STUDY OF CLINICAL SPECTRUM OF HOSPITALIZED PATIENTS OF POISONING

General Medicine

Gawande G.D	Assistant professor, Department of medicine, B.J.GMC Pune
Manjrekar H.M	Associate professor, Department of medicine, B.J.GMC Pune
Redewad N.K*	Assistant professor, Department of medicine, B.J.GMC Pune *Corresponding Author
Kadam D.B	Ex. HOD & Professor, Department of medicine, B.J.GMC Pune
Sangle S.A	HOD & Professor, Department of medicine, B.J.GMC Pune

ABSTRACT

Introduction- Poisoning is the **4th common cause** of mortality in India. About 50,000 deaths occur every year in India due to poisoning alone. According to **National Crime Records Bureau, Ministry of Home Affairs** Government of India In 2015, 37,232 people died of poisoning. Everyday almost 700 people die from poisonings in the world. Out of which 102 died in India daily in 2015.
Objectives- 1.study of manifestation & outcome of different types of poisoning 2.The importance of toxidrome in early recognition of poisoning & its effect on outcome.
Methods: This is a observational study, conducted in tertiary care teaching institutes of Western India. 200 poisoning patients were studied with their profile & outcome.
Results: Incidence of poisoning was more common in the age group of 20-30yrs (41%) with predominant male gender (60%). Organophosphorus compound was most commonly used for poisoning with 31% death rate whereas Aluminium phosphide & Paraquat was associated with grave outcome.
Conclusion- Poisoning incidence was more in young males. Stressful socioeconomic life style was the dominant contributing factor. Our study suggests early hospitalization with treatment of antidotes in rural area will reduce the morbidity and mortality.

KEYWORDS

INTRODUCTION

Poison can be defined as -"A substance (solid, liquid or gas) which if introduced in a living body or brought in contact with any part thereof will produced ill health or death by its constitutional or local effects or both".[1]   Indian surgeon **"Sushruta"** defined stages of slow poisoning and the remedies for slow poisoning. He also had mentioned antidotes and the use of traditional substances to counter the effects of poisoning. [2] Today, poison is used for wider variety of purposes than it used to be. However, the use of pesticides has increased staggeringly from 1950, and presently approximately 2.5 million tons of industrial pesticides are used each year. Poisons can also be used to preserve foods and building material. Poisoning both accidental and intentional is a significant contributor to mortality and morbidity throughout the world. **World Health Organization(WHO)** estimates that about 3 million cases of poisoning occur every year in the world and about 2,20,000 (2.2 Lac) deaths occur due to poisoning. Of these 90% of fatal poisoning occurs in developing countries particularly among agriculture workers. [3] .Poisoning is **the 4th common cause** of mortality in India. About 50,000 deaths occur every year in India due to poisoning alone. According to **National Crime Records Bureau Ministry of Home Affairs** Government of India, In 2015 about 37,232 people died of poisoning. It is estimated that, every year in India five to six persons per lakh of population died due to acute poisoning. Everyday almost 700 people die due to poisonings around the world. Out of which 102 died in India daily in 2015. Today the rate at which these suicides occur has risen to six in every one hour in India. However it is the deliberate self-poisoning that causes the great majority of morbidity and mortality which put pressure on already overburdened hospital services particularly in Asia & India. In developed countries, the rate of mortality from poisoning is 1% to 2% but in India it varies between 15 to 30%. [4, 5, 6] The commonest cause of poisoning in developing countries is pesticides, the reasons being agriculture based economics, poverty, unsafe practices, illiteracy, ignorance and lack of protective clothing and easy availability of highly toxic pesticides. Among pesticides Organophosphates form the largest bulk of poisoning in India. [7] The exact incidence of poisoning in India is uncertain due to lack of data at central level as most cases are not reported, and as mortality data are a poor indicator of incidence of poisoning.[8] This study was undertaken to assess the scenario of poisoning and to see the clinical profile of poisoning cases in our hospital.

MATERIAL & METHODS

Study design - A prospective cross sectional study was conducted over a period of 18 months in a tertiary care teaching hospital. This study was started after the permission from the ethical committee. Total 200 patients admitted to the tertiary care hospital over the study period with history of poisoning.

Statistical test - All the data was collected and was analysed. All the qualitative data are represented as frequencies and quantitative data are represented through mean and standard deviation. The qualitative variables were analysed by chi square test through cross tabulation. **The data were compiled using Microsoft XL version 2017 and analysed by SPSS version 23.**

Method of selection - patients qualifying the inclusion criteria was selected by random selection process.

Selection of cases:
INCLUSION CRITERIA: Patients admitted at tertiary hospital with history of poisoning including organophosphorus, organochlorine, carbamate, amitraz, and other different types of poisons.

EXCLUSION CRITERIA: Patients admitted to tertiary care hospital with history of animal bites and stings (e.g. snake bite, scorpion bite). In hospital admitted patients having hypertension, cardiac disorder, diabetes mellitus and those who are terminally ill with any other co morbidity accounting for the death of an individual.

Sample size– 200 patients with history of poisoning.

Method - The patients with poisoning and their keen/family members were informed about the nature of study and written informed consent was taken. Patients were thoroughly evaluated in terms of detailed history from patients and in case when it was not possible from the relatives, friends or the person who is accompanying the patient. Patients were inquired in terms of type of poison consumed, time of consumption, symptoms in patient, time to reach hospital, socioeconomic status, residence, occupation, intension route, cause for consumption, etc. In possible cases every attempt was made to recover the container or packet of the compound consumed by the patients. Detailed clinical examination was carried out in each case to

find out the symptoms of a suspected particular toxidrome. Effect of treatment and patient's response was noted in each case. Complications appeared during hospital stay was observed. In possible cases follow up after 4 week was obtained. The patients underwent investigation as per necessity.

RESULT & DISCUSSION
Poisoning is one of the leading cause for preventable deaths in India. Most common age group affected due to poisoning is the young population because of the exposure to stress in life. In present study maximum numbers of cases of poisoning were observed in age group 20–29 years (41%) followed by 30-39years (26.5%) {Table no.1}.which was similar to observation noted in other studies [9, 10, 11].where the same age group 21-30 years was affected with incidence of 35.1%. Present study revealed that male outnumbered females with 59% contribution to study population. Findings of the present study are consistent with other author's study [9, 10, 12, 13]. This may be because males are more exposed to stress and strains of day to day life as they have to run the family and bear many pressures i.e. economic problems, difficult life conditions and various psychological stresses. Males are exposed to occupational hazards and they have easy accessibility to the agrochemical. It was observed in the present study that male constituted 68.4% & female 31.6% of total mortality due to poisoning. The findings are similar to studies conducted by other et al [11] where contribution from male gender to total mortality was 64.3%. In present study Married patients constituted 72.5% of total study population where as 27.5% were unmarried. Deaths were more among married strata- {Table no.2}. In present study incidence of poisoning was predominantly seen in rural area contributing to almost 64.5% of total study population whereas incidence in urban area was around 35.5%. These finding are similar to the observation done by **other et al. [14]** where cases from rural area contributed to 70% of the total study population. More number of deaths in rural area could be due to the more use of pesticide in that area leading to easy access for highly toxic agent and increased time interval to reach the major hospitals where all facilities are present. In present study it was observed that maximum individuals consumed poison in the house reflecting the common cause for poisoning events as a social & domestic {Table no.3}. Around 60% individuals consumed poison at house. Findings are similar to the study carried out by **other researchers [15,16]** in which it was observed that frequency of taking the poison at home was around 55.94% highest among other places of consumption. In present study most common compound used for poisoning was organophosphorus compound (29%) followed by the house hold compounds for poisoning purpose {Table no.4}. Amitraz was used by 11.5%, phenyl 12%, rodenticide by 12%. Other compounds used were organochlorine, paraquat, carbamates & pyerethroid. **Other et al. [17,18,19]** also found that the most commonly used type of compound for poisoning was the organophosphorus compound in almost 36% of patients of poisoning**.** In term of mortality more lethal compound observed was paraquat (75%), organochlorine (42.8%),carbamates (33%) and organophosphorus, (31%). The poisoning case presented with tachycardia, bradycardia hypothermia hyperthermia pallor & icterus were having **significant** co-**relationship** between these vital symptoms & outcome of poisoning{Table no.5}. In present study 69 patients presented with single breath count of less than 12 out of which 38 died. There was increased chance of mortality with single breath count being less than 12. The patients presenting with miosis, ptosis, sweating, fasciculation, convulsion, extensor plantar response, absent planter response, absent deep tendon response, and neck lag on presentation were having significantly higher risk of death as compared to other patients in study population who were not having these symptoms. Ataxia, vertigo, tremors, myoclonus, chorea & vertigo were not associated with change in outcome {Table no.6}. Features like crackles, rhonchi, bradypnoea and tachypnea were associated with increased mortality in present study. Among the different gastro intestinal symptoms, the patients having abdominal pain, defecation, urination were having Significantly higher chances of death In present study 6pm-12am was the peak time when patients reported to the hospital. 68.5%of total patents were reported in this time spell of the day. Other studies **[20]** also observed the similar trend with maximum patients reporting to hospital in the duration of 6pm-12am with up to 50% of total admission. Maximum exposure during 6 pm –12 am might be because of people tending to over think about their problems more in the evening. As the duration to start the treatment increased there was increased mortality among the patients &it was increased up to 48.3%

of total admission reaching to hospital after 12 hours. 15 patients out of 31 died reaching hospital after 12hours.Similar trend was observed in other studies **[19]** with 52 % of mortality in patients reporting to hospital after 12 hours. In present study those who received treatment outside earlier was having mortality on lower side contributing only 34.20% of total deaths. Where as those who had not received treatment outside mortality was on higher side. In present study most of the patients received primary treatment outside for decontamination in the form of gastric pavage, activated charcoal and other symptomatic treatment. In present study it was observed that 35.5% of the study population required respiratory support in the form of mechanical ventilation where as 64.5% of patients were stable.it was observed that there exists a statically significant correlation between the need for mechanical ventilation and outcome as the chances of mortality increased with requirement of mechanical ventilation support. Other author **[21]** also observed the similar findings in their study. There found a statistically significant correlation ship between the uses of toxidrome to diagnose a particular compound poisoning and its related outcome {Table no.8}. Based on toxidrome 84.5% of patients diagnosed early in present study. Outcome was significantly affected with early treatment and there found decreased chances of mortality.

CONCLUSION
Present study concludes that adult population, male gender, individuals from rural area are more likely affected. Lower socioeconomic class and marital status also affects the frequency of events. Outcome of poisoning was equally affected by the type of poison consumed with organophosphorus poisoning being the most common with maximum mortality. House hold poisonings were more likely to recover fully. Patients received treatment earliest was having decreased chances of mortality. Clinical features at the time of presentation are more likely to affect the outcome. Early diagnosis with the help of toxidrome was associated with increased chances of survival. Increased intentional poisoning in teens and adults emphasize on importance of counselling and awareness about depression and stress- affecting the major strata of the society which increases suicidal tendencies. Finally Poisoning is a preventable non-random event and developing effective poisoning prevention strategies can effectively reduce its impact on the health of the general population

Table no 1.Correlation between different age groups and outcome in study population.

Age groups	DAMA	Death	Discharge	M	F	TOTAL
12 - 19	1	2	17	13	7	20
20 - 29	5	6	71	48	34	82
30 - 39	1	14	38	31	22	53
40 - 49	3	9	17	19	10	29
50 - 59	0	7	5	6	6	12
60 - 69	0	0	3	0	3	3
>70	0	0	1	1	0	1
TOTAL	10	38	152	118	82	200

Table no 2.Correlation between marital status & outcome in study population.

Status		Outcome			Total
		DAMA	Death	Discharge	
	Married	5	35	105	145
	Unmarried	5	3	47	55
Total		10	38	152	200
Chi-square- 10.757		df=2		P value- 0.005	

Table no 3.Correlation between the place of consumption & outcome

Place	DAMA	Death	Discharge	TOTAL
Farm	0	19	29	48
Hotel	0	1	2	3
House	9	11	100	120
Remote place	1	5	12	18
Workplace	0	2	9	11
TOTAL	10	38	152	200

Table no 4.Type of poison used & its effect outcome in study population.

TYPE OF POISON	DAMA	Death	Discharge	TOTAL
Alcohol	0	2	4	6
Amitraz	1	0	22	23

Carbamate	0	3	6	9
Drug	1	2	11	14
Khatnil	3	0	15	18
OC	0	3	7	10
OP	0	18	40	58
Paraquat	0	3	1	4
Phenyl	3	0	21	24
Pyerethroid	1	1	8	10
Rodenticide	1	6	17	24
TOTAL	10	38	152	200
Chi-square	df	**P value**		
43.1055	20	**0.002**		

Table no 5.Correlation between vital symptoms & outcome in study population.

Symptoms	Outcome			Total	P value
	DAMA	Death	Disch		
Tachycardia	1	12	25	38	<0.001
Bradycardia	0	25	38	63	
Hypotension	0	35	39	74	<0.001
Hypertension	0	0	8	8	
Hyperthermia	0	2	14	16	<0.023
Hypothermia	0	18	24	42	
Pallor	0	23	8	31	<0.001
Icterus	0	3	2	5	0.069
Cyanosis	0	25	4	29	<0.001

Table no 6.Correlation between various CNS clinical features & outcome in study population.

Symptoms	OUTCOME			Total	P value
	DAMA	Death	Disch		
Miosis	1	22	52	75	0.004
Mydriasis	0	3	11	14	0.268
Ptosis	0	37	35	72	<0.001
Tremors	0	13	35	48	0.067
Sweating	0	25	37	62	<0.001
Fasciculation	0	22	14	36	<0.001
Convulsion	0	10	9	19	<0.001
Planter abnormal	0	16	7	23	<0.001
Myoclonus	0	5	2	7	0.006
Chorea	0	1	2	3	0.772
DTR Absent	0	17	10	27	<0.001
DTR increased	0	6	10	16	<0.001
Ataxia	0	4	7	11	0.303
Vertigo	3	11	28	42	0.311
Neck lag	0	38	34	72	<0.001

Table no 8.Correlation among Patients diagnosed with the help of toxidrome & its effect on outcome in study population

Diagnosis with help of Toxidrome	DAMA	Death	Disch	TOTAL	P -value
Yes	6	25	128	169	
No	4	13	24	31	<0.005
TOTAL	10	38	152	200	

REFERENCES

1] Reddy: The essentials of forensic medicine and Toxicology: 28th, 2013.page 277
2] Harper Collins.Poison is defined as a "substance that causes death or injury when swallowed or absorbed." Colins Dictionaries, from the Bank of English Dictionary.2001; 594.
3] WHO : environmental health criteria 2010
4] Van der Hock W, Konradsen F, Athukorala,et al. Pesticides poisoning: a major health problem in Srilanka. Soc. Science Med. 1998; 46: 495-504.
5] Eddleston M, Snediff MHR, Hawton K. Deliberate Selflharm in Srilanka: An overlooked trajedy in the developing world. Br. Med. J. 1998; 317:133-135.
6] Pillay V. MKR Krishna's Hand book of Forensic Medicine and Toxicology. 12th Ed. Paras Publication. Hyderabad. 2001: 276-299.
7] M Eddleston. Severe Propanil [N-(3,4-Dichlorophenyl) Propanamide] Pesticide Self-Poisoning.Journal of toxicology: Clincal Toxicology.Q J Med. 2000; 93: 715-731.
8] Senewiratne B, Thambipillai S. Pattern of poisoning in a developing agricultural country. Br J Prev Soc Med. 1974; 28: 32-36.
9] Sandesh Datir, Madusudan Petkar, Jamebaseer Farooqui, et al. Profile of Acute Poisoning Cases at Pravara Rural Hospital, Loni. Original Research Paper. J Indian Acad Forensic Med. October-December 2015, Vol. 37, No. 4 ISSN 0971-0973.
10] Sheetu M. K. Jailkhani, Naik J. D, Thakur M. S et al. Retrospective Analysis of Poisoning Cases Admitted in a Tertiary Care Hospital.International Journal of Recent Trends in Science And Technology. ISSN 2277-2812 E-ISSN 2249-8109, Volume 10, Issue 2, 2014 pp 365-368.
11] Pate RS, Rojekar MV, Chandrakant Hire R. Trends of Poisoning Cases in Tertiary Care Teaching Hospitals in Western Indian Population. International Journal of Medical Toxicology & Forensic Medicine. 2017; 7(3):177-184.

https://doi.org/10.18869/nirp.ijmtfm.7.3.177
12] Edwin J George, Jayaraj K, John J Manjaly, et al. poisoning cases in a tertiary care hospital in central Kerala. International Journal of Recent Trends in Science And Technology, ISSN 2277-2812 E-ISSN 2249- 8109, Volume 14, Issue 2, 2015 pp 338-343 http://www.statperson.com.
13] Sunil C Aramani1, Vijay Kumar A G2, Shakuntala S AramanResearch Article Data Analysis of 595 Cases Poisoning Cases in Karad- A 3 Years Retrospective Study Scholars Journal of Applied Medical Sciences (SJAMS) ISSN 2320-6691 (Online) Sch. J. App. Med. Sci., 2014; 2(5E):1828-1830.
14] Dayanand Raddi, Anikethana G V.Clinical profile of organophosphorus poisoning in a tertiary care Hospital Indian Journal of Basic and Applied Medical Research; December 2014: Vol.-4, Issue- 1, P. 14-22.
15] Navinkumar M. Varma, S.D.Kalele Study of Profile of Deaths due to Poisoning in Bhavnagar Region J Indian Acad Forensic Med. October- December 2011, Vol. 33, No. 4 ISSN 0971-0973 313 J OriginalResearch Paper
16] Bibhuti Bhusana Panda, Manoj Kumar Hansda, Kunal Mishra, et al.Study of Poisoning Cases in an Indian Tertiary Care Teaching Hospital Indian Acad Forensic Med. April-June 2015, Vol. 37, No. 2 ISSN 0971- 0973 165
17] Sunil C Aramani, Vijay Kumar A G, Shakuntala S Aramani et al.Data Analysis of 595 Cases Poisoning Cases in Karad- A 3 Years RetrospectiveStudyScholars Journal of Applied Medical Sciences (SJAMS) ISSN 2320-6691 (Online)Sch. J. App. Med. Sci., 2014; 2(5E):1828-1830 ISSN 2347-954X (Print)
18] Anita Paritekar, Anushka Waikar.Retrospective Study of Common Poisoning at Tertiary Care Centre International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2014): 5.611 Volume 4 Issue 10, October 2015.
19] Ashtaputre MD, Shah (Malviya) AP, Malviya PB. Clinical Profile and outcome of poisoning cases admitted to ICU in a tertiary care hospital. Scholars Journal of Applied Medical Sciences. 202017; 5(2): 536-540.
20] Raut Asawari, Pawar Atmaram, Kakane Bhagwan, Toxicological Pattern of Poisoning in Urban Hospitals of Western India.Journal of Young Pharmacists, Vol 9, Issue 3, Jul-Sep, 2017 315
21] Edwin J George, Jayaraj K, John J Manjaly, et al.poisoning cases in a tertiary care hospital in central Kerala International Journal of Recent Trends in Science 2015; 14(2): 338-343 http://www.statperson.com