Age and Gender Distribution in Deliberate Self-poisoning Cases


Abstract

Introduction: Deliberate self poisoning is an important cause of hospital admissions and subsequent mortality. Due to different socioeconomic conditions death rates due to such suicidal attempts have been higher in the developing world as compared to the developed nations. Finding the patterns of deliberate self poisoning and the vulnerable age group involved will enable us to deal with the associated problems.

Objectives: To study the age and gender distribution in deliberate self poisoning cases.

Methodology: This is a retrospective analysis of cases of deliberate self poisoning admitted in the medical ward in Bir Hospital during the period of June 2007 to May 2008. All patients who had intentionally consumed toxic compounds like pesticides and drug overdosing were included in the study. Those who had accidental or occupational exposure to these products were excluded from the study. Patients who had been given drugs by others with the intent of criminal purposes were also excluded.

Results: Among 78 patients admitted for deliberate self poisoning, three fourths of the patients were females. More than one third of the patients were in the age group 20-<30 years group and more than half of the patients in both male and female groups were below the age of 30 years. The most frequently used compound was organophosphorus pesticides (61.5%) in both gender groups (male 76% and females 56%). Zinc phosphide (13%) and cypermethrine (8%) were also commonly consumed deliberately. Zinc phosphide poisoning was more common in the female group (17% vs 5%).

Conclusions: From our study we can see that deliberate self poisoning is more common in the female gender and the vulnerable age group is between 20-<30 years. Organophosphorus pesticides are the most commonly used compound for deliberate self poisoning.

Key Words
Deliberate self poisoning, organophosphorus poisoning, zinc phosphide.

Introduction
Deliberate self poisoning is an important cause of hospital admissions and subsequent mortality. It was responsible for around 600,000 deaths in 1990 in the developing world. This has caused major strain on the already overstretched health systems in the developing nations. The socioeconomical condition of people in the developing world has led to a higher suicidal rate as compared to the Western world. With the identification of vulnerable groups and patterns in deliberate self poisoning, it may become possible to identify problems that need to be addressed.

Objectives
To study the age and gender distribution in deliberate self poisoning cases.
Methodology

This is a retrospective analysis of cases of deliberate self poisoning admitted in the medical ward in Bir Hospital during the period of June 2007 to May 2008. All patients who had intentionally consumed toxic compounds like pesticides and drug overdosing were included in the study. A case was designated as unknown poisoning if the patient or the patient’s caretakers didn’t reveal the substance taken and toxicology examinations were negative. All the patients in our study with unknown poisoning did not fit into any of the clinical syndromes of poison cases and were discharged after being observed for about 48 hours. Those who had accidental or occupational exposure to these products were excluded from the study. Patients who had been given drugs by others with the intent of robbing them or for other criminal purposes were also excluded.

Results

A total of 78 patients were admitted for deliberate self poisoning out of which 21 were male patients and 57 patients were females. We can see from figure 1. below that almost three fourths of the cases were females.

![Fig. 1: Total Gender Distribution](image)

From Fig. 2 above, we can see that most of the patients in both the gender groups were found to be in the 20-<30 years group occupying more than one third in both male and female groups. There was a slight dip in the age group 30-<40 years only to rise again in 40-<50 years group in both genders. Above the age of 50 years, however, the cases were very few. In total, more than half the patients in both male and female groups were below the age of 30 years.

![Fig. 2: Age Distribution Pattern](image)

<table>
<thead>
<tr>
<th>age groups</th>
<th>male</th>
<th>female</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20 yrs</td>
<td>1.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>20-&lt;30 yrs</td>
<td>35.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>30-&lt;40 yrs</td>
<td>20.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>40-&lt;50 yrs</td>
<td>25.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>&gt;50 yrs</td>
<td>4.0%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

Table 1. Mean, Maximum and Minimum Age Distribution

<table>
<thead>
<tr>
<th></th>
<th>male</th>
<th>female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age (yrs)</td>
<td>31.2</td>
<td>28.1</td>
</tr>
<tr>
<td>Minimum age (yrs)</td>
<td>70</td>
<td>64</td>
</tr>
<tr>
<td>Maximum age (yrs)</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>
We can see that from Table 1 the mean age of male patients were slightly higher than female patients (31 vs 28 years).
From the study results, it is seen that majority of the patients deliberately consumed organophosphorus (OP) compounds as means to commit suicide or for other intentions like gaining attention, sympathy etc (Table 2, Figure 3). This was followed by zinc phosphide or rodenticide poisoning at a distant second. There were two cases of mixed poisoning, one was a combination of paracetamol plus alprazolam and the other was a combination of amoxicillin plus metronidazole.

### Table 2. Frequencies of different types of poisoning and Gender Distribution

<table>
<thead>
<tr>
<th>Type of poisoning</th>
<th>Total No. of cases (n=78)</th>
<th>(%)</th>
<th>Male patients (n=21)</th>
<th>(%)</th>
<th>Female patients (n=57)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organophosphorus</td>
<td>48</td>
<td>61.5</td>
<td>16</td>
<td>76</td>
<td>32</td>
<td>56</td>
</tr>
<tr>
<td>Zinc phosphide</td>
<td>11</td>
<td>13</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Alum. phosphide</td>
<td>2</td>
<td>2.6</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>2</td>
<td>2.6</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Unknown Poisoning</td>
<td>5</td>
<td>6.4</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Cypermethrine</td>
<td>6</td>
<td>8</td>
<td>3</td>
<td>14</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Carbamates</td>
<td>1</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sedatives</td>
<td>1</td>
<td>2.6</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>mixed poisoning</td>
<td>2</td>
<td>2.6</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Fig. 3: Frequencies of different types of Poisoning

Organophosphorus was the leading poison in both male and female patients. In our study, none of the male patients had taken aluminium phosphide and two female patients had taken it. Paracetamol was uncommon as well, with only two female cases. There was a slightly higher incidence of cypermethrine poisoning in males (14% vs 5%).
Regarding age group distribution of OP poisoning, the majority of the patients were in the age group 20-<30 years in both sexes (Fig 4). There was however comparatively reduced frequency in the extremes of age groups (<20 years and >50 years).

Fig. 4: Age Group Distribution of OP poisoning in Different Genders

Rodenticide poisoning in females was found to be more common (66.6%) in female patients less than the age of 20 years. It was also the second commonest poisoning in the group.

Discussions
This study involved 78 patients, three fourth of them were females and the most vulnerable age group was 20-<30 years. A study conducted in Turkey produced similar results. That study included 44 (25.9%) male and 126 (74.1%) female. The M/F ratio was 1.0/3.5. In this Turkish study, the mean age of patients was 23.3 +/- 6.3 years; 63 (37.1%) of them were under 20 years of age and 147 (86.5%) were under 30 years of age. In our study the mean age of the patients were slightly higher with 31 years for male patients and 28 years for female patients.

A four years study conducted in Orissa involved 588 suicide cases and found that both male and females were affected equally. The major mode of suicide was however both hanging as well as self poisoning. The largest age group was similar to our study i.e. 21-30 years. Another study carried out in Turkey involved 131 (59.5%) female and 89 (40.5%) male patients. The most affected age group was 15-24 years (40.5%) in both sexes. Leslie SJ and associates had made a survey of admissions following self poisoning which involved 4220 patients. In their study, the average age was 34 years and most were females (56% vs 44%, p value < 0.001). 12% of the patients were between the age of 13-18 years. Eddleston et al. investigated the epidemiology of intentional self-poisoning in rural Sri Lanka by prospectively recording 2189 admissions to two secondary hospitals. Many patients were young (median age 25 years), male (57%) and used pesticides (49%). An analysis of all poisoning cases admitted in medical and pediatric wards of Patan Hospital for one year (1st Jan to 31st Dec 2004) was carried by Paudyal BP. In his study also females outnumbered males and almost two-thirds patients were young adults (15-34 years). The sex ratio from these studies show that gender patterns and age distribution differ from place to place and region to region.

As we have also seen in our study, agrochemical pesticides are the most important poison throughout the developing world, being both common and associated with high mortality rate. Our study had more than 60% of the patients taking organophosphorus compounds. A study
from Bangladesh showed that 14% of all deaths amongst 10-50 year old women were due to poisoning, the majority of them suicidal ingestion of pesticides. A study conducted in Patan Hospital also revealed that organophosphorus compounds (42%), drugs (25%) and zinc phosphide (6.5%) were common poisonings. This problem has been compounded by easy access to such pesticides which is difficult to be brought into strict regulation because of its immense role in agriculture, this agro economy being the main financial backbone of most developing countries. Among pesticides, OP compounds are widely used for agriculture, vector control and domestic purposes. Despite the apparent benefit, these compounds are becoming the most important cause of self poisoning, being responsible for more than 200000 deaths each year in developing countries.8

Paracetamol poisoning cases were quite few as compared to frequency found in the UK. Deliberate self poisoning cases with paracetamol however have been reported from different Asian countries too like Kuwait, Bahrain,10 Malaysia,11 Singapore12 etc.

Aluminium phosphide, a toxic pesticide recently became the commonest means of self poisoning in Northern India.14 In our study however there were only two female patients who had consumed aluminium phosphide.

In our study zinc phosphide which is commonly used as a rodenticide was the second most common product used for deliberate self harm. A small case series with zinc phosphide was reported from Poona, India in which out of four symptomatic patients, one died.15 A five year retrospective study from January 2000 to December 2004 was conducted in Manipal, India to understand the magnitude and pattern of suicidal poisoning deaths among males and females in Southern India.16 Preference for organophosphates was relatively more in males when compared to females, who preferred zinc phosphide, carbamates and medicinal agents.

Conclusions

Our study shows that for most patients the most preferred compound for deliberate self poisoning is organophosphorus compounds. Females were found to be more prone to such attempts and the most vulnerable age group was 20-30 years in both sexes.

Trends in self poisoning change with time as well as regions hence studies have to be conducted at regular intervals to understand the emerging patterns and identify the underlying problems. Prevention of self poisoning and reducing death will require multiple approaches. Apart from the medical aspects of poisoning, health systems should develop practical ways to deal with the psychosocial impacts on the patients. The latter part maybe even more difficult for a country like ours where there are very few qualified psychiatrists and even those who have access to such support are hesitant to seek advice. Development of cost effective social support groups and help lines may help to some extent in preventing suicidal cases as well as providing guidance and support to those who have attempted suicide. The social stigma left behind after a failed attempt often creates further problems for the patient. The important task is to provide adequate provision of psychiatric and social support to ensure access to greater number of patients.

References


