



A Prospective Observational Study in a Tertiary Care Teaching Hospital on the Trends and Outcomes of Poisoning Cases

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Abstract



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Developing countries suffer from significant morbidity and mortality making poisoning the global health problem with thousands of deaths occurring every year. In India, 70% of the land is occupied by Agriculture making farmers the worst affected which accounts for one-third of pesticide poisoning. Organophosphorus chemicals as well as purposeful self-ingestion of poison in an effort at suicide account for the majority of the significant burden of poisoning associated with morbidity and mortality. Enforcing the law correctly when it comes to the distribution and sale of addictive medications, establishing boundaries for electronic media when it comes to exposing people to harsh facts and raising societal awareness of the importance of education are essential objectives. Not only will it save countless lives, but it will also lower health budget costs by fighting and managing diseases in line with WHO targets in poor nations.

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INTRODUCTION

Mediaeval physician Paracelsus (1493–1541) asserted that everything is deadly and that nothing exists without poison, with the dose being the only factor separating something from being poisonous. The principle that "the dose makes the poison" was founded by him and is one of the most significant ideas in contemporary toxicology [1].

Any material, whether chemical or physical, that causes harm or even death to living things is considered a poison. Poisonous organisms are defined as living things that contain poison. These could be venomous or deadly plants or animals that can be found in or out of the water [2].

Although they have different meanings, the terms "venomous" and "poisonous" creatures are frequently used interchangeably. A poisonous organism employs its venom or poison to protect itself from predators, but a toxic organism is dangerous to eat [3].

Developing countries suffer from significant morbidity and mortality making poisoning the global health problem with thousands of deaths occurring every year. In India, 70% of the land is occupied by Agriculture making farmers the worst affected. It explains thirty percent of cases of pesticide poisoning. Organophosphorus chemicals and purposeful self-ingestion of poison in an effort at suicide account for the majority of the significant burden of poisoning associated with morbidity and mortality. It is crucial to understand the frequency, trend, and factors linked to the consequences of acute poisoning in these situations, as well as to recommend ways to make them better [4].

0.3 million people die every year due to various poisoning which was estimated by World Health Organisation (WHO). The major cause of Intentional deaths is Acute poisoning worldwide. In India, people with middle and Low Income have been recorded with majority of pesticide exposure due to increased use of agrochemicals in the agricultural sector [5].

In times of stressful situations people take the advantage of easy availability of pesticides to end their life. About 70% to 80% of Indian population depends majorly on agriculture making it highly susceptible to pesticide poisoning. For improved farming, farmers use pesticides very commonly as over the counter for agricultural purposes. The easy accessibility of pesticides paved the way for suicides [6].

The recorded details of the surveys signify Organophosphate poisoning cases being the highest although the rest covering with unknown poisoning. In rural population, majority of the accidental deaths occur due to Snakebite emerging as a serious problem worldwide mainly eventuating as a result of inadequate primary treatment and lack of tertiary care facilities [7].

The high incidences of poisoning and snakebite cases demands combating strategies for decreasing the occurrences of deaths. In order to

identify variables linked to outcomes in these situations and to recommend ways to reduce related morbidity and death, a prospective observational study was carried out [8].

MATERIALS AND METHODS

From April to October of 2023, this investigation was carried out. At AC Subba Reddy Government Medical Hospital, a Tertiary Care teaching hospital in SPSR Nellore, data was gathered from every case of poisoning and snakebite that was admitted during this time to the emergency and general wards [9].

All forms of chemical poisoning, snakebite, insect bites, scorpion sting, and drug poisoning were included in the group of patients who were older than eighteen. But the patients who were taken to the hospital already dead or who passed away before receiving any care, Patients with food sickness, paediatrics, unwilling participants, pregnant women, and anyone with drug allergies were not allowed to participate in the trial [10].

Statistics were used to document and analyse the data. Data were shown as percentages and figures. The data collection forms for patient data are organised using Microsoft Word. Spreadsheets with graphical patient demographic representation are created using Microsoft Excel. The information was gathered using a carefully thought-out, pre-structured proforma, or data collecting form. The type and quantity of poisoning, age, gender, educational background, status, religion, length of hospital stays, urban/rural location, mode of poisoning, depression, place of residence, patient occupation, time of hospital arrival, lag time to the hospital, and reasons for the same were all recorded. Information about the condition, any co-occurring diseases, prior poisoning history, the kind of poisoning (accidental or suicide), and any recent occurrences were also included [11].

The care received, including the specifics of when and by whom, was questioned of the patients and attendants. Records of any outside medical care, the environment, and the credentials of the treating physicians were examined [12].

The specifics of receiving treatment indoors; door-to-needle time, which is the interval between arriving at the hospital and starting the first treatment; the necessity of an antidote, along

with the reasons for its requirement; and, consequently, the availability of an antidote, whether obtained from the patient or from hospital supplies, were documented, as were the outcomes of poisoning victims [13].

RESULT

According to the work plan, the distribution of the cases based on their sociodemographic traits is shown. Patients with different poisoning cases totaling 113 were registered during the study period. Based on the number of poisoning cases reported, as indicated in Table 1, men (52.62%) outnumbered women (47.38%).

Table 1: Distribution of Patients based on Gender

Gender	No. of Patients	% Total
Male	62	52.62%
Female	51	47.38%
Total	113	100.00%

The age group of [21-32] year (38.51%) was common as shown in **Error! Reference source not found.** Organophosphate poisoning was highest with (22.12%). The next is Drug poisoning and Disinfectants (16.70%) and (14.16%) respectively as shown in the **Error! Reference source not found.** The most common mode of poisoning was Intentional (72.52%) and Accidental poisoning (27.58%) as shown in the **Error! Reference source not found.**

Table 2 Distribution of Patients based on their Age and Gender

Age (years)	Male	Female	Total
>15-19	10	13	21.24%
20-29	25	15	38.51%
30-39	13	10	17.51%
40-49	12	6	15.92%
>50	5	4	7.08%
Total	65 (52.62%)	48 (47.38%)	100.00%

According to the Socio-economic class data collected, the Poor class (78.68%) was highly affected followed by the Middle class (21.42%). There was no case registered in the High class, making the poor class the highly susceptible section. The poisoning in the married group (55%) dominated over the unmarried group (45%).

The most common cause of poisoning was recorded was due to Family problems (28.32%) following by other causes (23.01%). The other main reasons being Marital discord (19.47%) and financial difficulties (18.58%) were recorded among the patients as shown in **Error! Reference source not found.**Figure 1.

Table 3 Distribution of Patients based on Gender and Type of Poisoning

Types of Poisoning	Male	Female	Total
Organophosphates	12	12	21.12%
Scorpion sting	2	0	0.88%
Snake-bite	7	4	12.50%
Honeybee-sting	1	0	0.88%
Drugs	11	6	16.70%
Rodenticides	5	5	13.39%
Disinfectants	6	8	14.16%
Unknown bite	1	1	1.77%
Insecticides	4	4	8.73%
Cyanide	1	0	1.88%
Household products	2	7	7.96%
Total	52.62 %	47.38 %	100.00 %

Table 4 Distribution of Patients by the Type of Poison and Mode of Poisoning

Types of Poisoning	Intentional %	Accidental %	Total %
Organo phosphates	18	4	22.12
Scorpion sting	0	1	0.88
Snake-bite	0	8	11.50
Honeybee sting	1	2	0.88
Drugs	14	2	17.70
Rodenticide	12	1	12.39
Disinfectants	13	3	14.16
Unknown bite	0	2	1.77
Insecticides	6	3	9.73
Cyanide	1	0	0.88
Household products	7	1	7.96
Total	72.52	27.58	100

In the **Error! Reference source not found.**: FD-Financial difficulties, DP-Discord with parents, LJ-Loss of job, FP-Family problems, SDP-Separation or death of partner, MD-Marital discord, Assault (harassment), Other.

Most of the patients were recovered (91.64%) who were administered to the hospital within 2 to 4 hours and few expired cases (8.36%) mainly due to the increased lag time (>8hrs) as shown in the **Error! Reference source not found.**

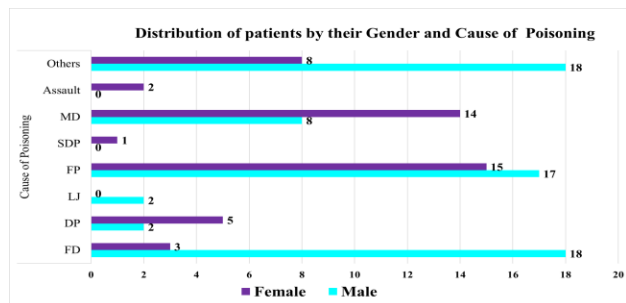


Figure 1 Distribution of Patients by their Gender and Cause of Poisoning

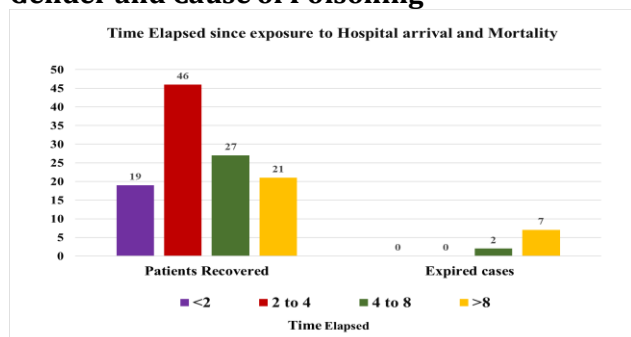


Figure 2 Time Elapsed since exposure to Hospital arrival and Mortality. [Lag-Time]

The majority of the poisoning cases were among the Rural population (61.70%) followed by the Urban population (38.30%). The leading group according to educational status were the illiterate population (53.21%) followed by people with secondary education levels (21.12%). Based on the occupational status the most common cases recorded were of Housewife (25.66%), Labor (22.12%), and Farmer (19.47%) as shown in the **Error! Reference source not found.**

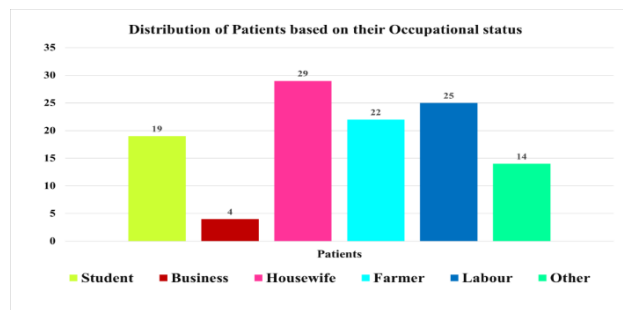


Figure 3 Distribution of patients based on their Occupational Status

DISCUSSION

113 poisoning cases were prospectively examined during the study period. In the modern world, poisoning is a widespread medical and societal issue that causes chaos. It wastes precious resources for health services and increases morbidity and mortality significantly.

In comparison to female poisoning cases (47.38%), the current analysis shows that there were more male poisoning cases (52.62%). With a male majority, the age group of (21-32) years accounted for 38.51% of the total number of patients in this study, followed by (30-39) years (17.51%). Additionally, a decline in cases was noted as ages increased.

Seventy-five percent of the instances were intentional poisoning, while the remaining twenty-seven percent were accidental poisoning. Because they are more likely to experience stress and pressure in their daily lives due to their occupation, males (42.48%) were more likely than females (32.75%) to intentionally poison others. 15.00% of males and 9.73% of females were affected by accidental poisoning.

Rat poisoning is most frequently caused by organophosphates (22.12%), drugs (17.71%), rodenticides (12.38%), and snake bites (11.50%). Drugs were employed in 20.74% of intentional poisoning cases, whereas agents including organophosphates were utilised in 26.84%. Out of all the cases of accidental poisoning, snake bites accounted for 41.95% of the cases. The most frequent causes of poisoning, according to this report, are drugs as well as pesticides. The distribution pattern of suicide cases reveals the youth population's impulsivity and mental susceptibility, particularly in males as opposed to girls. The research comes to the conclusion that a

higher number of people are committing suicide by using pesticides due to their high mortality rate, ease of access at reduced pricing, and general public perception that the poison causes a less agonising death.

Because of the hospital's improved management practices, the overall mortality rate in the current study was low at 7.38%. The middle class accounted for 21.42% of poisoning cases, with the poor class accounting for 78.68% of cases. These socioeconomic groupings indicate that social and financial issues may have a significant impact on these people's everyday life. Given that the study population's background is mostly agricultural, a considerable usage of insecticides and rodenticides as poisons is common in both urban and rural settings. The majority of suicide cases had depression linked to family problems (28.33%), marital problems (19.47%), and financial troubles (18.58%). Suicidal acts were influenced by a number of reasons, including a high level of stress in the social, financial, and academic spheres as well as a lack of options due to unfulfilled professional, educational, and socioeconomic goals.

It is evident that married people may experience higher levels of stress in their daily life than single people because poisoning was more likely in the married group (60%) regardless of gender. Successful therapy was greatly influenced by the patients' early admission to the hospital. Within less than eight hours of the incident, the patients who were admitted to the hospital earlier eventually recovered. Conversely, those admitted to the hospital after hours, or more than eight hours, were either dead when they arrived or died from severe organ damage. The amount of time that passes before a patient receives first help is closely correlated with mortality.

The majority of poisoning cases (61%), which were reported from rural regions, were followed by urban populations (38.30%). In comparison to the group with basic education, such as primary or secondary school, the number of poisoning incidents was higher among the illiterate group (53.21%). With only 10% of cases, the educational group with the least experience is high school. Homemakers were the group most frequently harmed by poisoning (25.66%), followed by labourers (22.2%) and farmers

(19.47%). 16.82% of the instances recorded involved students who were psychologically troubled, under pressure to perform well academically, and contemplated suicide.

SUMMARY

Based on the supplied data, the current study found that males experienced a higher rate of poisoning than females across all age categories. Most of the incidents involved those in the youth group, specifically those between the ages of 19 and 30. According to the current study, intentional poisoning is the most typical kind of acute poisoning. The key elements in acute poisoning that affect morbidity and death are the type of poison, the dose taken, the standard of medical care offered, the amount of time between poisoning and hospital arrival, etc. Most of the patients lacked literacy. It was discovered that rural communities had higher rates of poison intake. The majority of patients were housewives, then labourers and farmers.

The most commonly used poison for suicide intentions was organophosphate, followed by drugs and rodenticides. Regardless of gender, the married group experienced more poisoning, which suggests that married people may experience higher levels of stress in their daily life than single people. Reactive depression was linked to the majority of suicide cases. A high level of academic stress, unstable finances, social unrest, and the pressure to meet professional, educational, and financial goals all contributed to suicidal thoughts and behaviours. These factors also limited options, which increased mental stress and tension and led to rash, harmful decisions.

The reasons found for the death of poisoned people were delayed hospital admission, poor handling of the affected patients, and ignorance of the toxin and its counter-agent. In summary, the current study has succeeded in adding to the body of knowledge regarding the patterns and trends in poisoning epidemiology in tertiary care hospitals. To accomplish the total adjustments for better management and quality of life, particularly for the rural population, legislative and educational interventions are required.

CONCLUSION

In young guys, poisoning was more common. The two main causes of poisoning were drugs and organophosphates. The large number of poisoning cases that the emergency room saw could potentially be linked to the widespread availability of pesticides and other household toxins, the majority of which were self-inflicted injuries. The length of hospital stay and possibly death in cases of poisoning and snakebite may be decreased by taking the proactive steps noted in this study, such as presenting patients to the hospital early to minimise lag time and give prompt treatment at first contact. Toxic material awareness campaigns and appropriate counselling are needed for the rural population, where illiteracy is a major barrier to self-realization and self-actualization, in order to enhance their strengths and skills. Some of the goals that are due are proper law enforcement in the sale and distribution of addictive drugs, setting the boundaries of electronic media in the exposure to crucial facts, and developing awareness among the society for education.

In order to eradicate poverty in the developing countries the youth ought to be used in the employment to make them useful in the society by generating resources on a national level. Implementation of the ideas like Awareness programs to Improve social cognizance among the rural areas may lead to a better future in developing countries. It reduces the expenses of health budgets in combating and controlling the diseases according to the set goals of WHO and save the precious lives from being misspent.

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Conflict of Interest:

The authors declare no conflict of interest, financial or otherwise.

REFERENCES

- [1] Dhanya SP et al. A Retrospective Analysis of The Pattern of Poisoning in Patients Admitted to Medical College Hospital. Calicut Medical Journal 2009;7(2):3 edition. Mc Graw Hill New York. Pp-1238, 2000.
- [2] Bhoopendra sing, Unnikrishnan. A profile of acute poisoning at Mangalore (South India). jcfm2006; 13:112-116 9.
- [3] Jesslin J, Adepu R, Churi S. Assessment of prevalence and mortality incidence due to poisoning in a south Indian tertiary care teaching hospital. Indian J.Pharm. sci 2010;72(5):587-591.
- [4] Mannaim PF. Pattern of acute intoxication in Florence: A comparative investigation. Intensive Care Med. 1991; 17(1): 24-31.
- [5] Begum JA, Chowdhury MM. G Ara. A study of poisoning cases in four hospitals of Bangladesh. Bangladesh Med J. 1989; 18(2): 64.
- [6] Vinay B S, Gurudatta S, Pawar, Inamadaa P I. Profile of poisoning cases in district and medical college hospitals of north Karnataka. Indian journal of forensic medicine and toxicology. 2008; 2(2):07-12.
- [7] Suliman MI, Jibrán R, Rai M. The analysis of organophosphorus poisoning cases treated at Bahawalpur Victoria Hospital, Bahawalpur in 2000- 2003. Pak J med Sci 2006; 244-49.
- [8] Bertolote JM, Fleischmann A, Butchart A, et al. Suicide, suicide attempts and pesticides: a major hidden public health problem. Bull World Health Organ 2006; 84: 260.
- [9] RA. Environmental risks of insecticides cholinesterase inhibitors. Toxicol Int 2013; 20: 30-34.
- [10] Gunnell D, Eddleston M, Phillips MR, et al. The global distribution of fatal pesticide self-poisoning: systematic review. BMC Public Health 2007; 7: 357.
- [11] Das RK. Epidemiology of insecticide poisoning at A.I.I.M.S Emergency Services and role of its detection by gas liquid chromatography in diagnosis. Med Leg Update 2007; 7: 49-60.
- [12] Thomas M, Anandan S, Kuruvilla PJ, et al. Profile of hospital admissions following acute poisoning – experiences from a major teaching hospital in south India. Adverse Drug React Toxicol Rev 2000; 19: 313-317.

- [13] Taruni N.G., Bijoy T.H. & Momonchand A. (2001): A Profile of Poisoning Cases Admitted to RIMS Hospital, Imphal; J Forensic Med Toxicol, 18: 31-33.

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