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Clinico-Epidemiological Profile of Poisoning In Children in a Rural Based Medical College and Hospital,

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Abstract: *Poisoning is a common medical emergency in childhood and one of the important causes of hospital admission and also of death. An institution based cross-sectional observational study was conducted in B.S. Medical College and hospital, Bankura, West Bengal, India. Among 89 cases of poisoning studied, 62 cases were between 1 to 3 years of age. Overall mortality was 6.67% and 8.89% cases required intensive care support. This study helps us to know the clinico-epidemiological profile of poisoning in children in this part of the country.*

Keywords: *poisoning, cross-sectional study, observational study, profile of poisoning, India*.

I. Introduction

Childhood poisoning is a major health problem and is responsible for serious morbidity and mortality. Exposure to toxic substances has become the most common cause of acute medical illness in many countries (1, 9, 13, 15, 17, 18, 19, 21). Around the world approximately three million cases of acute poisoning and 2,20,000 deaths have been reported annually. Occupational exposure to industrial chemicals and pesticides, accidental or intentional exposure to household and pharmaceutical product and poisoning due to venomous animal, toxic plants and food contamination all contribute to morbidity and mortality (2, 5, 6, 10, 12, 16). The pattern of poisoning varies from country to country and also in different regions of the same country (1, 9, 13, 15, 17, 18, 19, 21).

Peak incidence of accidental poisoning is in the second year of life and 85% of accidental poisoning affect children under five years of age (2, 3, 8, 20).

The reported incidence of childhood poisoning in India varies from 0.3 to 7.6 percent (4). Poisoning accounts for 0.03% mortality in infant, 0.16% in the 1-4 years of age and 0.37% in 5-14 years of age group as per the statistics projected by Government of India(5).

High incidence of poisoning in preschool children is a direct consequence of developmental stage of the chid. As the infant starts to crawl, creep and then walk around one year of age, his human instinct leads him into exploring the environment and putting the objects into his mouth. By two and a half to three years of age the childs motor development makes himself vulnerable for exposure to potentially noxious things. Incidence of accidental poisoning decreases after four years of age as the child gets more selective in choosing objects for mouthing and ingestion.

Male children outnumber female because of their greater activity and tendency of exploration of the environment. The incidence is also higher among children from lower socioeconomic groups due to poor storage facilities of household products and greater accessibility of children to those potentially harmful things (6).

Incidence is also higher in rural population due to use of pesticides in agricultural purpose and poor storage facilities of such pesticide (6). Incidence of kerosene poisoning is common in rural and slum population due to the fact that in summer months there is frequent power cut and also some households may not have electric-connection. Due to curiosity and easy accessibility children often drink kerosene taking it for water. In poor socio-economic set up it is not possible to store kerosene in child-proof pack.

Household products, rather than pharmaceuticals, are now implicated in the majority of paediatric poisonings (7, 8, 14).

Decrease in cases of paediatric poisoning related to drugs and pharmaceuticals in developed countries is due to introduction of child proof packs and bottles, measures which are yet to be implemented in many of the developing countries.

Studies describing the profile of poisoning in paediatric population are very meagre. With increasing urbanization and rapid socioeconomic development in India during the last several decades change in paediatric poisoning profile is expected and it needs to be explored.

The study was therefore contemplated in a tertiary care hospital with an intention of determining the profile of childhood poisoning.

II. Objectives of the study

As because poisoning is a common medical problem in children and in the coming years the profile of poisoning and intoxication is liable to undergo a phenomenal change and the pattern requires to be explored. Bankura Sammillani Medical College caters to a population which is a mixture of urban, semi-urban and rural origin. So this present study was conducted with the objective of:-

1. Showing the clinico-epidemiological profile of poisoning in children below 8 years of age in a rural Medical College Hospital.
2. Evaluating the outcome of those children admitted with various types of poisoning.

III. Materials and methods

This prospective cross-sectional study was conducted in the department of Paediatric Medicine; B.S. Medical College, Bankura; a rural Medical College in West Bengal; India. Study materials comprised of all the children less than 8 years of age admitted in the paediatric ward with poisoning. Study period extended from 1/7/2012 to 30/6/2013(1 year). A total of eighty nine (89) children were recruited in the study after getting written consent from parents/guardians.

Detailed history taking and clinical examination was done using a predesigned Proforma and necessary laboratory investigations were done. Laboratory investigations included analysis of gastric aspirates when needed, haematological workup, urine analysis, ABG analysis and others as warranted.

Clinical history emphasized on name and nature of poison ingested, history of sting/envennomation, socio-economic profile of the patient, rural/urban background, interval between the time of poisoning and admission in the hospital.

Ethical clearance from the Institutional Ethics Committee, B.S.Medical College was obtained for conducting the study and permission was sought to publish the clinical data obtained from the study.

Statistical analysis was done using SPSS software. Rates and proportion were calculated with 95% confidence intervals and level of significance was set at $p<0.05$.

Results and Analysis:-

Total 89 cases of poisoning were admitted, constituting 1% of all paediatrics admission.57 cases were male (64.00%; n=89) 32 were female (38.00%; n=89). 62 cases (69.66%) were between 1-3 years.

Table -1 shows incidence of poisoning based on type of agent

Type of poison	Rural No (%)	Urban No (%)	Total (%)
O P(Organophosphorus)	34(87.18)	5(12.82)	39(100)
HCR(Hydrocarbon)	15(68.18)	7(31.82)	22(100)
S B(Snake bite)	14(82.35)	3(17.65)	17(100)
Others	8(72.73)	3(27.27)	11(100)

Table 1 shows that almost all the cases of poisoning came from rural population because this study was based on mainly rural background. Out of total 89 cases 71 patients came from rural areas. Organophosphorus and hydrocarbon ingestion, as well as snake bite comprised of most of the cases. Other cases included dhatura poisoning (2 cases) , diazepam tablet ingestion (2 cases) , naphthalene ingestion (2 cases) , bee-sting (2 cases) , ethyl-alcohol ingestion (2 cases) , zinc phosphate ingestion (1 case).

In our study 39(43.8%) cases were organophosphorus poisoning , 22(24.7%) cases were due to ingestion of hydrocarbon product ,17(19.1%) cases were snake bite patients and the rest comprised of dhatura seed ingestion , ingestion of diazepam tablet, naphthalene ingestion, patient with bees sting, ethyl alcohol and zinc phosphate ingestion .

All poisoning cases in our study were accidental in nature by substances within easy reach of the children.

In the present study 6 out of 89 cases died; 5 of them were due to snake bite and 1 was due to zinc phosphate intoxication. Almost all the death were due to late arrival specially in cases of snake bite patients because rural people often take snake-bite victims to local ojha (traditional faith-healers) and due to poor communication facilities.

No of death was 6(6.67%) and that of survival was 83(93.25%) giving a p-value of <0.0001 which is statistically very significant.

Out of 17 cases of snake-bite 12 cases were due to poisonous snake. Out of 12 cases of poisonous snake bite 10 cases were due to neurotoxic snakes and rest 2 cases due to vasculotoxic snakes revealing a clear preponderance of neurotoxic snake bite cases. 5 snake bite cases needed ventilatory support because the patients came late.

Among 22 cases of hydrocarbon ingestion (kerosene /turpentine) in our study only 10 patient developed sign-symptoms and rest 12 case were almost asymptomatic probably due to ingestion of less amount. Symptomatic patients developed vomiting, chest- crepitation, and wheeze, fever, pneumonitis (10 out of 10); 9 out of 10 symptomatic patients developed pain abdomen and 1 patient developed severe respiratory distress and cyanosis.

In our study out of 89 cases 48 patients (53.9%) required gastric lavage.

In this study 25(28.08%) cases presented with significant vomiting out of which 15 patients came with organophosphorus poisoning and 10 cases with hydrocarbon ingestion. Total 19(21.34%) cases in our study had excessive crepitation in lungs out of which 9 cases was organophosphorus poisoning and 10 cases came with hydrocarbon ingestion.

Other significant and important clinical sign-symptoms in our study were constricted pupils (miosis) in 24(26.96%) cases; drowsiness in 17(19.10%) cases ; tachypnea in 17(19.10%) cases ; fever in 12(1340%) cases ; ptosis in 10(11.20%) cases ; wheeze in chest in 10(11.20%)cases ;pain abdomen in 9(1011%) cases.

Among other specific and certain non-specific sign-symptoms in this study were frothing from mouth in 8(8.98%) cases mainly in organophosphorus poisoning and snake-bite victims; bleeding in 8(8.98%) cases and all of them in cases of snake-bite; respiratory distress in 6(6.74%) cases mostly in hydrocarbon ingestion and snake bite and oedema in 6(6.74%) cases mostly in snake bite and bee-sting patients.

Some other clinical and laboratory findings in this study include bradycardia mostly in organophosphorus poisoning; pneumonitis in chest x-ray in10 (11.20%) cases, all in cases of hydrocarbon poisoning.

Table 2: shows distribution of patient according to type of poison and season N=89.

Type of poison	Summer No (%)	Monsoon No (%)	Autumn No (%)	Winter No (%)	Total No (%)
OP(Organophosphorus)	13(33.3)	19(48.7)	5(12.8)	2(5.2)	39(100)
HCR(Hydrocarbon)	14(63.6)	6(27.3)	2(9.1)	0(0)	22(100)
S B(Snake-Bite)	9(52.9)	24(47.1)	0(0)	0(0)	17(100)
Others	5(45.5)	2(18.2)	3(27.3)	1(9.0)	11(100)

Table 2 shows that hydrocarbon ingestion cases were most common in summer months. Snake bite cases were most common during summer and the rainy season, because snakes are cold blooded animals and go into hibernation during winter. Organophosphorus ingestion came mostly during rainy season because these agents are used as pesticides for agricultural purpose. Poisoning due to others agent like dhatura, diazepam, naphthalene, bee-sting, ethyl-alcohol, zinc-phosphate, did not show any particular seasonal predilection.

IV. Discussion

Though accurate data regarding accidental childhood-poisoning in India is rather meagre, most of the studies in this area have shown the incidence from 1 to 10% of total paediatrics admission. Incidence of childhood poisoning in our study was around 1.02% and was in conformity with most other series. In the present study 69.66% of children were in the age group of 1 – 3 years with male preponderance. This finding is also consistent with previous studies (2).

Studies from different parts of the world have described regional trends. Common poisons inflicted as reported from Indian studies are household product viz. Kerosene oil, agricultural pesticides and drugs (2). Commonest poisoning in this series was due to pesticides which conform to the findings of other previous studies (9).

Our study has clearly showed that there is a seasonal variation in the incidence of accidental kerosene oil ingestion (6, 11). This finding however is in contrast with finding in some other series. This difference in finding can be explained by the fact that our study was done in a largely rural setting where there is frequent power cuts during summer months making kerosene oil freely available in homes and mostly within the reach of the children.

In our study most common poisonings were organophosphorus; kerosene oil; and snake-bite in descending order of frequency. Uncommon poisonings in this study were dhatura, diazepam tablets, ethyl-alcohol, bee-sting and zinc-phosphate. No case of scorpion-sting was seen in this series, may be because of small size of our sample. One very uncommon site of snake-bite was seen our study: that was on the hard-palate.

There is a pertinent necessity to educate the parents and other family members regarding storage of poisonous substances in such safe places which are feasible even in poor houses and which will be beyond the reach of the children. Especially kerosene oil should not be stored in empty soft –drink or empty water-bottle which increases the chance of ingestion by children. Parents should be taught when and how to induce vomiting. In this regard there is definitely a role of health-workers working in rural health centres and sub-centres.

There is a pressing need to educate the rural people to take the snake-bite victims as quickly as possible to nearest health care facility, instead of wasting time with local, traditional faith-healers (ojha).
Overall mortality in this series was 6.7%, which is conforming to most Indian studies which report mortality in the range of 0.64% to 11.6 %(10). Out of total 6 deaths in our study five were due to snake- bite and one death was due to zinc-phosphate poisoning.

Limitation of this study is definitely less number of cases and different community spectrum. However, it surely gives useful information regarding the clinico-epidemiological profile about the childhood poisoning in this part of country; and also emphasizes the need to perform further research studies on this important subject.

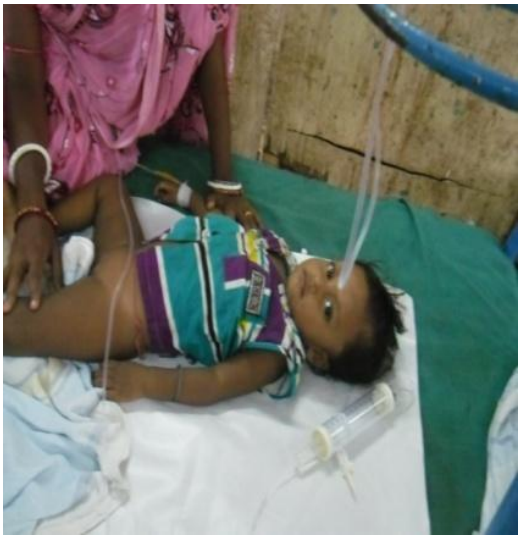
V. Conclusion

There is serious need to have ample data regarding clinico-epidemiological profile of childhood poisoning; as because the existing data is really scanty. This study will definitely indicate the pattern of poisoning in this part of country. The fact is that most of pediatric poisoning cases are preventable calamities. At least death due to poisoning in children can largely be avoided if sufficient awareness can be created among parents and guardians.

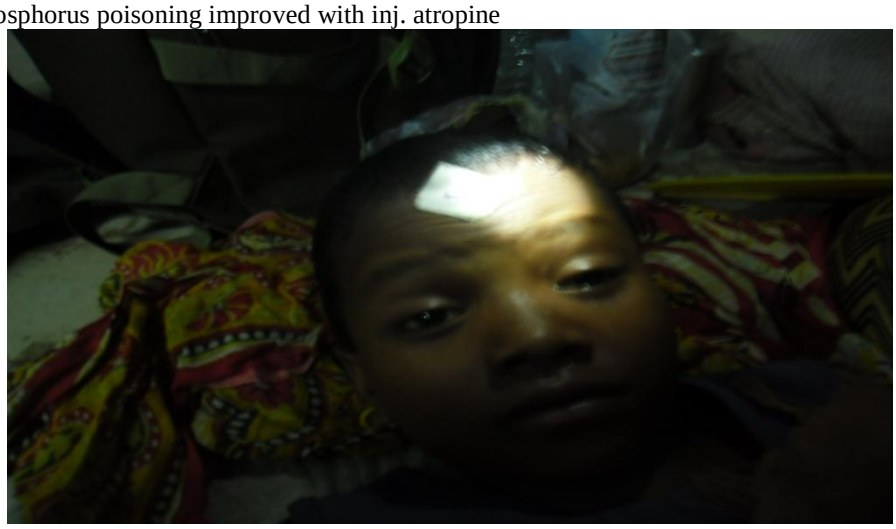
Contributions:-
Dr. Mandal actually planned and conducted the study. He collected and compiled the datas.
Dr. Pal added important intellectual contents. He also drafted the final manuscript.
Dr. Datta supervised the study and also provided some intellectual contents.
Dr. Das also provided necessary help, guidance and supervision during the entire study period. He performed the statistical analysis.
Funding – None
Competing interest - None

Pictures:-

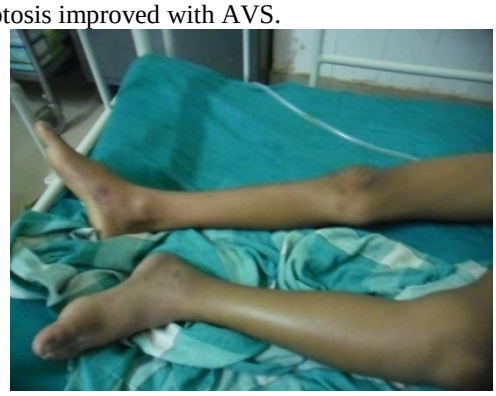
1. Insecticide ingested by children.



2. Organ phosphorus poisoning improved with inj. atropine



3. Neurotoxic snake bite with ptosis improved with AVS.



4. Heamatotoxic snake bite in right leg

5. Snake bite on hard palate

Reference

[1]. Lam LT, childhood and adolescent poisoning in NSW Australia: an analysis of age, sex, geographic, and poison types, injury prevention 2003; 9: 338-342.
[2]. Basu M, Kundu T K, Dasgupta M K, Das D K, Saha I, Poisoning, Sting and Bites in children-what is new ? An experience from a tertiary care hospital in Kolkata Indian Journal of Public Health Vol. 53 No4 October-December.2009.
[3]. Sitaram S, Sharma U, Saxena S. Accidental poisoning in children. *Indian Pediatr* 1985; 22: 757-760.

[4]. Singh S, Singhi S, Sood NK, Kumar L, Walia BNS. Changing pattern of childhood poisoning (1970-1989): experience of a large north Indian hospital. *Indian Pediatr* 1995; 32: 331-6.
[5]. Khadgawat R, Garg P, Bansal P, Arya A, Choudhary B. Accidental poisoning. Indian pediatrics. Volume-31 December 1999:1555-1557.
[6]. Rathore S, Verma AK, Pandey A, Kumar S (2013) Pediatric poisoning trend in Lucknow District, India. J Forensic Res 4: 179.
[7]. Bhat NK, Dhar M, Ahmed S, Chandar V. Profile of poisoning In children and adolescent at north Indian territory care center. JIACM 2011; 13(1):37-42.
[8]. Ghosh V B, Jhamb U, Singhal R, Krishnan R Common childhood poisoning and their outcome in a tertiary care center in Delhi. Indian J Pediatric (June 2013):516-518.
[9]. Budhathoki S, Poudel P, Bhatta NK, Dutta AK, Shah GS, Bhurtyel KK, Agrawal B, Sribastava MK and Singh MK. Clinical profile and outcome of poisoning and intoxication in children: A hospital based study. Nepal Med Coll J 2009; 11 (3):170-175.
[10]. Gupta S, Govil YC, Mishra P K, Nath R, Sribastava KL. Trend in poisoning in children: experience at a large referral teaching hospital. Natl Med J India.1998;166-8.
[11]. Khadgawat R, Garg P, Bansal P, Arya A, Choudhary B. Accidental poisoning. Indian pediatrics. Volume-31 December 1999:1555-1557.
[12]. Chowdhury AN. Banerjee S. Brahma A. Biswas MK. A study in mortality and morbidity pattern of acute childhood poisoning cases admitted in Block Primary Health Centres of Sundarban, West Bengal. Indian J Public Health. 2008;52:40-2.
[13]. Basu K. Mondal RK, Banerjee DP. Epidemiological aspects of acute childhood poisoning among patients attending a hospital at Kolkata. Indian J Public Health. 2005; 49:25-6.
[14]. Kohli U, Kuttiat VS,, Lodha R, Kabra SK. Profile of childhood poisoning at tertiary care centre in North India. Indian J Pediatr. 2008; 75:791-4.
[15]. Shoter AM. Kerosene poisoning in childhood: a 6-y prospective study at the Princess Rahmat Teaching Hospital. Neuro Endocrinal Lett. 2005; 26:835-8.
[16]. Tarvadi VK, Bakkannabar SM, Manjunath M, Palimar V, Kumar GP, Shetty M. Trend of poisoning among children at Kasturba Hospital, Manipal. NUJHS Vol-3, no 2, June 2013, ISSN 2249-7110.
[17]. Rashid Mamunur AKM, Sultana R, Nazmul Ahasan HAM, Rasul CH, Seasonal variation of acute childhood poisoning, pak J Med Sci May-June 2007Vol.23 No.3 443-445.
[18]. Korb FA, Young MH. The epidemiology of accidental poisoning in children. S Afr Med J. 1985 Aug 17; 68 (4):225-8.
[19]. Reith DM, Pitt WR, Hockey R. Childhood poisoning in Queensland: An analysis of presentation and admission rates. *J Paediatr Child Health* 2001; 37: 446 – 50.
[20]. Sarker AK, Ghosh S, Barik K. A study of accidental poisoning (in children) in a rural Medical College Hospital of West Bengal. Indian J Public Health. 1990; 34(3):159-62.
[21]. Lewis HH, Chronje RE, Naude SPE, Vandenberg C. Accidental poisoning in childhood. S Afr Med J.1989; 76: 429-431.