10%, palpitation in 39.47%, respiratory distress in 21.05% patients. Liver function tests were deranged in 44.73% of patients and prothrombin time was deranged in 39.47% patients. Renal function tests were deranged in 10.52% patients. Arrhythmias were seen in 15.78% patients; 26.31% patients required ICU care and mechanical ventilation was required in 18.42% patients. Mortality was highest with rodenticide poisoning, with overall mortality of 14.47%.



**Figure 1:** Distribution of study subjects according to occupation. About 26.45% patients were manual laborers, 23.87% were housewives, 21.29% were farmers and 18.06% were students.

## DISCUSSION

In the study period of 24 months 155 cases were evaluated for their clinical presentation, spectrum of poisoning and their outcome. In this study we found that maximum number of patients were from age group 21-30  $n=58$  (37.41%) followed by 12-20  $n=45$  (29.03%) followed by 31-40  $n=39$  (25.16%). In Pawar *et al* study incidence of poisoning was maximum among young adults, age group of 20-29 years comprising 421 (45.62%) cases. Ramesha *et al* (144) studied total of 136 patients and most cases of acute poisoning presented in the age group between 20 and 29 years (31.2%) followed by 12 to 19 year age group (30.2%). In our study we found that most of the patients of poisoning were manual labourer  $n=41$  (26.45%) followed by housewives  $n=37$  (23.87%), farmers  $n=33$  (21.29%), student  $n=28$  (18.06%), unemployed  $n=10$  (6.45%), shopper  $n=4$  (2.58%), driver  $n=2$  (1.29%). Similar conclusion seen in Maharani *et al* study with labourers (18.66%) and farmers (13.33%) followed by house wives (28%). Ramesha *et al* in their study found that 44.8% (61) of the cases were manual labourers followed by housewives 13.2% (18), students 12.5% (17). In this study we found that most common poisoning was due to rodenticides with total number of patients  $n=76$  (49.03%) followed by drug overdoses  $n=27$  (17.41%) followed by herbicides  $n=14$  (9.03%), and

pyrethroids  $n=9$  (5.80%). Jesslin *et al* mentioned pesticides (39.5%) as most common poisoning followed by medicines (26.1%), household products (22.1%), while Garg *et al* in their study mentioned aluminium phosphide was the leading cause of poisoning (36.8%) followed by insecticides (31.6%). In this study most of poisonings were due to suicidal intention  $n=144$  (92.06%), followed by accidental  $n=8$  (5.16%), alcohol influence  $n=3$  (1.93%). Similar was seen with Srivastava *et al* study. In this study majority of patients were survived  $n=128$  (82.58%), overall mortality was  $n=13$  (8.38%). Out of these females were  $n=6$  and males were  $n=7$ . Mortality was similar in males and females as  $p=0.822$  (statistical test used is two proportion test) so gender is not making significant effect on overall outcome. Pawar *et al* concluded similar results with 91 (9.85%) cases died, 832 (90.15%) cases survived. In our study mortality was seen highest among rodenticide patients  $n=11$  out of 76 (14.47%), followed by herbicide  $n=2$  out of 14 patients (14.28%). Out of total 76 rodenticide poisoning patients males were  $n=35$  (46.05%) and females were  $n=41$  (53.94%). Symptoms of poisoning which were commonly found were vomiting  $n=76$  (100%), abdominal pain  $n=70$  (92.10%), followed by palpitation  $n=30$  (39.47%), respiratory distress  $n=16$  (21.05%). Chugh *et al* study showed vomiting (100%), pain in abdomen (100%), palpitation and sweating (80%), dyspnea and tachypnea (75%). Young age, suicidal intentions and easy availability of pesticides were main reasons seen in poisoning cases, so efforts need to be directed to improve overall socio economic and educational status of agricultural sector.

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