Clinical Profile of Poisoning Cases Admitted in Intensive Care Unit of a Rural Tertiary Care Hospital in Karnataka during COVID 19 PANDEMIC; A Hospital based observational Study

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Abstract
Background:
Acute Poisoning is one of the major cause of medical emergency reason for attending casualty of hospital, and it's one of the common causes of ICU admission, accounting for significant morbidity and mortality in developing countries like India
AIMS:
To Describe the Clinical profile of subjects admitted to a rural tertiary care hospital ICU with history of poisoning.
Materials and methods:
Epidemiological, clinical, laboratory, treatment data were obtained with data collection forms from medical records and history given by 60 poisoning subjects admitted in the month February 2021 and March 2021 medical ICU of AH & RC AIMS BG Nagara Mandya Karnataka India
Statistical Analysis:
Collected Data during study was analyzed by using descriptive and inferential statistical methods: percentage, mean and standard deviation (SD). A two tailed P < 0.05 was considered to be statistically significant.
Results:
A total of 60 subjects admitted to Medical ICU of AH & RC AIMS BG Nagara Mandya Karnataka India with History of Poisoningduring COVID 19 pandemic were included in the study.
The Male subjects -31, (51.66%) were more in number compared to female's-29 (48.33%) and most had age < 50 years (46, 76.66%). Majority of the subjects were farmers, followed by housewives, laborers, students. Poisoning with suicidal intent (86.66%) was more frequent than accidental (13.33%).
Majority of acute poisoning was due to Non organophosphorus compounds (34, (56%), pyrethroids (31.66%), followed by tablet consumption (25%) and organophosphorus compounds (8.33%)
The mean time interval between poisoning and admission to hospital was 6.7 hours. subject having delayed presentation to hospital had higher mortality and morbidity compared to subject presenting early.
Average Duration of hospital stay was around 4 days, subjects with history of consumption of Organophosphorus compound and Rodenticide had longer hospital stay compared to non-organophosphorus compound consumption subject. Two out of 60 subjects had succumbed due to poisoning.
Poisoning with suicidal intent was more frequent than accidental.
Conclusion:
Acute poisoning is a major health-care problem with a significant morbidity and mortality especially in rural parts of India.
The current study showed that most of the poisoning cases involved young subjects and also it was evident that early presentation to hospital significantly reduces morbidity and mortality.
Poisoning cases accounted for significant number of intensive care unit hospital admissions even during the current covid 19 pandemic leading to more burden on healthcare system, emphasizing the need for health education of youth and rural population so as to decrease the burden on health care system during the ongoing Heathcare crisis and efficient utilization of heath care facilities.

I.   Introduction

Acute poisoning is one of the major causes for medical emergency, subjects attending casualty specially in the rural areas of India, contributing to significant morbidity and mortality. Most of the poisoning is due to the intension of deliberate self-harm.[1] Accidental and occupational exposure to the pesticides leading to poisoning have been seen in farmers and children.[2] Agricultural pesticides like organophosphorus, organochlorin, pyrethroid compounds, rat poison preparations containing zinc or aluminum phosphide, drugs such as paracetamol, opioids, benzodiazepines, tranquilizers, antithyroid, antihypertensive medications are commonly used substances in acute poisoning due to their easy availability and accessibility.

The World Health Organization (WHO) have reported that around 0.3 million people die due to the various acute poisoning annually, out of which 200000 deaths are due to organophosphorus poisoning alone. [3,4]

The epidemiological factors such as geography, occupation, socioeconomic status, literacy rate, and cultural and religious practices can influence the clinical presentation and outcome of the poisoning. This urges the need for periodical study for understanding the pattern of poisoning in a specific geographical area. Poisoning subjects with the evidence of organ failure require admission to the intensive care unit (ICU) for organ support and specific management. There are various clinical entities that can determine the clinical course and outcome in the ICU. Besides the type of poison, delayed presentation and multi-organ failure that require immediate advanced life support organ can lead to high mortality. [5,6]

The rural areas of India, Karnataka has wide variation in socioeconomic status and cultural and religious practices, has agricultural land and many farmers, Laboure workers, there have been many incidences of poisoning reported all throughout the year. And few studies have been conducted relating to clinical profile of poisoning,

This study has been conducted with the objectives of evaluating clinical profile of poisoning subject admitted to intensive care unit specially during first wave of covid 19 pandemic in order to emphasize the impact of such poisoning cases on health care system in this pandemic heath care crisis in rural part of India.

II.   Materials And Methods

This was a hospital based prospective observational study at ICU of tertiary care hospital in Karnataka during 1st wave of covid 19 pandemic, February – march 2021. Epidemiological, clinical, laboratory, treatment data were obtained with data collection forms. Data from medical records of admitted subjects in the month ofFebruary and March 2021 to medical ICU of Adichunchanagiri hospital and research center, AIMS BG Nagara Mandya district, Karnataka India were included.

The study included all cases of suspected acute poisoning admitted to AH&RC ICU. Subjects who got discharged, referred, left against medical advice or died within 24 h of ICU admission were excluded from the study. Immediately after admission, a detailed clinical history was taken and necessary therapeutic intervention was started without delay after a thorough clinical examination to stabilize the subjects. Attempt for the prevention of the toxin absorption (gastric lavage and activated charcoal) was continued or started (if not started from the emergency department) in the subjects presenting within 4-6 h of poisoning. Routine investigations like Complete blood counts, renal function test, liver function test including coagulation profile, serum electrolytes, random blood sugar, pseudo choline esterase levels and toxicology screen for urine were routinely done for all the subjects included in the study. Subjects were managed with supportive treatment and also with specific antidote if indicated.

Data regarding demographic profiles including age, sex, education-level socioeconomic status, and premorbid conditions were recorded from the subject or subject relatives. The information regarding the drug included the type of drug, route of ingestion, intention of poisoning, and duration of the first visit to the hospital. The type of poison was confirmed from the clinical presentation, circumstantial evidence, and the remaining container or packets brought by the subject's relatives. The clinical profile of the subjects was assessed by recording Glasgow Coma Score (GCS) and Sequential Organ Failure Assessment (SOFA) score at the time of ICU admission, need for mechanical ventilation, need for vasoactive drugs, acute renal failure requiring renal replacement therapy, hepatic failure, and coagulopathy.

The subjects were grouped into organophosphorus and non organophosphorus group. Although the organophosphorus and organochlorine compounds both are commonly used pesticides for agricultural purpose, the management of these two poisonings is different. The various clinical variables were compared between the two groups. The outcome of the subjects was studied by assessing need for mechanical ventilation or any organ failure, duration of mechanical ventilation, duration of ICU stay, and mortality in the ICU.

All the subject data were recorded in Microsoft Excel and IBM SPSS statistics version 23 (Armonk, New York: IBM Corp) was used for data analysis. The study included continuous, discrete as well as categorical data. The continuous data were presented as mean and standard deviation while categorical data were presented as frequency and percentage. Chi-Square test and Mann–Whitney test were used for the analysis of categorical

and continuous variables, respectively. Those variables, which were significant in the bivariate analysis, were subjected to the multivariate analysis. The stepwise backward logistic regression was used to find the adjusted effect of variables contributing mortality. $P < 0.05$ was taken as statistically significant value.

III.   Results
A Total of 60 subjects with suspected or diagnosed acute poisoning due to various substances were included in the study.

The demographic profile and subject characteristics are illustrated in table 1. The Male subjects -31, (51.66%) were more in number compared to female's-29 (48.33%) and most had age < 50 years (46, 76.66%).

Table 1. the demographic profile and subject characteristics

Subject Variables	n(%)
Age (years)	
<20 years	5
20-30	22
30-40	16
40-50	8
>50	14 (23.33)
Gender	
Male	31(51.66)
Female	29 (48.33)

The poisoning characteristics including mean time for exposure to the hospital, route of poisoning, and intention of poisoning are demonstrated in Table 2. In majority of the cases, the poisoning was ingested orally with the suicidal intention due to the suicidal attempt.

Table 2. The poisoning characteristics

Variables	Values
Average time from exposure to hospital visit	6.7 hours
Intension of poisoning	
Accidental	08
Suicidal	52
Homicidal	00

The various types of compounds were used for poisoning are shown in the table 3, Substances/Compounds used were broadly divided into Organophosphorus and Non organophosphorus compounds, others include drugs. Majority of acute poisoning was due to Non organophosphorus compounds (34, (56%), pyrethroids (31.66%), followed by tablet consumption (25%) and organophosphorus compounds (8.33%)

Table 3- The various types of compounds used for poisoning

Type poison compound	Value
Non-OP Compound	34 (56)
Pyrethroids	19 (31.66)
Organochlorins	11 (18.33)
Zinc and Yellow phosphorous	4 (6.66)
Organophosphorus compounds	11 (18.33)
Others-Drugs (Tablet consumption)	15 (25)

Subject's outcome, mortality, morbidity and average duration of hospital stay was dependent on the type of compound consumed and other associated comorbid condition and time from the poisoning to visit to hospital, subject having delayed presentation to hospital had higher mortality and morbidity compered to subject presenting early.

Average Duration of hospital stay was around 4 days, Organophosphorus compound and Rodenticide consumption subject had longer hospital stay compared to non-organophosphorus compound consumption subject. Two out of 60 subjects had succumbed to death due to poisoning.

IV.   Discussion
Acute poisoning is a major health-care problem with a significant morbidity and mortality especially in rural parts of India. It is a common medical emergency in the developing countries like India where pesticides and insecticides are in easy access to the population. The prompt diagnosis and appropriate management is necessary for better outcome. However, the diagnosis and management can be challenged and complicated by

the wide variation in the pattern of poisoning which depends on the various factors such as geographical area, socioeconomic status, literacy rate, age and presence of various comorbid conditions.[7,8]

The mean age of presentation in the present study was comparable to the studies done by Zaheer *et al*., Gannur*et al*., and Nigam *et al*. where majority of the subjects with acute poisoning presented within the age group of 16–30 years.[9,10,11] The young age presentation could be due to the fact that this age group was the most active age with a lot of personal and social responsibilities related with the personal career issues, studies, love affairs, and parental expectations.

The finding that the oral route being the most common route of poisoning and suicidal intention being the most common mode of poisoning was also observed by Ahuja *et al*., Das, and Padmanabha *et al*.[12,13]

The duration of presentation to the hospital is an important factor to determine the clinical course and outcome. The subjects presenting to the first health-care service within 2 h of acute poisoning have least morbidity and mortality. [14] The delayed presentation of the subjects in our study might be due to the various reasons such as delayed recognition of the victim after ingestion of the poison, difficult assess to the transport facility, or difficult access to the health-care centers. Delayed presentation after 4 h was also found by the work done by Ahuja *et al*. where they had mentioned that delayed initiation of resuscitative measures could be the possible contributing factor for the high mortality in their subjects. [12]

The duration of ICU stay was significantly longer in subjects with organophosphorus poisoning. The longer duration of mechanical ventilation in organophosphorus poisoning as observed in the study (though statistically nonsignificant) and the intermediate syndrome in this group of the subjects might have contributed longer duration of ICU stay. Pulmonary complications such as increased secretion, pneumonia, and acute respiratory distress syndrome are frequently seen in subjects with organophosphorus poisoning which leads to longer duration of stay in ICU. [15]

V. Conclusion

The current study showed that most of the poisoning cases involved young subjects and also it was evident that early presentation to hospital significantly reduces morbidity and mortality.

Poisoning cases accounted for significant number of intensive care unit hospital admissions even during this covid 19 pandemic leading to more burden on healthcare system, emphasizing the need for health education of youth and rural population so as to decrease the burden on health care system during the ongoing Heathcare crisis and efficient utilization of heath care facilities.

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