



## Poisoning and Drug Overdose admitted to Intensive Care Unit in an Urban Teaching Hospital - A retrospective study

### KEYWORDS

Drugs, Drug overdose, Poisoning, Poisoning agents, Pesticide

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**ABSTRACT** *Background: Poisoning and Drug Overdose are common health problems in developed countries as well as developing ones. They may be accidental or deliberate with suicidal intention and cause emergencies which may be associated with morbidity and mortality, often high. Methods: Retrospective observational study was undertaken for 51 months. Hospital records of patients with a diagnosis of poisoning or drug overdose were studied and data was collected. Data was analyzed using descriptive statistics. Results: A total of 33 patients of poisoning and drug overdose admitted to the intensive care unit included in the study (27 poisoning cases, 6 drug overdose cases). Maximum cases were in the age group of 21-30 years with 60% females. Organophosphates were most common poison and sedatives were most common drug overdose. Case fatality rate was 6%. Conclusions: Organophosphate pesticide and sedatives were most commonly used for self-harm. Young adults and females were common culprits. Preventive health programs should be undertaken to reduce its occurrence.*

### Introduction:

Poison is defined as a substance that damages or injures the body and endangers life due to its exposure.<sup>1</sup> Exposure to poison may be due to contact, inhalation or ingestion. Death due to poisoning is a major health problem seen all over the world, with the offending agents and mortality rates varying between countries. Chemicals used in agriculture, drugs and environmental substances are used as poisons, much of it intentional.<sup>2</sup> Management of poisoning and drug overdose is difficult with response relying on a variety of factors including type and quantity of poison/ drug, time from intake to treatment, and presence or absence of an antidote. The major reasons for poisoning may be monetary indebtedness, romantic disappointment, differences with spouse, and stress (examination, chronic illness, and emotional issues).<sup>3</sup> Acute poisoning with insecticide/ pesticide is one of the commonest cause of deliberate self-harm worldwide, while overdose of antidepressants, analgesics and tranquilizers are second most common cause of deliberate self-harm.<sup>4,5</sup> Overall fatality from poisoning and drug overdose ranges from 10-20 % with higher case fatality rate in developing countries as compared to developed countries.<sup>6</sup> We undertook this study to study the pattern of poisoning and drug overdose presenting to the intensive care unit (ICU) of our urban teaching hospital in western India.

### Material and Methods:

A retrospective observational study was conducted for duration of 51 months from November 2009 to January 2014. All patients admitted to the ICU with a diagnosis of poisoning or drug overdose were included in the study. A detailed review of their hospital medical records was undertaken. Data was collected from these records regarding demographic data, clinical characteristics, investigations done, treatment given and outcome of the patient. For diagnosis of poisoning, history of intake of poison or drugs, clinical features like nausea, vomiting, epigastric pain, hypotension, tachycardia, odour of organophosphate were taken into account. The following characteristics of the poison/ drug were noted- type and name, quantity consumed, route of exposure, antidote available and whether

administered. Deliberate or accidental poisoning, previous suicide attempts, time from consumption to hospitalization was also noted. The data was analyzed using descriptive statistics.

### Results:

The present study included 33 patients admitted to the intensive care unit with the diagnosis of poisoning and drug overdose, during the study period. Of these 27 had diagnosis of poisoning while 6 had a diagnosis of drug overdose. The age distribution is given in table 1. The youngest patient was 12 years old while the oldest patient was 70 years. The maximum cases were in the age group of 21-30 years (n=12) with patients in the 10-20 years group being the next most common. Females were more common than males overall as well as in the poisoning and drug overdose group (Table 1 and 2). There was no case of accidental poisoning or drug overdose. All the patients consumed the poison or drug with an intention of suicide or self-harm. Majority of the poisoning cases (62%) and all the cases of drug overdose (100%) were not considered life-threatening depending on the amount consumed and clinical features. The number of patients with serious intention to self-harm was 38% with 6% of patients even attempting hanging after consuming poison. The length of stay in the ICU was <5 days in 70% of patients, 5-10 days in 24% of patients and > 10 days in 6% of patients. The median stay in ICU was 4 days for poisoning with an interquartile range of 1 day to 17 days. The median stay in ICU was 2 days for drug overdose with an interquartile range of 2 to 5 days.

Among the poisoning cases, 24 patients (78%) consumed organophosphates, making it the most common poison consumed. The next most common poison consumed was phenyl (2 patients, 7%), though an unknown poison was consumed by 4 patients (15%). The most common drug used for overdose were sedatives (50%). Antipsychotic, antidepressants and paracetamol were the other drugs (Table 3). There were 2 deaths, both in the poisoning group for a case fatality rate of 6%.

**Discussion:**

An estimated 0.3 million people succumb and die every year, succeeding in their attempt at self-harm, due to various poisons.<sup>7</sup> Of those dying due to deliberate self-harm (DSH) in Southeast Asia, almost 40% used organophosphate compounds.<sup>6</sup> Data from western countries show that drug overdose is the commonly employed mode of DSH in these countries.<sup>8</sup>

Majority of patients in our study were young adults (67% in the age group of 10-30 years). This correlates with various studies conducted in our country as well as abroad.<sup>3,9,10</sup> It may be due to the fact that young adults are more impulsive in their behavior. The cases decreased from the fourth decade onwards. Women outnumbered men in all the age groups (except 31-40 years group), overall and the poisoning and drug overdose groups. There are many reports where men are predominantly involved in DSH.<sup>11,12</sup> Female preponderance has been reported in studies from Turkey and Japan.<sup>13,14</sup> This may be due to different response of the genders to stress (occupational, domestic) and DSH may be a response to inability to cope with this stress. All the cases (100%) were deliberate poisoning or drug overdose with an intention to cause self-harm. There were no cases of accidental poisoning or drug overdose. This is more than the study conducted at Chandigarh, where 75% were due to DSH, while 25% were accidental.<sup>15</sup> Increase in the cases of DSH may be due to increasing unemployment, urbanization, and lack of family support system and economic upheaval.

Organophosphate compounds were the most commonly consumed poisons and this agrees with studies from South India.<sup>4,16</sup> The cause for this may be the easy availability of organophosphate pesticide and their uncontrolled sale. Countries with an agrarian population had a high number of patients with organophosphate pesticide poisoning. Recent studies from North India have shown that Aluminum phosphide is the most common poison used for DSH, accounting for almost 68% of cases in one study.<sup>11,12,15</sup>

In western countries, drugs like benzodiazepines, antidepressants, barbiturates, anticonvulsants and paracetamol were more commonly used for DSH.<sup>4,16,17</sup> In our study, drug overdose comprised 18% of all cases. Sedatives comprised 50% of all drug overdose cases, similar to other studies reported from India.<sup>4,16,17</sup> Also, drug overdose was more common in women agreeing with some studies but differing from some studies in which it was commoner in men.<sup>4,16,17</sup> The occurrence of drug overdose may be due to the availability of these drugs as over the counter medication.

The duration of hospital stay in patients with poisoning and drug overdose was less than one week in 87% in one study from South India.<sup>17</sup> Amongst these, two thirds of the

patients with poisoning stayed in hospital for less than 3 days with a median of 2 days and an interquartile range of 1-4 days. Even in the present study, the length of stay in the ICU was less than 5 days for almost two thirds of the patients.

A high death rate has been reported with poisoning with case fatality rate of 2.4-30% from India, 7% from Sri Lanka and less than 0.5% from the United Kingdom.<sup>17</sup> The lower case fatality rate of our study may be because of the less severe and less life threatening nature of the poisoning and drug overdose as well as the treatment given at our tertiary care teaching hospital. The various ways to control pesticide poisoning are i) restricting use of and phasing out of most hazardous pesticide (WHO class I and II pesticides), ii) national policy and regulation for the same, iii) use of alternatives to pesticide which are safe and cost-effective, iii) prescribe a minimum pesticide list, iv) address patient risk factors for suicide through preventive and community health programs.<sup>18</sup>

**Conclusion:**

Organophosphate pesticide and sedatives are commonly used for deliberate self-harm. Young adults and females are affected. Death rate may be high. This public health menace needs time, money and concerted effort to create regulations, awareness, and information centers and help lines, to curb it.

**Table 1 Age and gender distribution of all patients**

Age, years	Number of patients	Male	Female
10-20	10	2	8
21-30	12	5	7
31-40	7	4	3
>40	4	2	2
Total	33	13	20

**Table 2 Gender distribution of patients with poisoning and drug overdose**

	Poisoning	Drug overdose
Male	13	0
Female	14	6
Total	27	6

**Table 3 Patterns of poisoning and drug overdose**

Poison (27 patients)	Number of patients (%)
Organophosphates	21 (78%)
Phenyl	2 (7%)
Unknown poison	4 (15%)
Drug overdose (6 patients)	
Sedatives	3 (50%)
Antidepressants	1 (16.6%)
Antipsychotics	1 (16.6%)
Paracetamol	1 (16.6%)

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