Clinical profile, outcome and patterns of acute poisoning among rural patients in North Karnataka: A hospital record based case series study

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Abstract

Background: Acute Poisoning in developed countries has a mortality of 1-2% while in India it varies between 15-30%. Suicide contributes to nearly 500,000 deaths in rural Asia. Mortality depends on the severity of poisoning, time from exposure to presentation to hospital, duration of hospital stay etc. Insecticide related poisons are freely available in rural setup and there is a need for regulations, strategies and awareness to curtail the problem.

Aim: To study the proportion of Acute Poisoning among patients in a tertiary care hospital in North Karnataka and to identify the causes, determinants, patterns and final outcome among patients presenting with acute poisoning.

Methods: This is a hospital record based case series study conducted on 70 patients of acute poisoning admitted to Emergency Ward and MICU of General Medicine of a tertiary care hospital in North Karnataka. Data was entered in Microsoft excel and was analyzed using SPSS software version 19. Chi square test was applied for proportions. P<0.005 was be considered as statistically significant.

Results: Of the total 70 patients included in the study acute poisoning with Organophosphate compound (OP) was 31.4% followed by Amitraz (18.57%), corrosives (8.57%), pyrethroids (7.14%) while rat poisons and paracetamol being 5.71% each. Poisoning among men was greater than among women. Outcome parameters of hospital stay, ventilator requirement, complication were significant ($p < 0.001$).

Conclusion: Insecticide related compounds are commonly chosen in rural areas as it is low cost and easily available owing to farming related practices. There is a need to understand the underlying socioeconomic factors responsible for acute poisoning in our population, and, accordingly, address the problem by changing farming practice, counselling & psychotherapy.

Keywords: Acute poisoning, Patterns, Outcome, OP compound, Amitraz, Sedatives

Introduction

Acute Poisoning, a therapeutic emergency is an important health problem in developing countries[2]. According to World Health Organization (WHO), globally there are more than three million cases reported with nearly 2,20,000 deaths occurring annually. The rate of mortality in India varies between 15-30%[1]. Most of the fatalities are due to the victim not reaching the hospital in time. Each ye arsuicide contributes to nearly 500,000 deaths in rural Asia of which 200,000 are due to self-organophosphate (OP) poisoning[5]. The medical management of poisoning emergencies is difficult and, till date, there are no clear-cut evidence-based guidelines for the best management of OP poisoning[6]. Acute poisoning due to drugs is the second most common mode of suicide after pesticides. In developing countries, the fatality rate is 15-times higher than in industrialized countries[7]. The Duration of hospital stay, ventilator requirement and duration, type of poison and the quantity, co-morbid conditions, clinical complications are some of the major determinants of outcomes in patients who present to emergency department with acute poisoning. Regulations, educational awareness and poison information centres can help to reduce the growth of this public health problem. Some strategies like reducing the use and availability of pesticides, formulating guidelines, ensuring safe use initiatives,

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changing farming practice along with counselling and psychotherapy could help curtail the problem.

Objectives

1. To study the proportion of Acute Poisoning among patients in a tertiary care hospital in North Karnataka.
2. To identify the causes, determinants, patterns and final outcome among patients presenting to tertiary care hospital with Acute Poisoning

Materials and Methods

This is a hospital record based case series study conducted on patients of acute poisoning admitted to Emergency Ward and MICU of General Medicine department from February 2020 to November 2020, after obtaining institutional ethical clearance (SNMC/IECHSR/2020-2021/A-15/1.1) and patients consenting to participate in the study. A total of 70 patients were carefully selected after fulfilling the inclusion and exclusion criteria as mentioned below. Sample size estimation was done using openepi software version 2.3.1. At 95% confidence level, and 80% power of the study, according to the study conducted by Anthony L et al 2012[2] titled 'Patterns of poisoning and drug overdose and their outcome among in-patients admitted to the emergency medicine department of a tertiary care hospital'.The Proportion of acute poisoning patients was found to be 42.7%=p

At 12%, Relative precision,Sample size estimated is 66 = 70.Formula used n= [DEFF*Np(1-p)]/ [$(d^2/Z^2_{1-\alpha/2}$*(N-1)+p*(1-p)]

Data was entered in Microsoft excel and was analyzed using SPSS software version 19. Chi square test was applied for proportions. P<0.005 will be considered as statistically significant.

Inclusion criteria: Patients above 15 years with evidence of Acute Poisoning who present to emergency department

Exclusion criteria: History of Snake Bite, Scorpion sting, Altered sensorium etc., other than that due to Acute Poisoning.

Results

Table 1: Sociodemographic Factors of Study Population

Sociodemographic factors		No of Cases	Percent
Age	0 20	5	7.1
	21-30	16	22.9
	31-40	20	28.6
	41-50	20	28.6
	51-60	9	12.9
Gender	Male	45	64.3
	Female	25	35.7
Place	Rural	59	84.3
	Urban	11	15.7
Marital Status	Single	15	21.4
	Married	55	78.6

Table 1 represents the age wise sociodemographic factors of a total of 70 patients who presented with acute poisoning to casualty of tertiary care hospital in North Karnataka. Among which 45 (64.3%) were Males and 25 (35.7%) were females. People from rural areas were significantly higher n= 59 (84.3%) and 21.4% of the study participants were unmarried.

Fig.1 :Patterns of Acute Poisoning among study population

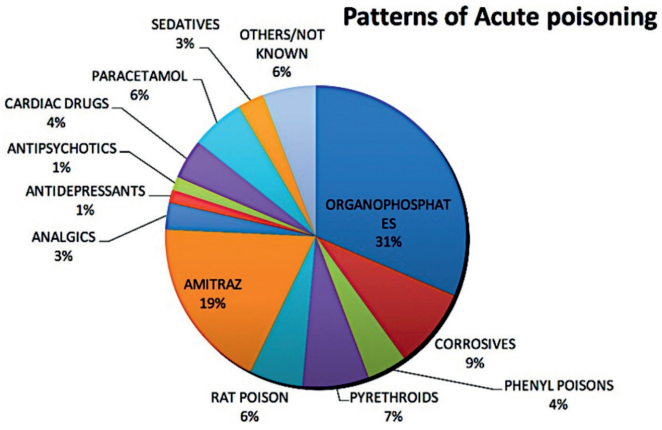
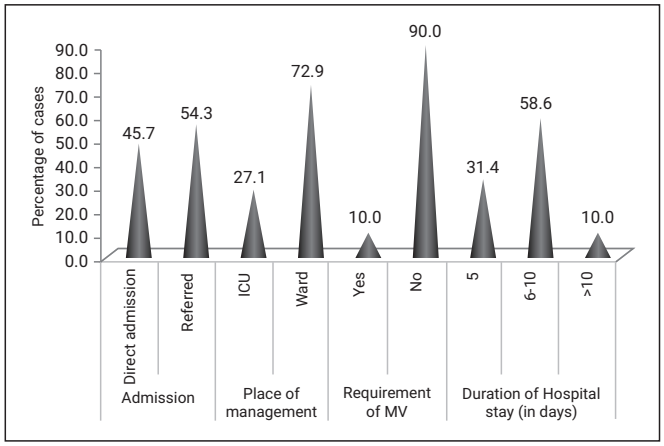


Figure 1 shows the patterns of acute poisoning among study samples. We noted that maximum n=22 (31.4%) were due to Organophosphate compound (OP) followed by Amitraz (18.57%), corrosives (8.57%), pyrethroids (7.14%), rat poisons and paracetamol being 5.71% each. Our study showed that 64 patients (91.4%) had suicidal intent with route of administration being oral. The remaining 6 (8.6%) had accidental inhalational exposure at workplace, all attributed to organophosphate compound. A total of 38 patients were referred from primary and secondary hospitals while the time from exposure to presentation at casualty was 7±5 hours as depicted in table[2]

Figure[2] shows the treatment related factors and patient outcome. Of the total of 70 patients 51 (72.9%) were admitted to emergency ward while 19 (27.1%) were admitted to Intensive care unit where 7 (10%) required invasive mechanical ventilation of which 2 patients succumbed to death each being due to multiorgan dysfunction and ventilator associated pneumonia secondary to OP compound poisoning.

Fig. 2 : Treatment Outcome among study participants



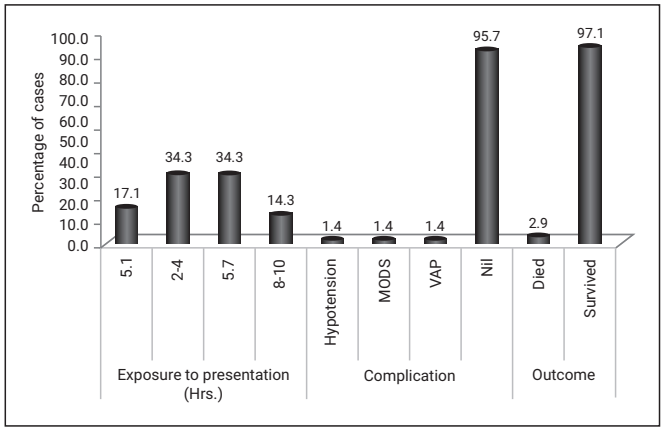


Table 2 : Comparison of patient characteristics and treatment outcomes among ward and ICU patients

Parameters		ICU	Ward	Chi Square Test
Age	< 20	0	5	0.364, Not Sig
	21-30	3	13	
	31-40	5	15	
	41-50	8	12	
	51-60	3	6	
Gender	Male	13	32	0.659, Not Sig
	Female	6	19	
Place	Rural	17	42	0.375, Not Sig
	Urban	2	9	
Marital Status	Single	0	15	P<0.004, Highly Sig
	Married	19	36	
Exposure to presentation (Hrs.)	< 1	3	9	0.447, Not Sig
	2-4	4	20	
	5-7	8	16	
	8-10	4	10	
Requirement of MV	Yes	7	0	P<0.001, Highly Sig
	No	12	51	
Duration of Hospital stay (in days	5	1	21	P<0.001, Highly Sig
	6-10	11	30	
	>10	7	0	
Complication	Hypotension	1	0	P<0.03, Sig
	MODS	1	0	
	VAP	1	0	
	Nil	16	51	
Outcome	Died	2	0	P<0.01, Sig
	Survived	17	51	

Discussion

Acute Poisoning in developed countries has a mortality of 1-2% while in India it varies between 15-30%[1]. The results of the present study show that acute poisoning still remains a major public health problem.

Our study results were consistent with those demonstrated by Anthony L et al 2012[2] wherein men (64.2%) outnumbered women (35.7%). While Ranjith KG et al[3] and Anthony L et al 2012[2] showed that most patients from rural backgrounds sought pesticide based chemicals (4.5%) as compared to urban areas and this may be attributed to the fact that pesticides are more freely accessible. Some of the issues highlighted are related to unemployment, poverty, marital conflicts etc. as described by Yurumez Y 2007[9].

The outcome of our patients is multifactorial and would have been grave if time had lapsed in seeking medical attention. Though aluminium phosphide poisoning (Rat Poison) has a reported mortality of as high as 31% in studies like Anthony L et al 2012[2] of the 4 cases admitted 1 had deranged LFT with prolonged ICU stay of 7 days but didn't require invasive mechanical ventilation while of the 22 organophosphate compound poisoning cases admitted to ICU, 6 were intubated had prolonged hospital stay of more than 2 weeks. One case of poisoning with cardiac drugs (calcium channel blocker and beta blocker) had prolonged ICU stay which was attributed to the need for inotropic support, close monitoring, plasmapheresis. Most of the drug based poisonings were managed conservatively and patients were discharged within 3 days of admission.

From our study we found that the duration of hospital stay, ventilator requirement and duration, type of poison and the quantity, comorbid conditions, clinical complications are some of the major determinants of outcomes in patients with poisoning.

Limitation of the study: Low number of patients, no follow-up, reduced statistical power, complications of invasive ventilation, hospital-acquired infections.

Conclusion: Insecticide related compounds are commonly chosen in rural areas as it is low cost and easily available owing to farming related practices. Mortality depends on the severity of poisoning, duration

of the mechanical ventilation, and ICU stay, as well as the delay in starting medical treatment. There is a need to understand the underlying socioeconomic factors responsible for acute poisoning in our population, and, accordingly, address the problem to reduce their incidence. Hence Regulations, educational awareness and poison information centres and strategies like reducing the use and availability, ensuring safe use initiatives, changing farming practices, counselling and psychotherapy could help curtail the problem.

References

1. *Rajarathna K et al. Pattern and pharmacotherapy of acute poisonings presenting to a tertiary care centre. International Journal of Basic and Clinical Pharmacology. 2017;6(4):879.*
2. *Anthony L, Kulkarni C. Patterns of poisoning and drug overdosage and their outcome among in-patients admitted to the emergency medicine department of a tertiary care hospital. Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine. 2012 Jul;16(3):130.*
3. *Ranjith KG, Nagabhushana S, Ranganatha M. Clinical pattern and outcome of organophosphorus compound poisoning. Journal of Evolution of Medical and Dental Sciences. 2016 Jun 13;5(47):3030-4.*
4. *Dhooria S, Agarwal R. Amitraz, an underrecognized poison: A systematic review. The Indian Journal of Medical Research. 2016 Sep;144(3):348.*
5. *Chowdary AN, Banerjee S, Brahma A, Biswas MK. Pesticide poisoning in non fatal, deliberate self-harm: A public health issue. Indian J Psychiatry 2007;49:117-20*
6. *Eddleston M, Buckley NA, Eyer P, Dawson AH. Management of acute organophosphorus pesticide poisoning. Lancet 2008;371:597-607*
7. *Eddleston M, Gunnell D, Karunaratne A, de Silva D, Sheriff MH, Buckley NA. Epidemiology of intentional self poisoning in rural Sri Lanka. Br J Psychiatry 2005;187:583-4*
8. *Konradsen F, van der Hoek W, Cole DC, Hutchinson G, Daisley H, Singh S, et al. Reducing acute poisoning in developing countries— options for restricting the availability of pesticides. Toxicology 2003;192:249-61.*
9. *Yurumez Y, Durukan P, Yavuz Y, Ikizceli I, Avsarogullari L, Ozkan S, et al. Acute organophosphorus poisoning in university hospital emergency room patients. Int Med J 2007;46:965-9.*

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