

AN EPIDEMIOLOGICAL STUDY OF POISONING IN A TERTIARY CARE HOSPITALStephen Hormise¹, H. Sahajanand², R. Rangalakshmi³, Kasim Mohamed⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: AIMS: The aim of this retrospective study was to analyze the rate and characteristics of acute poisoning cases admitted to adult intensive care unit (ICU) in a tertiary care medical college hospital. We report clinical features, demographic data, laboratory results, mortality rate, and the results of our treatment in cases who came with the history of poisoning. **METHODS:** The study was done in patients admitted with history of poisoning under the department of medicine at RRMCH Hospital, Bengaluru from December 2013 to November 2014. This study includes 84 poisoning Patients who were admitted to ICU care. Detailed history, clinical examination and laboratory investigations were done in all patients. Ventilator support and supportive treatment was instituted to required patients as per our ICU criteria of intubation and Ventilation. Data was collected in structured format and analyzed. **RESULTS:** Majority of the cases were due to organophosphorus compound poisoning (n=47, 61%). Others had consumed drugs which included analgesics, carbomates, anti-hypertensive, spirit, benzodiazepines. Amongst these, 4 had consumed aluminum phosphide and all 4 of them died. In some history did not reveal the identity of the drugs. The most common indication for mechanical ventilation in these patients was respiratory failure due to OP poisoning. **CONCLUSION:** Pesticides were the main cause of poisoning (68.97%). The reasons being agriculture based economics, poverty due to poor agricultural yield and easy availability of pesticides. Patient education by conducting community based public awareness camps and lectures might also help in bringing down the incidence of poisoning. The mortality could be decreased by enhanced ICU care, better medical management, appropriate supportive therapy and further restrictions on the highly toxic pesticides.

KEYWORDS: Aluminum hydroxide, Organophosphorus, Mechanical ventilation.

INTRODUCTION: The word poison can be defined as "A substance that causes injury, illness, or death, especially by chemical means". Suicidal poisoning has become a common day-to-day event. Acute poisoning is also a common problem worldwide. WHO reports estimate poisoning either intentionally or accidentally as one of the common causes of increased morbidity and mortality rate. The incidence of poisoning worldwide is unknown. Half a million people die each year as a result of various kinds of poisoning, including. WHO conservatively estimates the high incidence of pesticide poisoning in developing countries. It has doubled during the past decade.¹ In the United Kingdom (UK) poisoning accounts for an estimated 10-20% of acute medical admissions and 5-10% of the workload of Accident and Emergency (A&E) department. However, in India the exact incidence is unknown as there is under reporting of cases of poisoning. In India there is no check on sale of poisonous materials and anybody can purchase them over the counter. Pesticides and different kind of drugs have been used for suicidal and accidental poisoning in different countries.²

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Acute poisoning due to agricultural pesticides is one of the common causes of intentional deaths worldwide as well as in Asian subcontinent with high density of rural population.³ High doses of analgesics, tranquilizers, and antidepressants are the commonly used agents for intentional poisoning in industrialized and developed countries.⁴ As agriculture is major profession in the rural part of India farmers stock the pesticides to eradicate the weeds and pests. Hence pesticides are commonly available and used for suicidal poisoning.⁵

We evaluated patients who came to our emergency room (ER) or later to ICU, with the possible history and diagnosis of poisoning. We hereby discuss the clinical social and demographic features of all these case.

OBJECTIVES:

- 1. Primary Objective:** In this retrospective study we analyzed the rate and characteristics of acute poisoning cases admitted to emergency room and adult intensive care unit (ICU).
- 2. Secondary Objective:** To report the demographic data, laboratory results, clinical features of poisoning cases, mortality rate, complications and our treatment modalities.

MATERIALS AND METHODS: After obtaining no objection certificate from the Institutional Ethical Committee the study was undertaken in patients who were admitted with history of poisoning in the department of medicine RRMCH Hospital, Bengaluru from December 2013 November 2014. This study include 84 poisoning Patient who came to ER and were admitted to ICU care. The nature of the poison, exposure and the diagnosis was based on information obtained either from the patient or from the patient's family members and friends. Demographic features included age and gender, marital status, education level, economical status, suicidal purpose, and demographic region. In addition, type of poisons, follow up times and clinical symptoms were recorded. After establishing IV access, gastric lavage was done in all cases except corrosive agents. Specific antidotes were given when indicated. Forced diuresis was used to augment elimination of renally excreted poisons, metabolites or toxins. In the event of hypotension or shock, Central vein was cannulated and central venous pressure (CVP) was monitored. Intravenous fluids were administered according to the CVP, which was combined with vasopressors like dopamine or dobutamine infusion to maintain the systolic blood pressure. Oxygen was given immediately with the monitoring of respiratory effort, pulse oximetry and arterial blood gas (ABG), if respiratory distress was present. OP compound poisoning was treated with Pralidoxime (PAM) 500mg three times a day for 3 days. Atropine was given as 2mg bolus intravenously and as an infusion titrated according to the response. Complete blood counts, renal function tests, liver function tests, electrolytes, Serial ABG and appropriate investigations were done as indicated.

The indication for endotracheal intubation and mechanical ventilation were as follows: excessive secretions; a depressed level of consciousness as per the Glasgow coma score, poor gas exchange as shown by the ABG report, which was unresponsive to oxygen treatment; cardio respiratory arrest; and severe metabolic acidosis with hemodynamic instability (systolic blood pressure <70 mm Hg). Weaning protocol for mechanical ventilation was carried out with spontaneous breath count, pressure support weaning and T-tube trials. If the poisoning resulted in suicidal attempt psychiatric consultation and supportive care were performed during and after ICU treatment. Time of arrival in the ER to need of ICU care, Hospitalization time, duration of ventilator support and morbidity and mortality rate were all recorded.

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RESULTS: We recorded 84 cases among. Almost half of these belonged to the age group of 17-30 years with an average age (27-40) years. The frequency declined as the age advanced. (Table 1) Males outnumbered females (Table 2). 52 were males (71.23%) and 32 were females (28.4%). 66.67% belonged to the lower socio economic strata And the rest were from middle income group. we did not record any patients coming from high socioeconomic group. 50 patients came from urban area while 34 were from rural settlement (Table 3). Among these 44 patients 54.3%were referred from other hospitals.

Age in years	Number of patients	%
17-20	22	26.01%
21-30	32	38.09%
31-40	14	16.66%
41-50	6	7.14%
51-60	6	7.14%
>60	4	4.76%
Total	84	100.0

Table 1: Demographic data

Gender	Number of patients	%
Male	52	71.23%
Female	32	28.76%
Total	84	100.0

Table 2: Gender Distribution

Class of people	No. of patients	Percentage
Rural	34	40.47
Urban	50	59.52
Total	84	100

Table 3: Rural/urban

36.9% patients presented to our hospital within 1-2 hours consuming poison (Table 4). And all of them were shifted to ICU within 30 minutes.

The following table shows the time taken by the patients to be brought to the hospital.

Time to reach hospital	No. of Patients	% age
1-2	31	36.9
3-5	36	42.85
>6	13	15.47
1-2days	3	3.57
3-5Days	1	1.19
Total	84	100

Table 4

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All the patients had consumed the poison orally (Table 5) and all with suicidal intent. We recorded 12 different types of poisoning agents. Organophosphorus compound poisoning (n=47.61%) leads the Table. 9.2% of patients had consumed 2 to 3 varieties of drugs which included analgesics, amitryptilne, decongestents anti-hypertensives,. 3 of them had overdosed on benzodiazepines. However all of them recovered. 4 had consumed aluminium phosphide and all 4 of them died. Most of them presented with nausea, vomiting pain abdomen and altered sensorium.

Diagnosis / Type of poison	Number of patients (n=84)	%
OPCP	40	
Carbamates	4	
Antihypertensive drugs	2	
Multiple drugs	8	
Unknown Tablets	12	
Sleeping pills	3	
Aluminium phosphide	4	
Rat poison	10	
Spirit	1	
	84	

Table 5: Type of Poison consumed

50% of OP poisoning patients had excessive secretions and 25% had fasciculations. Low Cholinesterase levels correlated positively with mortality. The most common indication for mechanical ventilation was respiratory failure which mainly consisted of OP poisoning, 29.76% were ventilated. The mean duration of ventilation was 5 days. After 2 days of admission 21 patients underwent tracheostomy. ICU stay was longer for those with OP poisoning. PT and APTT were increased with rodenticides poisoning. They were treated with fresh frozen plasma. None of the phenol poisoning had corrosive injuries. Of the 84 patients 7 patients (8.33 %) developed ventilator associated pneumonia. Out of 84 patients, 8 patients died (9.5%).

DISCUSSION: Poisoning is a common problem worldwide mainly due to increasing work stress and life style changes. People tend to develop depression and suicidal tendencies. Hence the incidence of self-poisoning is increasing. It is important to know the socio demographic trend and substances commonly used in the area. Patients presented with clinical scenarios ranging from overdose of drugs intake or exposure to toxic materials, illicit use of drugs, suicidal attempts, or accidental exposure. At times it is challenging to the most experienced clinicians, when patients present with altered mental status and there is no history of intoxication. Patients with specific toxic symptoms are tackled easily, but symptoms are often non-specific and may be masked by other conditions.

In our study males were greater than females. These findings were comparable with the previous studies. The high incidence in males may be because of stress, strain and occupational hazards compared to females.^{6,7,8} In our study patients between 21-30 years were more affected followed by the age group between 31- 40 years. Thus, young adults are at more risk than the older people. Those living in more urbanized areas are at a higher risk of suicide than their counterparts in less urbanized areas probably because of life style and pressure. Globalization and urbanization has

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caused the people to migrate from the other districts, states and villages which causes increase of population. The urban people have lot of business failure and social problems.

58.3% of Bangalore's population live in municipal areas. All our patients had consumed poison with suicidal intent. This is in accordance with other studies.^{9,10,11} The probable cause of death is based on history given either by police or and relatives. High suicide rate in urban areas is influenced by exposures to risk factors of suicide compared to others in rural areas. The suicides may be due to financial factors, social causes, family problems, low level of education and other aspects of life.

Easy availability of poisons is the most important contributing factor. The majority of suicidal attempt (59.2%) occurred in the urban area. Incidence of poisoning was more in low social economic people. This can be explained as the majority of Indian population live in rural areas with low income. Pesticides were the major cause of poisoning (40%). The reasons being agriculture based earning by the villagers, poverty and easy availability of pesticides. Occupational poisoning due to pesticides are also common in developing countries, due to unsafe preventive practices, illiteracy, ignorance, lack of protective clothing. This is comparable with other studies.¹² However in north India the incidence of aluminum phosphide poisoning is more¹³ compared to South India. Patients who had consumed rodenticides & carbonates' were on ventilator support for less number of days, with very high mortality as compared to patients who had consumed OP or phosphides.

CONCLUSION: In this hospital-based study, these data provide important primary information on the pattern of symptomatic poisoning in our place. It is similar to the findings of the other studies¹². Younger patients are more vulnerable for poisoning and OP agricultural pesticides were most commonly involved. The poisoning related mortality could be decreased by timely ICU interventions and appropriate supportive care.

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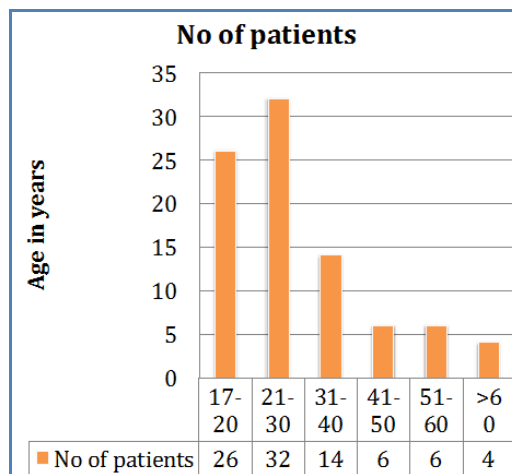


Fig. 1: Age of the patients

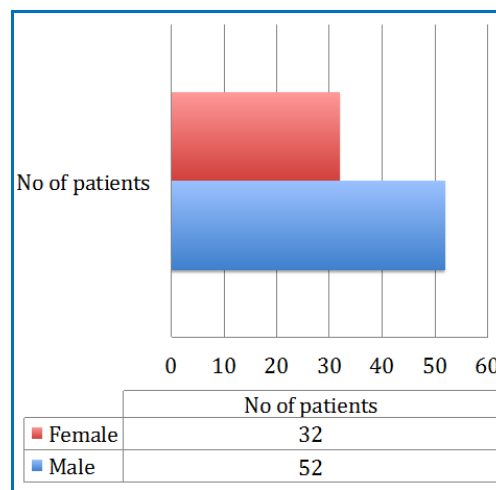


Fig. 2: Gender distribution of the patients

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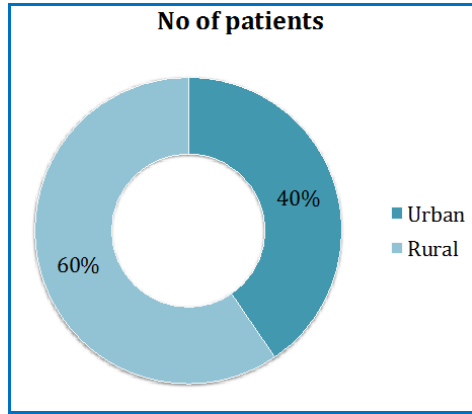


Fig. 3: Demography: Rural V/S Urban

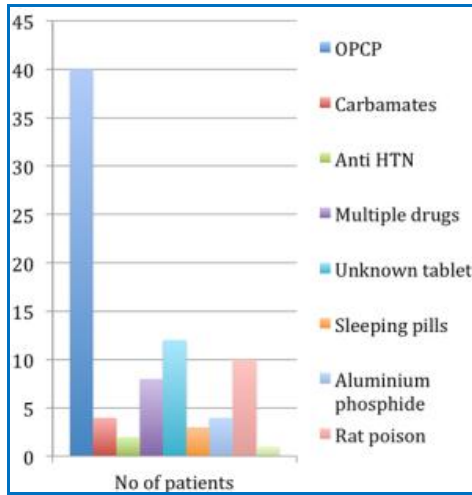


Fig. 4: Incidence of Poisoning

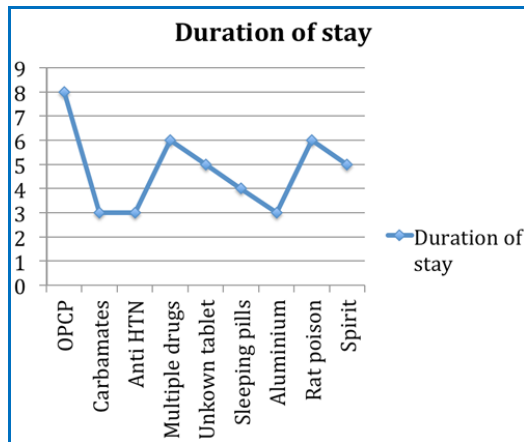


Fig. 5: Duration of ICU stay

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