

Original Research Article**Intentional self poisoning: Scenario at a tertiary health care hospital in Mangalore, India**Ullasa Shetty,¹ K. Jayaprakash,¹ Deepak C. Patil,² Karen Prajwal Castelino¹¹Department of Forensic Medicine, A.J. Institute of Medical Sciences, Mangalore, India²Department of Community Medicine, A.J. Institute of Medical Sciences, Mangalore, India**Abstract**

Suicidal or deliberate self harm by poisoning is an important cause for mortality and morbidity in any given population. This study is undertaken to study the profile of intentional self poisoning cases admitted in A.J. Hospital and Research Centre, Mangalore, India retrospectively in terms of number of cases each year from 2003 to 2009, age, gender, occupation, religion, time of day, month, types of poison used, mortality, duration of hospital stay/survival, reasons, suicide note kept or not, number of previous attempts so as to help the current health system in tackling this health hazard. Observational, record based cross sectional study of intentional self poisoning cases (total=235) admitted in the corporate section of medical college (A. J. Hospital and Research Centre) from January 2003 to December 2009 using case sheets was done. In our study we found Hindus, males, in the 21 to 30 age group forming majority of the suicidal poisoning cases. Majority of the patients took poison during the onset of monsoon, beginning of month or end of the month and end of the day. 13% mortality was found in these cases. The average duration of stay in the hospital was for 3 to 4 days. People involved in agriculture and related work, people with depression and other mental illness were affected the most. Insecticide poisoning was the most popular amongst all, followed by therapeutic drugs and rat poison.

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1. Introduction

Intentional or deliberate self harm by poisoning is a major health hazard and expenditure to the public and government. More than 50,000 people die every year from toxic exposure in India. Mortality in poisoning cases is 1 to 2% in developed countries and in India it varies from 15 to 35 %.^{1,2} In the year of 2008 poisoning was responsible for 2,52,000 cases of mortality world

wide and 28,012 cases were reported in India.³ Though with the advent of effective drugs and sophisticated technologies we are able to bring down the mortality but morbidity in terms of loss of disability adjusted life years (DALY) in the people of most productive age group is devastating. The incidence of deliberate self harm by poisoning is on the rise due to the soaring stress and strained relations as a result of urbanization and modernization.⁴⁻⁹ Reporting of

such cases, national epidemiological data, research and training is still in infancy stage in India. In this study we are looking in to the epidemiological profile of intentional self poisoning cases admitted in A.J. Hospital and Research Centre, Mangalore, India, retrospectively comprising of number of cases each year from 2003 to 2009 and in terms of age, gender, occupation, religion, time of day, month, types of poison used, mortality, duration of hospital stay/survival, reasons, suicide note kept or not, number of previous attempts so as to help the current health system in tackling this health hazard.

2. Materials and methods

Record based cross sectional study of intentional self poisoning cases (total=235) admitted in tertiary care, corporate section of the A. J. Insitute of Medical Sciences (A. J. Hospital and Research Centre), Mangalore, situated in coastal Karnataka, south India from January 2003 to December 2009 was done. The accidental and homicidal poisonings were excluded from the study. In few cases missing data were collected by contacting the patients or relatives over the telephone. The data regarding number of inpatient cases each year from 2003 to 2009 in terms of age, sex, occupation, location of

incident, time of incidence, date, duration of stay/survival, recovered or not, type of poison, reasons for the act, marital status, religion, any history of previous attempts and number of attempts were collected. All the data were entered in a proforma and analyzed using SPSS 16.0 software.

3. Results

Out of total 64,569 inpatient admissions during the period of 2003 to 2009, 235 cases were of intentional self poisoning (Table 1). This constitutes 0.36% of total admission. In 235 cases 54.5% were males and 45.5% were females. Religion wise, Hindus were at an overwhelming majority comprising 84.3% followed by Christians at 8.1% and Muslims 7.7%. In our study 54.9% patients were married and 44.3% were unmarried and 0.9% divorced or widowed. In our study 21 to 30 age group stood on the top of the table contributing 46.8% of cases followed by 11 to 20 age group at 19.6% and 31 to 40 age group with 17.4 % (Table 2). In this study we found that 74.89% of the cases recovered, 12.76% cases died and 12.3% of cases were discharged against medical advice. Monthly trend shows October having maximum number of cases with 12.8% followed by June and July with 10.2% each. May to August showed 39.6%

Table 1: Yearwise distribution of cases

Year	Total suicidal poisoning cases	Total inpatient cases	Percentage of distribution
2003	19	7979	0.24
2004	28	11582	0.24
2005	27	7138	0.38
2006	30	7284	0.41
2007	25	9524	0.26
2008	51	10455	0.49
2009	55	10607	0.52
Total	235	64569	0.36

Table 2: Age incidence (n=235)

Age groups	No. of cases	Percentage
1 -10	2	0.9
11-20	46	19.6
21-30	110	46.8
31-40	41	17.4
41-50	17	7.2
51-60	15	6.4
>61	4	1.7

Table 4: Intraday variation (n=235)

Time of day	No. of cases	Percent
5 am - 9 am	28	11.9
9 am - 1 pm	43	18.3
1 pm - 5 pm	42	17.9
5 pm - 9 pm	68	28.9
9 pm - 1 am	49	20.9
1 am - 5 am	5	2.1

of occurrence which coincides with rainy season in the region (Table 3). 89.4% of the patients consumed poison at their residence and the remaining 10.6% preferred work place, hostel or forest. Between 5 pm to 9 pm was opted by 28.9% of patients and 20.9% preferred 9 pm to 1 am (Table 4). Beginning of the month was slightly favoured, 1-10th day of month 36.6%, 21st to 31st of month 33.6%, 11th to 20th was 29.8 %. Previous attempts of intentional self poisoning were found only in 5.5% of the cases. The data analysis shows that agriculture and related workers constituted 33% of the cases, followed by housewives 25%, students 21%, business and service sector 14% and 7% were unemployed (Fig. 1). 41% of the patients preferred insecticides, 24% therapeutic drugs, 11.5% rat poison, 10% corrosives and chemicals and 10% patients used more than one method (Fig. 2). Mean duration of stay/survival was 7.38 days. Depression and other mental illnesses were the main reason for committing intentional self harm

Table 3: Seasonal distribution (n=235)

Months	No. of cases	Percent
Jan-April	64	27.2
May-August	93	39.6
Sept-December	78	33.2

by poisoning making up 25% of the cases, financial stress reported in 19.5% of the cases, marital discord 14.5%, love failure contributed 14% of the cases and 11% of the cases the reason could not be found out (Table 5).

In those patients who succumbed to the poison, 63.3% were married, 73.3% were males. The incidence of mental illness was the major reason (27%) followed by financial stress 20%, marital discord and love failure 13% each, alcoholism 7%, chronic illness 10% and reason could not be elicited in 10% of cases. 50% of the fatality was due to insecticides, 20% due to rat poison and 13% used combination of poisons (Fig. 3). Occupation wise data showed that 40% of victims were agriculture and related workers, 23% housewives, 13% students, and business and service sector 17%.

Table 5: Reasons for intentional self poisoning (n=235)

Reasons	No. of cases	Percentage
Depression & mental illness	59	25
Financial stress	46	19.5
Marital discord	34	14.5
Love failure	32	14
Chronic alcoholism	14	06
Exam stress	12	05
Chronic illness	10	04
Harassment	02	01
Don't know	26	11

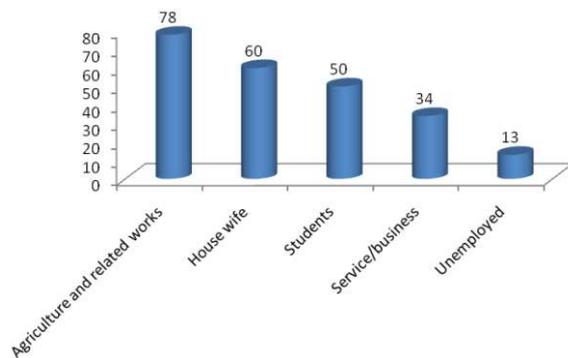


Fig. 1: Occupation profile (n=235)

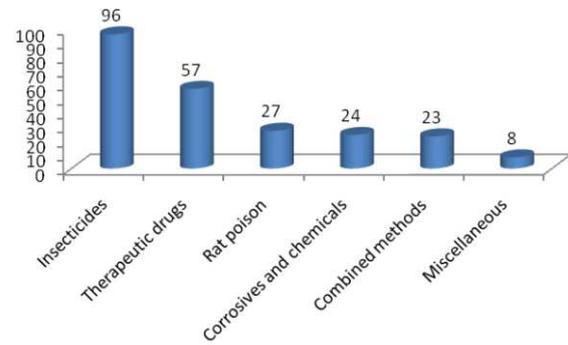


Fig. 2: Type of poisoning (n=235)

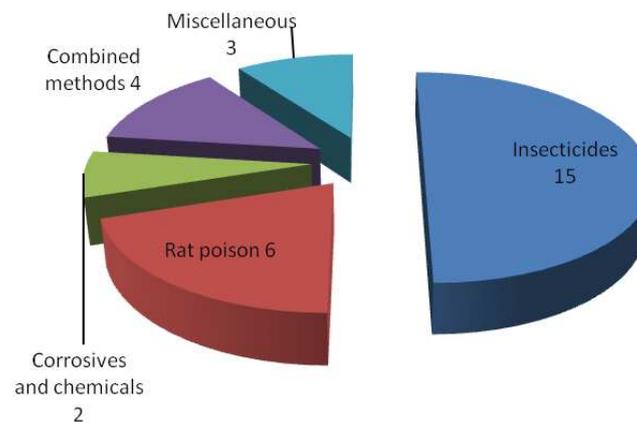


Fig. 3: Type of poisoning in death cases (n=30)

4. Discussion

In our study we found that the number of cases of intentional self poisoning constituted less than 1% of total admissions which is also suggested by another study in the region.¹⁰ Hindus constituted bulk of the cases (84.3%). Though Muslims roughly form 25% of population in this region, they formed only 7.7% of cases. This can be attributed to Islamic Sheriat laws which ban suicide.¹¹ Gender wise distribution suggests that females were lesser in number compared to males though in this part of the country sex ratio is favourable to females. Men outnumbering females could also be due to easy accessibility of poisons to men than females corroborating with other studies.¹⁰⁻¹⁹ In our study 55% were married,

44% unmarried and two cases were divorced and widowed. Age group analysis suggested that younger and most productive age group were affected the most. 20 to 40 age group formed about 2/3rd of total cases, suggesting huge economic impact incurred to the country. This data is also similar to other studies.^{10,13,14,20-26} Surprisingly two cases of less than 10 years reported suicidal attempt by poisoning. This may be attributed to current social upbringing, parental pressure and high stress imparted by current education system in our country. The idea of contemplating suicide in children is less due to less depression, high level of care and exposed to less stressors.²⁷ About 20% of our cases were in their teens, where peer pressure, exam stress and social media matter the most.

Out of 235 cases studied, 3/4th of cases recovered eventually (parasuicide) and mortality occurred in 12.76% cases which is substantially high compared to developed countries.^{1,28} A similar study conducted in Manipal shows 16% mortality, a north Indian study shows 2.4% mortality and a subsequent study in our hospital from 2009 to 2010 showed 12.4% mortality.^{10, 26,20} In other Indian studies mortality varied from 5% to 30%.^{13,15,29-33} In our study 50% of mortality was due to insecticides and 40% due to rat poison. A significant number of cases forming discharged against medical advice may be due to financial constraints.

In patients who died, 73.3% were males, 90% Hindus, 63.3% married, 53.3% were of 21 to 30 age group. Occupation wise, 40% belonged to agriculture and related works, 23.4% were housewives. 53.4% of the deaths occurred during the rainy season (May to August). Insecticides were the causative agent in 50% of the cases; rat poison 20% followed by combined methods 13% (insecticides + alcohol / antidepressants, rat poison + kerosene). Similar studies in the region showed 66% mortality due to insecticides, rat poison 15%.^{10,20} Post mortem study conducted by Shetty et al. in the region showed similar parameters, male dominance (69.2%), maximum mortality among 21 to 40 age group, consuming poison at their residence (86.9%), rainy season and insecticides being commonest.³⁴ A retrospective analysis of autopsy cases done in Manipal shows predominance of males (71.2%), 21-30 age group (28.3%) and organophosphate compounds causing 68.7% of the cases studied.³⁵

Month of October showed highest number of cases followed by June and July. This suggests that cases peaked with the onset of monsoon (rainy season) and onset of winter. The onset of rain is also a season of exam results, starting of new academic year and agricultural activities in this demographic region.²¹ 90% of patients in our study preferred their home as a place of

committing the act while 10% opted outside their home like work place, forest, college or hostel. In our study half of the patients took poison during the period of 5 pm to 1 am whereas other study showed 25%.²⁶ This trend could be due to increasing stress as the day advances and people are preoccupied with their work during 9 am to 5 pm and also because family members were less alert.³⁶ History of previous attempt was found in 5.5% of cases. 85% of those who had history of previous attempt were suffering from psychiatric illness. Suicide note was found only in two out of 235 cases. People who were in agriculture and related works formed 1/3rd of cases in our study. This could be due to rain dependent harvest making agriculture less profitable. These people have more accessibility to the common poisons.²¹ Housewives formed 1/4th of the cases and students formed 1/5th of the cases as Mangalore is an educational hub of Karnataka. Students and housewives also formed majority in a similar study conducted in Himachal Pradesh.³⁷ Insecticides mainly organophosphorous compounds were the most common poison in our study forming 41% of the cases which is similar to other studies.^{10-15,20,26,35,38-40} This indicates a need for an integrated pest management and restriction of use of insecticides.⁴¹ Therapeutic drugs formed 25% of the cases, followed by rat poison at 11.5%. In therapeutic drugs, sedatives and antidepressants were the most common as also suggested by another study.²⁶ In western countries therapeutic drugs are the most common agents used for intentional self harm.^{42,43} Rat poison is the leading cause of death in northern India.^{44,45} We found combination of methods in 3.5% of the cases, where organophosphorous compounds or rat poison was combined with alcohol or therapeutic drugs. About 40% of the patients stayed in the hospital for an average period of 3 to 4 days.

The reason for suicidal poisoning varied from depression to harassment and financial stress to exam stress. Depression and mental illness was the main reason in 25% of the cases followed by

19.5% of the cases due to financial stress. Marital disharmony and love failure together formed 1/3rd of cases which is also suggested by other studies.^{46,47} In 11% of cases no specific reason could be found.

5. Conclusion

- Poisoning constituted less than 1% of total hospital admissions.
- Maximum intentional poisoning was found in 21 to 30 age group (47%).
- Males outnumbered females with the ratio of 1.2:1.
- Majority of the victims committed the act at their home.
- Insecticides were the most common agents used.
- Incidence was common among agriculture and related workers.
- Mortality in our study was 12.76%.
- 12.35% of the intentional self poisoning cases were discharged against medical advice.
- Incidence was most common during evening time, beginning or end of the month and rainy season.
- Fatality was mostly observed in married, Hindus, males, agriculture workers and with consumption of insecticides.
- Average duration of stay in the hospital was 3 to 4 days.
- Previous attempt of intentional self harm was observed in 5.5%.

Since this study is restricted to super specialty tertiary care corporate hospital, to apply these data on a larger population is risky. Intentional self poisoning cases still has a mortality rate of 13%. We need to work towards reducing this mortality rate. Socio-economic growth intertwined with a sound mental health can effectively tackle this menace. Problems of the student community need to be addressed more

aggressively than before. The complete overhaul of current education system which mainly focuses on getting grades and marks is the need of hour. Agriculture sector which is the lifeline of majority of Indian population should get its due from the government which has mainly focused on industrial growth. Rapid urbanization, unequal, uncontrolled and ill sustained growth, increasing rich poor divide, decreased morality and mental health are the problems of our society which have to be tackled with an iron hand. Poison information center and helpline for those who are in distress should be established in every region.

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