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Factors Affecting Clinical Management & Outcome among Patients Admitted in Tertiary Care Hospital Due To Acute Poisoning

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Abstract **Original Research Article**

Background: Occupational exposure to industrial chemicals and pesticides, accidental or intentional exposure to household and pharmaceutical products and poisoning due to venomous animals, toxic plants and food contamination, all contribute to morbidity and mortality. Early hospitalization, prompt & correct management of poisoning cases can improve outcome of patients. ***Aim:*** To study the factors affecting clinical management & outcome among patients admitted in hospital due to acute poisoning. ***Material & Methods:*** A hospital based descriptive cross-sectional study carried out in medicine ward for the period of two years. ***Results:*** Median age was 28.4 years. The incidence of suicidal poisoning was more common in females (55.74%) while accidental poisoning was more common in males. Maximum number of cases (45.33%) of poisoning were during summer. Out of 19 cases of snake bites, 12 patients required more than 100 ml. of ASV. Out of 30 patients of pesticide poisoning, 17 patients required more than 100 ml of atropine. About 60% cases had complications who reported after 5 to 6 hours after poisoning. Hundred percent mortality for patients presenting with GCS score of <8. ***Conclusion:*** First aid, timely hospitalization and intervention are the keys to prevent the high morbidity & mortality among victims. One needs to focus on availability of antitoxins, antidotes, effective medicines & quick availability of transport facility.
Keywords: ASV, OPCs, Fertilizers, Snake bite, Mortality.

INTRODUCTION

Poisoning is a major health problem globally and its incidence is rising due to rapid industrialization and urbanization. As per World Health Organization, about three million acute cases with 2, 20,000 deaths occur annually [1]. According to some studies, five lacs inhabitants die every year as a result of pesticides poisoning [2, 3]. Occupational exposure to industrial chemicals and pesticides, accidental or intentional exposure to household and pharmaceutical products and poisoning due to venomous animals, toxic plants and food contamination, all contribute to morbidity and mortality.

In India, poisoning is an important cause of unnatural morbidity and mortality. Being a farmer is a major occupation in India which can be linked to common occurrence of pesticide poisoning which can be suicidal or accidental. Bites & stings are another common form of poisoning. Methyl alcohol & drugs poisoning cases are also found sporadically [4].

Early hospitalization, prompt & correct management of poisoning cases can improve outcome of patients. For this, information about clinical profile, existing intervention & their effect on outcome is very necessary. So this study was conducted to know the factors affecting clinical management & outcome among patients admitted in tertiary care hospital due to acute poisoning.

MATERIALS & METHODS

An observational, descriptive, cross-sectional epidemiological study was conducted in tertiary care hospital under Department of Medicine in Mumbai. Permission was sought from Institutional Ethical Committee (IEC) before data collection. Study period was for the two years. Total 150 cases were enrolled for study after considering inclusion & exclusion criteria. Inclusion criteria were patients with age 13 years and above presenting in emergency department and/or admitted in medical wards & MICU within 24 hrs of exposure, patients with clinical suspicion but doubtful history of ingestion or inhalation of poison, patients with suicidal as well as accidental exposures to poison & patients presenting with different bites and/or stings were included in study. Patients not willing to participate in study, patients presenting after 24 hrs of

exposure, patients of definite h/o dog bite were exclusion criteria. Universal sampling technique was used.

A detailed case history was taken either from the patients or from the attending relatives after taking valid informed consent. Information about socio-demographic profile was collected first. An attempt was made to find out the exact nature of the compound, mode of exposure (ingestion, inhalational or dermal absorption) and quantity of the compound. The psychosocial history was taken from patients or near relatives to know any underlying psychosocial stress factors. The details of snake bite, scorpion sting or unknown bite were noted. Approximate time interval between the ingestion of poisonous agents, bite and institution of treatment was noted. Symptoms were recorded chronologically. Thorough local, general & systemic clinical examination was done to find out clinical evidence of poisoning. Clinical examination especially focused on vital signs, presence of any specific odour, fasciculation, size of pupils. The patients were followed daily to detect early complication & effect of therapy. Complications were noted down.

Relevant laboratory investigations were done. Other relevant investigations like blood urea, S. creatinine, S. electrolytes, liver function tests, arterial blood gas analysis, ECG, chest X-ray and ultrasonography were done whenever necessary. Standard operational definitions and protocols were prefixed before study and followed throughout study [4, 5].

Data about medications, vital parameter was entered in Microsoft Excel and analysed with IBM SPSS software. Tables & graphs were used to summarize the data. Descriptive statistics like mean, median, frequency & proportions were used.

RESULTS

The present study was carried out from Oct 2005 to April 2007, to study the factors affecting clinical management & outcome among patients admitted in tertiary care hospital due to acute poisoning.

Sociodemographic profile of study subjects is shown in Table no.1. In the present study, the most common age of presentation was 21-30 years comprising 38.66% of the total cases; while patients of 40 years & above were the least comprising 13% of the total cases. Median age was 28.4 years. Total number of male patients was 89 (59.33%) and female patients were 61 (40.67%). The incidence of suicidal poisoning was more common in females (55.74%) while accidental poisoning was more common in males (55.06%). Incidence of poisoning was highest (58.67%) among lower socioeconomic group and was lowest (6.66%) among high socioeconomic group. Most of the cases were farmers or at least if not working in farm but staying in the village, slum dwellers or labourers. Most of the patients were from rural area (86%) while there were only 21 (12%) patients from urban population. Suicidal cases were 74 (49.33%) and accidental cases were 76 (51.67%). Maximum number of cases 68 (45.33%) of poisoning were during summer while the least numb of cases 33 (22%) were observed during winter. Amount of OPC was unknown in maximum number (53.86%) of cases while 46.1% had consumed OPC from 10 to 30 ml.

As observed in table no.2, out of 150 patients, 60 cases (40%) were given specific treatment, whereas 90 cases (60%) were managed with supportive or symptomatic treatment. Out of 19 cases of snake bites, 12 (63.10%) patients required more than 100 ml. (10 vials) of ASV, whereas only 1 (5.30%) patient required less than 50 ml (5 vials) of ASV. Out of 30 patients of pesticide poisoning, 17 patients required more than 100 ml of atropine and only 3 patients (10%) needed up to 50 ml of atropine.

As clearly seen in table no. 3, as the time of hospitalization increased, rate of complications also increased. More than 60% cases had complications who reported after 5 to 6 hours after poisoning. It was observed that 100% mortality for patients presenting with GCS score of <8, while it was least (0.69%) for those patients with GCS score >13. Bites and stings were the commonest 52(34.66%) type of poisoning in our study. Poisoning due to pesticides was observed in 26 (17.33%) of cases. Industrial poisoning was the least common (4%) type in the present study. Out of 150 cases, total 20 (13.33%) patients developed systemic &/or local complications. The respiratory complications were observed in maximum number of cases [12 cases (60%)], whereas hepatobiliary complication was the least [1 case (5%)]. None of the patients developed local complication at the site of bite/sting. In pesticide poisoning, 6 cases (23.1%) developed respiratory complication in form of aspiration pneumonitis [2 cases; 33.33%] and respiratory failure [4 cases; 66.37%]. Out of 3 cases with rat killer poisoning, one case (33.33%) developed fulminant liver failure. Out of 150 cases, 5 cases died. The overall mortality rate observed was 3.33%. Mortality rate for various bites or stings was 5.77%, which equalled the mortality rate for pesticide poisoning. For unknown poisoning it was 6.52% and no mortality was observed for household poisoning, food poisoning & pharmaceutical poisoning. Most common cause of death was respiratory failure [4 cases (80%)].

Table-1: Socio-demographic profile of study subjects (n=150)

		Frequency	%
Age (Years)	10 to 20	32	21.33
	21 to 30	58	38.67
	31 to 40	41	27.33
	>41	19	12.67
Gender	Male	89	59.33
	Female	61	40.67
Socio-economic status	Lower	88	58.67%
	Middle	52	34.67%
	Upper	10	6.66%
Geographical Status	Rural	129	8600%
	Urban	21	14
Mode of poisoning	Suicidal	74	49.33
	Accidental	76	50.67
Seasonal variation in occurrence of cases	Summer	68	45.33%
	Monsoon	49	32.67%
	Winter	33	22%

Table-2: Treatment details in study subjects

		Frequency	%
Treatment (n=150)	Specific	60	40
	Supportive	90	60
Amount of Anti Snake Venom (ASV) given in snake bites (n=19)	≤ 50	1	5.3
	60-100	6	31.6
	> 100	12	63.1
	Total	19	100
Amount of atropine given in Organophosphorus Compounds (OPCs) Poisoning (n=30)	≤ 50	3	10
	50-100	10	33.33
	>100	17	56.67
	Total	30	100

Table-3: Factors affecting outcome in study subjects

		Frequency	%	Complications	%
Time for hospitalization (n=150)	<1 HR	53	35.33	2	3.77
	1-2 HRS	42	28	2	4.76
	2-3 HRS	18	12	1	5.56
	3-4 HRS	14	9.33	1	7.14
	4-5 HRS	1	0.67	0	0
	5-6 HRS	3	2	2	66.67
	>6 HRS	19	12.67	12	63.16
		No of pts	%	No. of deaths	%
Glasgow Coma Scale (GCS) score (n=150)	13 to 15	145	96.67	1	0.69
	9 to 12	3	2.00	2	66.67
	< 8	2	1.33	2	100
Types of poisoning (n=150)	Bites/Stings	52	35	2	5.77
	Pesticide	26	17.33	2	5.77
	Unknown	23	15.33	1	6.52
	Household	17	11.33	0	0
	Food Poisoning	15	10	0	0
	Pharmaceuticals	11	7.33	0	0
	Industrial	6	4	0	0
Type of complication (n=20)	Neurological	3	15	0	0
	Respiratory	12	60	4	33.33
	Renal	4	20	1	25
	Hepatobiliary	1	5	0	0
	Local	0	0	0	0
	Total	20	100	5	25

DISCUSSION

Most of these patients came from rural places in & around the area, being referred by medical practitioners or rural cottage hospitals or primary health centres for advanced medical life support. It was observed that, median age was 28.4 years while most common age group was 21-30 years comprising about 38.66% of the total cases. Singh B *et al*. [6] and Kara *et al*. [7] noted median age of 28 years and 28.6 years respectively, which is consistent with our study finding. This may be due to stressful environment, parental expectations, occupational hazards etc. in that particular age group. In the present study, male to female ratio was of 1.46:1. Our observation of male preponderance is similar to other studies done by Singh B *et al*. [6] & Gargi *et al*. [8] however Lawson & Mitchell [9] observed female preponderance in their study of acute poisoning. Socio-economic class & occurrence of cases were inversely related which could be correlated with the studies by Singh D *et al*. [10] and Dash *et al.* [11], which showed the incidence of 56% and 58% respectively. This may be due to occupation related hazards in lower economic class. Out of 52 cases of various bites/stings, 96.15% patients were from rural area. In 26 cases of pesticide poisoning 80.77% cases were from rural area. These findings matched with Lahori *et al*. [12] with incidence of 81.5% in rural population. Reddy *et al*. [4] Confirmed in his epidemiological study that snake bite is mainly a rural & occupational hazard. Patients of acute poisoning had made an impulsive gesture or determined suicidal attempt. Stress & depression are common factors behind suicidal poisoning. Lawson & Mitchell [9] showed that 30% reactive depression.

In our study, suicidal mode of poisoning was more common in females. Males are more vulnerable to accidental poisoning because of their professional exposure to poison, on account of their ongoing social status. Suicidal cases were more as compared to accidental. This is akin to studies done by Singh B *et al*. [6] & Gupta *et al.* [13]. In present study summer hosted maximum number of cases (45.33%) of poisoning while the least number of cases were observed during winter. This matched with the previous studies Dash *et al.* [11] [48%] & Kara *et al.* [7] [45.4%]. There was no significant difference in case of pesticide poisoning. In cases of bites &/or stings, maximum incidence 33 cases (63.5%) was noted during summer. Ashwin *et al*. [14] noted incidence of 70-80% during the period of summer and early monsoon. Dash *et al.* [11] noted incidence of 60%.

The antivenin was not found to be very effective against local effects of venom. Reid *et al*. [15] showed similar results in his study. On an average 110 ml ASV was received by all patients of poisonous snake bite. In our series of study 64% of vasculotoxic snake bite patients required blood transfusion. Reid *et al.* [15] showed it to be 62%. These 64% patients were also given at least 6 units of Fresh Frozen Plasma (FFP) to reverse their coagulation defect. Studies showed that transfusion of FFP is not required routinely in patients with coagulation defects [15]. In our study 66.66% patients showed improvement with combined therapy of ASV, atropine, neostigmine and respiratory support. Dash S *et al*. [11] showed similar results with above regime. In his study Punde *et al*. [16] required 40-320 ml of ASV on average for patients with poisonous snake bite. For OPCs poisoning on an average 90 ml of atropine was required. In this study it was found that PAM has no atropine sparing effect as even with use of PAM, the requirement was higher. De Silva *et al*. [17] showed similar results. In cases of scorpion stings, out of 11 patients, all patients (100%) were given anti scorpion venom, 7 patients (63.63%) were given tablets. In cases of Methaemoglobinaemia, methylene blue was given as a specific antidote. Total dose was not exceeded 7 mg/kg [18].

Singh B *et al.* [6] found that those patients with severe symptoms had a higher risk of mortality (72%). In cases of bites and stings, 4 cases (21%) of viper bite developed acute renal failure (ARF), of which 2 (50%) required haemodialysis. Two patients improved with conservative management. Reid *et al*. [15] reports that ARF usually responds to conservative management. In 3 cases of cobra bite all 3 cases (100%) required ventilatory assistance and neostigmine atropine regime to revert neuromuscular blockade. Paul *et al.* [19] reported quite similar result. Defective bleeding time was noted in 74% patients, while prolongation of clotting time was seen in 80% (12/15) of patients. Similar incidence was noted by Lahori *et al.* [12]. Mortality in study done by Ramesh *et al*. [20] (15.4%) was higher as compared to our study (3.33%).

The current study contributes substantial additional information regarding treatment modalities and outcome of poisoning in a tertiary care hospital. First aid, timely hospitalization and intervention are the keys to prevent the high morbidity & mortality among victims. One needs to focus on availability of antitoxins, antidotes, effective medicines & quick availability of transport facility.

REFERENCES

1. World Health Organization. Guidelines for poison control. Bulletin. 1999; Geneva, world Health Org. Available at http://www.who.int/ipcs/publications /training_poisons/guidelines_poison_control/en/. [Accessed on 10 January 2019].
2. Sharma BR, Harish D, Sharma V, Vij K. The epidemiology of poisoning: An Indian view point. J Forensic Med Toxicol. 2002;19:5-11.
3. Batra AK, Keoliya AN, Jadhav GU. Poisoning: an unnatural cause of morbidity and mortality in rural India. J Association Phy India. 2003;51:955-9.

4. Reddy KS. The essentials of forensic medicine and toxicology. J Punjab Academy Forensic Med Toxicol. 2005;5:53-58.
5. Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson J, Loscalzo J. eds. Harrison's Principles of Internal Medicine, 18e. New York, NY: McGraw-Hill. 2012:473-600.
6. Singh B, Unnikrishnan B. A profile of acute poisoning at Mangalore (South India). Journal of clinical forensic medicine. 2006 Apr 1;13(3):112-6.
7. Kara IH, Guloglu C. Acute poisoning cases admitted to a university hospital emergency department in Diyarbakir, Turkey. Hum Exp Toxicol. 2005 Feb;24(2):49-54.
8. Gargi J, Rai H, Chanana A, Rai G, Sharma G, Bagga IJ. Current Trends of Poisoning-A Hospital Profile. age. 2003;69:30-88.
9. Lawson AA, Mitchell I. Patients with acute poisoning seen in a general medical unit (1960-71). Br Med J. 1972 Oct 21;4(5833):153-6.
10. Singh D, Jit I, Tyagi S. Changing trends in acute poisoning in Chandigarh zone: a 25-year autopsy experience from a tertiary care hospital in northern India. The American Journal of Forensic Medicine and Pathology. 1999 Jun 1;20(2):203-10.
11. Dash SK, Raju AS, Mohanty MK, Patnaik KK, Mohanty S. Sociodemographic profile of poisoning cases. JIAFM. 2005:27:133-38
12. Lahori UC, Sharma DB, Gupta KB, Gupta AK. Snake bite poisoning in children. Indian pediatrics. 1981 Mar;18(3):193.
13. Gupta P, Kumar A, Singh SP, Prakash M, Gupta M, Kumar P. Pattern of Cases of Acute Poisoning in a Rural Tertiary Care Center in Northern India. Ntl J Community Med. 2016; 7(4):307-310.
14. Chaudhari A, Kumawat DC. A study of patients with acute poison: a single center experience. Int J Res Med Sci. 2018;6:1450-3.
15. Reid HA. Myoglobtnuria and sea-snakebite poisoning. Br Med J. 1961: 1285-90.
16. Punde DP. Management of snake-bite in rural Maharashtra: a 10-year experience. National Medical Journal of India. 2005 Mar 1;18(2):71.
17. De Silva HJ, Wijewickrema R, Senanayake N. Does pralidoxime affect outcome of management in acute organophosphorus poisoning?. The Lancet. 1992 May 9;339(8802):1136-8.
18. Chung-Ping Lo, Shao-Yuan Chen, Kwo-Whei Lee. Brain Injury after Acute Carbon Monoxide Poisoning: Early and Late Complications. American Journal of Roentgenology. 2007 189:4, W205-W211
19. Paul V, Pratibha S, Prahlad KA, Earali J, Francis S, Lewis F. High-dose anti-snake venom versus low-dose anti-snake venom in the treatment of poisonous snake bites-a critical study. Journal-association of physicians of India. 2004 Jan;52:14-7.
20. Ramesha KN, Rao KB, Kumar GS. Pattern and outcome of acute poisoning cases in a tertiary care hospital in Karnataka, India. Ind Soci Crit Care Med. 2009;13(3):152.