A STUDY OF ACUTE POISONING CASES IN A TERTIARY CARE HOSPITAL.

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Abstract: The pattern of poisoning and the substances used commonly as poisons varies from region to region. Knowledge about the trends in poisoning in a particular region will help in identifying the preventive strategies and reduce the associated morbidity and mortality. This study was conducted to describe the frequency, distribution, substances involved in poisoning exposures and their subsequent outcomes in a south Indian tertiary care centre. A retrospective study was conducted for three months, from August 2013 to November 2013 in the Intensive medical care unit and paediatric intensive care unit of the tertiary care centre. Details of the age, sex, substances used as poisons and their sources and their subsequent outcomes were collected from the hospital records and analysed. Out of the 2910 admissions in the emergency department, 460 (15) admissions were due to acute poisoning. Mean age of the total poisoning exposures was 26.5 years. Majority of poisoning exposures (23.04) occurred in the 20-24 yrs age group. Children less than 10 years contributed to 7.17 of the total poisoning exposures. Males (232 cases 50.4) outnumbered the females (195 cases 42.8) in consuming poison. Among the 460 poisoning exposures (410 (89) exposures were intentional and 50 exposures (11) were accidental. The commonest poisoning agent was pesticides (131 cases 28.47) followed by tablets (127 cases 27.60) and household agents (96 cases 20.86). Poisoning which had a higher mortality rate were oleander poison (25), pesticides (organophosphorous compound, rat killer paraquat) (2.80) and tablet poisoning (1.57). In children common household agents like fabric whiteners (13 cases 39) and kerosene (11 cases 33) were common. Possible preventive strategies include targeted ban on lethal pesticides and stringent regulations regarding availability and packing of these household agents.

Keyword: Acute poisoning, organophosphorous compounds, rat killer, paraquat, fabric whitener, copper sulphate, mortality rate.

Introduction: A poison is defined as any substance which when administered in living body through any route (inhalation, ingestion, surface absorption) will produce ill-health or death by its action which is due to its physical chemical or physiological properties. Poisoning implies the damaging physiological effects resulting from exposure to pharmaceuticals, illicit drugs, or chemicals.

More than 3 million poison exposures occur worldwide each year, most of them being acute poisoning. In India admissions due to acute poisoning constitutes 15% of hospital admission. Pattern of poisoning differs in various regions and depends on the availability and access to poisons. By studying the common sources and substances involved in poisoning in a particular region we can help in identifying passive prevention strategies for poisoning control like reducing the manufacture, sale of poison, decrease the amount of poison in a consumer product, prevent access to poison.

Aim of the study: This study was conducted to describe the frequency, distribution, substances involved in poisoning exposures and their subsequent outcomes in a south Indian tertiary care centre.

Material and methods: The present study was a retrospective study conducted for three months from August 2013 to November 2013 in the intensive medical care unit and paediatric intensive care unit of the Government Stanley Hospital, a tertiary care hospital located in Chennai, Tamil Nadu. After getting ethical committee clearance the data collection was started. Government Stanley Hospital is a 1280 bedded teaching hospital located in Chennai in the state of Tamil Nadu. Outpatients treated in the Government Stanley hospital average about 5000 per day. Total in-patient admissions average about 300 per day. It is the referral centre for poisoning patients from other primary and secondary care centres in and around Chennai, Tiruvallur and Kanchipuram districts. Patients of all ages and both sexes who presented to the intensive medical care unit and paediatric intensive care unit of the hospital with acute poisoning were included in the study. Patients with history of poisoning who presented directly to the hospital and patients with poisoning who were referred from other centres for further management were included. Patients with alcohol intoxication, snake bite, insect bite, food poisoning were excluded from the study. Data regarding the demographic characters like age, sex, marital status and occupation were collected from the accident registers and in patient records. Details of poisoning which included the nature of the poison, route of poisoning, source and circumstances involved in poisoning, treatment outcomes and events of mortality and cause of mortality were extracted and entered in the prestructured proforma.
The collected data was analysed and tabulated. Data was analysed using descriptive statistics and expressed as tables and charts. All quantitative variables were expressed as mean and percentages.

**Results:** During the period of three months from 23.8.2013 to 23.11.13, 2910 patients were admitted in the emergency department out of which, 460 admissions were due to acute poisoning. Acute poisoning contributed to 15% of admissions in the emergency department and 2% of total inpatient admissions. The mean age of the study population was 26.5 years. The mean age of poisoning exposures among males was 28.4 yrs which was higher than that of the mean age of poisoning exposure among females which was 24.18 yrs. On analysis of the age distribution it was found that the poisoning exposures were more common in the 20-24 yrs age group, which accounted for 23.04% of the total poisoning patients (Table 1). The age distribution curve peaked at 0-9 yrs age group (7.17%) and again at 20-24 yrs age group (23.04%) (Figure 1). Out of the total cases 67.38% belonged to 15-35 yrs age group which was the economically productive age group. On analyzing the gender distribution it was found that 232 (50.43%) patients were adult males, 195 (42.39%) were adult females and 33 (7.17%) were children under 10 yrs (Table 2)(figure 2). Acute poisoning may occur in many ways – exploratory exposure by children, environmental exposure, occupational exposure, recreational abuse, purposeful administration for self harm.5 In our study 410 (89%) poisoning exposures were intentional. Accidental exposure was seen in 50 (11%) patients (Table 3) (figure 3). Most common poisoning agents were pesticides (131 cases; 28.47%) which included rat killer poison (91 cases; 19.78% of the total poisoning cases), organophosphorous compounds and organochlorine – paraquat (16 cases; 3.47%), ant killer (15 cases; 3.26%) and mosquito repellants (9 cases; 1.95%). Next common poisoning agent in our set up was tablets (127 cases; 27.60%) which included antihistamines (25 cases; 5.43% of the total poisoning cases), anticonvulsants (25 cases; 5.21%), paracetamol (22 cases; 4.78%), sedatives (12 cases; 2.60%), antidepressants (11 cases; 2.39%), antipsychotic drugs (6 cases; 1.30%), oral hypoglycemic drugs (4 cases; 0.869%) and mixed group of drugs. Other common poisons were household agents (96 cases 20.8%) like corrosives (32 cases; 6.95%), fabric whitener (45 cases; 9.78%), soap oil (10 cases) and personal care products (9 cases) (Table 4,Figure 4). This was followed by solvents like turpentine, petrol and thinners (2.17%), copper sulphate (1.08%), oleanil (0.86%) and cow dung powder (0.43%). During the study period there were a total of 6 deaths, out of which 2 deaths were due to tablet poisoning and one death each due to organo phosphorous poisoning, organochlorine –paraquat poison, oleanil poison and rat killer poison. The mortality rate was highest in oleanil poison (25%), followed by pesticides (2.80%) and tablet poisons(1.57%). Among the children the common cause of poisoning was due to accidental consumption of fabric whitener (13 cases; 39% of total childhood poison) which consisted of sodium hypochlorite 5%, sodium hydroxide 1% and amine oxide. The second most common poisoning agent was kerosene (11 cases; 33%) followed by rat killer(1 case; 3%), tablets(4 cases;12%), thinner (3cases;9%) and naphthalene ball(1 case;3%)(Table 5). There were no deaths due to poisoning in children.

Mortality rate = (No of deaths/No of cases) * 100
Discussion:
During the study period of three months, 460 cases of acute poisoning were admitted in Government Stanley Hospital, a tertiary care centre located among the urban population of Chennai, a South Indian city. This contributed to 2% of total hospital admissions and 15% of medico legal admissions. Out of these 460 patients 232(50.43%) were adult males, 195(42.39%) were adult females and 33(7.17%) were children under 10 years. Males out numbered the females in consuming poisons in our study. The mean age of poison exposure was 28.14 yrs in males and 24 years in females. These findings are similar to studies conducted elsewhere in the world showing a male pre -ponderance in poisoning.6-8 A study of poisoning cases reported to the National poisons information centre, All India Institute of Medical sciences has shown that suicidal poisoning (57%) was commoner than accidental poisoning(47%) in adults.9 In our study also intentional poisoning was common (89%) than accidental poisoning (11%). Pesticides are defined as any substance or mixture of substances intended for preventing, destroying, repelling or mitigating pests. They include insecticides, herbicides, fungicides and rodenticides.10 As agriculture is the main occupation in India, pesticides are the common poisoning agents for intentional poisoning in India Study conducted in a south Indian tertiary care centre has shown that organophosphorous compounds accounted for 39.5% of poisoning in that region.11 In our study also the commonest poisoning agents were pesticides (131 cases; 28.47%) which included rat killer , organophosphorous compounds & paraquat , ant killer and insect repellants. Among the patients who consumed pesticides, one patient who consumed organo phosphorous poison died of respiratory and cardiac arrest and another patient who consumed paraquat and organochlorine poison died of multiorgan dysfunction syndrome and sudden cardiac death. The mortality rates of organophosphorous poisoning is 10 to 20 % in India. In our centre the mortality rate for pesticides was 2.80% and the mortality rate of organophosphorous and organochlorine poisons were 12.5%. The mortality rate in our centre is comparable to other centres 12. One patient who consumed rat killer died of acute fulminant hepatic failure , hepatic encephalopathy , coagulopathy and sudden cardiac arrest after one month of hospitalisation. In another tertiary care centre in south india the case fatality rates for rat killer poisoning was 35.29% which is higher than the 1.09% that seen in our centre.13 Substances commonly present in the rat killers responsible for the high mortality are the metal phosphides which have no specific antidote. N-acetyl cysteine has been recommended as an adjuvant therapy in management of these poisons.14 Other poison with high mortality rate include oleander poison (25%) due to which one patient died of cardiotoxicity. This was followed by intentional overdose of drugs which caused 127(27.17%) poisoning exposures. Among the drug overdose two patients died due to tablet poisoning. Cause of death was due to seizures in on patient who had an overdose of Metformin. Another patient who consumed an overdose of sodium valproate and clonazepam died of pulmonary aspiration following respiratory and cardiac depression. Case fatality rate was 1.57% which was lesser than other centres.15 Next common poisons were common household agents like corrosives , detergents and fabric whiteners which had no mortality.

In children accidental poisoning was common and the most common poisoning agent was fabric whiteners (13 cases) followed by kerosene (11 cases) followed by tablets(4 cases) and Thinner(3 cases). Studies on childhood poisoning conducted in iran has shown drugs (58.1%) to be a common
cause followed by hydrocarbons (13.1%) and opioids (9.3%).

Fabric whiteners and kerosene were stored in common containers which led to the accidental poisoning. Awareness programs for the parents and caretakers will help in reducing these poisoning episodes. Patients of chronic illnesses should be taught about proper storage and consumption of drugs like anticonvulsants, antipsychotic drugs. By posing stringent regulations regarding the availability, packaging of corrosives and fabric whiteners we can achieve a reduction in the poisoning episodes.

Conclusion:
Intentional poisoning is commonly seen among adult males and also females especially in the economically productive age group. Pesticides, especially rat killers were commonly used as poisons in adults. In children accidental poisoning with common household agents like fabric whiteners and kerosene stored improperly were common. Possible preventive strategies include targeted ban on lethal pesticides and stringent regulations regarding availability and packing of these household agents.

References:
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