SOCIODEMOGRAPHIC PROFILE OF POISONING CASES

Shreemanta Kumar Dash, Assistant Professor Department of Forensic Medicine, Aluri Sitarama Raju, Academy of Medical Sciences, Malkapuram, Eluru - 534004, W.G District, A.P, India, Manoj Kumar Mohanty, Assistant Professor Dept. of Forensic Medicine, Kiran Kumar Patnaik, Assistant Professor Department of Forensic Medicine, Dr Pinnamaneni Siddhartha Inst. of Medical Sciences, Chinoutpalli, Gannavaram Mandal Krishna, AP Sachidananda Mohanty, Assistant Professor Department of Forensic Medicine, M.K.C.G. Medical College, Berhampur-760004 Orissa, India.

ABSTRACT

Acute poisoning is an important medical emergency and one of the causes of death. A thorough knowledge of the profile of the victim is essential for management and prevention of poisoning. The present paper evaluates pattern of poisoning cases including deaths over a period of two years from 1999 to 2001 in Berhampur, Orissa. 53.3% of the cases were male with male to female ratio 1.14:1. Peak incidence was observed in the age group 21-30 years (124 cases). More than four-fifth of the cases belonged to medium socioeconomic status and 58.1% cases were from rural areas. Majority of the victims were literate and married outnumbered the unmarried cases. Occurrence of poisoning was more common in day time and during Summer season. Organophosphate compounds was the most commonly (22.9%) abused substance. Based on these findings preventive measures like restriction of sale and strengthening the legislature on availability of poison, promoting poison information center etc have been put forward. 

Key words: Deaths, organophosphates, poisoning, preventive measures, victims

INTRODUCTION

Owing to the vast development in the field of chemical technology a significant number of new compounds have been added as new poisonous substances, used in the field of trade, industry and medicine. Poisoning is a medical emergency and a patient is always invariably rushed to the hospital at the earliest possible moment, irrespective of the amount and nature of poison ingested. All the cases of poisoning are admitted through emergency services where the safety of life of the patient is the main issue for the doctor. In many countries the number of patients who suffer from some or other form of acute poisoning is increasing. Easy availability of poisons plays a major role in both accidental and suicidal poisoning cases. A person prefers to swallow a pill and have a peaceful death rather than die by hanging or shooting on self.

Sickness squanders the true wealth of a nation. Although sickness cannot be avoided or cured but those due to poisoning is largely preventable. But it is a matter of great disappointment that the number of persons in this state, specifically in southern Orissa, suffering from acute poisoning is increasing year by year. Although statistically the figure of acute poisoning cases is somewhat less than that of those injured in road accidents, the numbers of death from either case is very nearly the same. It is surprising that whilst the number of deaths from road accidents is rightly a matter of great public concern far less attention is paid to an almost equal number of deaths caused by poisoning. The complexity of the possible causes and the rapid increase in newer drugs and chemicals with potentially harmful effects is a matter of concern to those responsible for treatment, and makes it increasingly difficult for them to retain their confidence and command of the situation, which is very essential in dealing with cases of acute poisoning. A thorough knowledge about the nature and magnitude of the problem in a particular area is essential for the doctors in hospital practice. Present study was taken up to
identify the more common causative agents and to analyse the epidemiological and social factors, which can provide a practical guide for the general practitioners and resident hospital staffs towards the management of acute poisoning.

**MATERIAL AND METHODS**

This is a prospective study in which all the acute poisoning cases admitted in M.K.C.G. Medical College Hospital, Berhampur, the only referral hospital of southern Orissa, present on the Eastern part of India and the records of fatal cases of poisoning died due to drugs or chemicals referred for medicolegal autopsy to the Department of Forensic Medicine and Toxicology during the period from September 1999 to August 2001 were subjected to post mortem examination were taken up and evaluated in detail. As majority of the cases being admitted to the M.K.C.G. Medical College Hospital, the bed head tickets which contain the details of treatment and laboratorial diagnostic aspects of the cases in poisoning were also reviewed during post mortem examination in the hospital. During the above mentioned period a total of 306 poisoning cases came to M.K.C.G. Medical College Hospital, Berhampur for treatment and 62 No. of cases were subjected to post-mortem examination in the central mortuary of F. M. & T. Department of M.K.C.G. Medical College, Berhampur.

Particulars in respect of poisons/drugs history, household remedies by the deceased and any peculiar finding seen in the deceased after suffering from poisoning were obtained not only by direct interrogation with the relatives, friends or others accompanying the deceased but also from the police. Identification of etiological/precipitating factor responsible for poisoning was made by discussing the matter with patient or his/her relatives after establishing a proper rapport with them.

The clinical diagnosis of the nature of the poison consumed was based on Reliable History, presentation of the remaining stuff/container from which the poison had been consumed/gastric aspirates (vomitus) and suggestive clinical picture which further confirmed by post mortem examination and further steps are also taken to confirm the nature of the poison as per the reports obtained by chemical analysis (C.E.) and post mortem findings are studied to corroborate the diagnosis in cases where such chemical examination reports unavailable.

Information on the type of poison consumed, socio-economic status, incidence on age and sex, marital status, seasonal variation, details as any other accompanying ailment (domicile, literacy etc.) were noted from records in a separate proforma for each case.

**RESULTS**

Three hundred and six cases were admitted to the Hospital with diagnosis of acute poisoning. Total male affected are 163 (53.3%) dominating the female. (Table - 1) The incidence of poisoning according to age and sex shown in Table - 2 reveals that there is an increasing trend of poisoning with increase in age up to 30 years and then declines with a peak incidence in the age group 21 - 30 years which represented 124 (40.5%) cases in this study.

It is evident that 256 (83.7%) of victims were of medium socio-economic status (Table-3). The domicile pattern of the victims shows 178 (58.2%) cases were from rural area. (Table - 4) Literacy status of the victims reveals that at the time of incidence 257 (83.9%) cases were literate(Table- 5). Among the 306 cases admitted to the hospital with diagnosis of acute poisoning 156 (50.9%) cases were married. (Table-6)

Maximum incidences of cases 97 (31.7%) were recorded in Summer season. (Table - 7) Considering the time of poisoning, this shows that the majority of cases (55.9%) were observed during the daytime, between 6 AM to 6 PM. (Table - 8) Organophosphorous is the most commonly abused poison. (Table 9)

**DISCUSSION**

Out of 306 poisoning cases admitted to M.K.C.G. Medical College Hospital, Berhampur 62 cases succumbed to the complications of poisoning. The sex incidence affected with poisoning was more with male which outnumbers the female the ratio being 1.14 : 1 and tallies with the study of others.[1-7] Male preponderance in this study could be accounted to the fact that males
are more often exposed to the stress and strain of
day to day life, as well as to the occupational
hazards than the females in this place.

The age group with maximum incidence of
poisoning was between 21 - 30 years and is
significantly less in the extremes of age. The
present study coincides with the study of other
workers. [1,3,5,7-9] It is obviously due to the fact
that this age group is the determining factor of the
life in terms of studies, service, marriage and other
life settlement factors. Therefore, they are
subjected to substantial amount of mental stress
and strain during this period.

Poisoning is more prevalent among the
medium socio-economic group The similar type
of finding was presented by other authors. [5,10,11]
The middle and low socio-economic groups are
more vulnerable for poisoning (suicide) which may
be due to the fact that they are under continuous
financial and other stress during life.

The Southern parts of Orissa, mostly
comprising of agricultural land, the geographic
distribution of the Victims chiefly being from rural
areas and comprising of 178 cases. This study
correlates with the study of many authors. [2,10-
12] The preponderance of poisoning and death due
to poisoning is more in rural areas than in urban
areas as shown by different authors including the
present study which can be reasoned out that the
occurrence is due to abundant use of pesticides in
agricultural fields of rural areas and inhabitation of
poisonous reptiles (snakebite) in unhealthy and hilly
rural areas.

In respect of the incidence of literacy status
in the present study, it is seen that majority of cases
were literates and 49 (16%) are illiterate, which
coincides with the studies by authors from Rohtak,
Haryana. [10,12] Failure in the life and tolerance
to the problems are better understood by the
literates than the illiterates. Married person more
often become victims of poisoning which is
consistent with studies from Chandigarh[2] and
Rohtak[10] owing to the fact that the married people
(both medium and low socio-economic group) have
to undergo more amount of stress in their day to
day life than the single males or females which
makes them more vulnerable to the poisoning.

A season-wise variation was seen in the
poisoning incidence in the present study with
Summer showing the maximum numbers of victims.
The seasonal variation of poisoning was also
reported by others [12]. Another study done at
Manipal [13] shows that Winter is the most
vulnerable period of poisoning. Incidence of
poisoning is more during Summer months and can
be attributed as because the Summer days being
longer and during which the person becomes easily
fatigued and exhausted as a result of extreme heat
conditions tilting his mental balance and attitude
towards life. The preservation of grain starts from
March, which is related directly to the overall use
of pesticides and variety of chemicals. Therefore
the sudden rise of cases from February to March
is mainly due to this fact, while the succeeding
months are the time of school, college examination
and results followed by admissions in new classes.
The failure in any of these things may increase the
tendency to commit suicide. The poison was
consumed mostly during daytime. Similar type of
observation was made by others. [4] The fact behind
the trend can be explained as the literate mass
mostly in the day time are engaged in multifarious
works and are subjected to great stress and strain,
which make them vulnerable to attempt self
poisoning.

In the present study 84 (27.5%) cases were
due to insecticidal poisons. Similar type of findings
were noted by other authors. [6,13,14-17] Southern
Orissa being mainly an agricultural area7, insecticides are available abundantly and easily
even in local shops. The easy availability and
cheaper price have made them a popular killer
agent specially among the medium and low socio-
economic groups in the present study.

The present study highlights the following
features
(1) Males are affected more (53.3%) than the
females, the highest incidence of poisoning being
in the age group of 21 - 30 years.
(2) Most victims are recorded from the medium
socioeconomic group belonging chiefly to the rural
areas.
(3) Most victims belong to the literate group with
married population outnumbering the unmarried.
(4) Maximum number of poisoning cases are
encountered in the Summer season, daytime (6
AM to 6PM) being most suitable.

(5) Considering the commonly abused poisons, 84 cases (27.5%) cases constituted insecticidal poisons (OPC, OCC and Carbamates)

It is inevitable that younger generation has become victim of poisoning with the number increasing year after year. Although there are restrictions on sale of drugs and drugs control in India, vulnerability to insecticide cannot be ignored. It is also important to strengthen the legislature on availability of drugs and poisons and more important to strengthen the preventive measures by such as educating people through Drug education programme, increasing awareness among the young about harmful effects of drugs, promoting poison information centers, introducing separate toxicological units in the hospitals and upgrading the peripheral health centres to manage cases of poisoning in emergency.

In spite of this extensive study it is further suggested to find out causes and nature of poisoning and design appropriate health education programme for prevention of both suicidal and accidental poisoning for the benefit of the public at large.

### TABLE - 1
Showing incidence of sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>63</td>
<td>53.3</td>
</tr>
<tr>
<td>Female</td>
<td>143</td>
<td>46.7</td>
</tr>
</tbody>
</table>

### TABLE - 2
Showing the incidence of poisoning according to diff. age

<table>
<thead>
<tr>
<th>Age in yrs</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>7</td>
<td>2.3</td>
</tr>
<tr>
<td>11-20</td>
<td>64</td>
<td>20.9</td>
</tr>
<tr>
<td>21-30</td>
<td>124</td>
<td>40.5</td>
</tr>
<tr>
<td>31-40</td>
<td>66</td>
<td>21.6</td>
</tr>
<tr>
<td>41-50</td>
<td>40</td>
<td>13.1</td>
</tr>
<tr>
<td>&gt;50</td>
<td>5</td>
<td>1.6</td>
</tr>
</tbody>
</table>

### TABLE - 3
Showing the socio-economic status of the patients

<table>
<thead>
<tr>
<th>Socio-economic Status</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>49</td>
<td>16</td>
</tr>
<tr>
<td>Medium</td>
<td>256</td>
<td>83.7</td>
</tr>
<tr>
<td>High</td>
<td>1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

### TABLE - 4
Showing domicile pattern of the victims

<table>
<thead>
<tr>
<th>Domicile</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>178</td>
<td>58.2</td>
</tr>
<tr>
<td>Urban</td>
<td>128</td>
<td>41.8</td>
</tr>
</tbody>
</table>

### TABLE - 5
Showing literacy status of the victims

<table>
<thead>
<tr>
<th>Sex</th>
<th>Literate</th>
<th>Illiterate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>131(51%)</td>
<td>32 (65.3%)</td>
</tr>
<tr>
<td>Female</td>
<td>126 (49%)</td>
<td>17 (34.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>257 (83.9%)</td>
<td>49 (16%)</td>
</tr>
</tbody>
</table>

### TABLE - 6
Marital status of the victims

<table>
<thead>
<tr>
<th>Marital status</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>156</td>
<td>51</td>
</tr>
<tr>
<td>Unmarried</td>
<td>150</td>
<td>49</td>
</tr>
</tbody>
</table>

### TABLE - 7
Showing seasonal incidence of poisoning

<table>
<thead>
<tr>
<th>Seasons of the year</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer (Mar, Apr., May)</td>
<td>97</td>
<td>31.7</td>
</tr>
<tr>
<td>Rainy (Jun, Jul, Aug)</td>
<td>85</td>
<td>27.8</td>
</tr>
<tr>
<td>Spring (Sept, Oct, Nov)</td>
<td>70</td>
<td>22.9</td>
</tr>
<tr>
<td>Winter (Dec, Jan, Feb)</td>
<td>54</td>
<td>17.6</td>
</tr>
</tbody>
</table>
TABLE - 8
Showing the incidence of day and night time of poisoning

<table>
<thead>
<tr>
<th>Time</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day (6 AM - 6 PM)</td>
<td>171</td>
<td>55.9</td>
</tr>
<tr>
<td>Night (6 PM - 6 AM)</td>
<td>130</td>
<td>42.5</td>
</tr>
<tr>
<td>Not known</td>
<td>5</td>
<td>1.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>306</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 9
Showing the commonly abused poisons by the victims

<table>
<thead>
<tr>
<th>Poison abused</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organophosphates and compounds</td>
<td>70</td>
<td>22.9</td>
</tr>
<tr>
<td>Organochlorine</td>
<td>8</td>
<td>2.6</td>
</tr>
<tr>
<td>Carbamate</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Snake bite</td>
<td>45</td>
<td>14.7</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>31</td>
<td>10.1</td>
</tr>
<tr>
<td>Phenyl</td>
<td>29</td>
<td>9.5</td>
</tr>
<tr>
<td>Rat poison</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Zinc Phosphide)</td>
<td>27</td>
<td>8.8</td>
</tr>
<tr>
<td>Oleander</td>
<td>20</td>
<td>6.5</td>
</tr>
<tr>
<td>Alcohol</td>
<td>12</td>
<td>3.9</td>
</tr>
<tr>
<td>Drugs</td>
<td>22</td>
<td>7.2</td>
</tr>
<tr>
<td>Corrosives</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Scorpion sting</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Dhatura</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Cannabis</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Kerosene</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Unknown poison</td>
<td>15</td>
<td>4.9</td>
</tr>
</tbody>
</table>

References


