ORIGINAL ARTICLE

Patterns of Poisoning and the Treatment Outcome in patients admitted to the Department of Emergency Medicine, KIMS Hospital, Bangalore, India

AFSHIN SHEINICHARMIAN, KIRAN NAGARAJU
Department of Pharmacy Practice Visveswarapura Institute of Pharmaceutical Sciences, Bengaluru, India
Correspondence to Afshin Sheincharmian Email: afshinsheini@gmail.com

ABSTRACT

Aim: To analyze the patterns of poisoning among in-patients admitted to the department of emergency medicine, Kempegowda Institute of Medical Sciences (KIMS) hospital and research Centre, Bangalore.
Methodology: A Hospital based prospective, observational study was conducted in the department of emergency medicine, KIMS hospital and Research Centre, Bangalore, after the approval from the Institutional Ethical Committee. Patients were included in to study according to the inclusion criteria. Patients were followed up from the date of admission to date of discharge or death. Patients were observed every day during the morning ward rounds along with the consultants and no interventions were done by the study investigators. Case sheets were used as a source of information to collect of data of the poisoning patients..
Result: Among 100 patients included in the study, the patient's age was between 16-74 years admitted to the department of emergency medicine, KIMS hospital and research Centre. OP compound poisoning and intentional drug overdosing showed the highest incidence found in 96 patients (96%) and only 4 patients (4%) were reported with accidental poisoning. In our study we found that, in 99 patients the treatment outcome was successful and were discharged with an average duration of hospital stay of 5.01 days and we had one mortality during the study period. Our study concludes that the maximum number of victims were between the age group of 21 to 40 years old, with male predominance of 61% and female of 39%.
Conclusion: study concludes that OP (Organophosphates) compound and intentional drug overdosing were the main agents reported with poisoning during the study period. We conclude that male aged between 21 to 40 years are at higher risk of self-poisoning. We also found that, delay in hospital admission caused most of the delay in hospital stay and morbidity during the study.
Key words: poisoning, KIMS hospital, Treatment, Patterns of Poisoning, drug overdose (DO).

INTRODUCTION

As per World Health Organization (WHO) definition, "Poisoning happens when individuals drink, eat, breathe, infuse, or contact a sufficient of a hazardous substance (poison) to cause disease or death". A few poisons can cause illness or injury in extremely little sums. Illness may happen in all respects rapidly after exposure to a poison, or it might create more than several years with long-term exposure[1]. New experiences in medication and worthy medicines require an adjustment of the current meaning of clinical or forensic poisoning to: An individual's medical or social inadmissible condition as an outcome of being under impact of an exogenous substance in a dose too high for the person concerned. For medical and lawful purposes, it is imperative to know how the victim became poisoned. When all is said in done, there are three different ways of causing medical poisoning: including iatrogenic poisoning, accidental poisoning, experimental and intentional poisoning[2].

Purposeful self-hurt is a major public health problem in many creating nations including India[3]. Each year, 500,000 deaths happen in rustic Asia because of suicide, and 200,000 of these deaths are because of self-organophosphates (OP) poisoning. The medical administration of poisoning emergencies is troublesome and, till date, there are no obvious proof based rules for the best management of OP poisoning[4]. Drug overdose (DO) is simply the second most regular method of purposeful self-harm after poisoning with pesticides. Both are related with a high case fatality rate (CFR). In creating nations, the

fatality rate is 15-times higher than in industrialized nations[5].

The newly published Global Burden of Disease Study (GBD) demonstrated that around the world, inadvertent poisoning was in charge of an expected 180,000 deaths in 2010. This converts into a mortality rate of 2.6 per 100,000 inhabitants, making poisoning a best 50 reason for death. In any case, contrasted with 1990 figures, it creates the impression that unintentional poisoning has diminished fundamentally; an 11% decrease in complete deaths and a 34% decline in the mortality rate[6].

Poisoning likewise in charge of a critical extent of intentional injuries, especially those that are self-inflicted. It is estimated that 23% of self-inflicted injuries globally include the intentional utilization of pesticides. In any case, the type of poison utilized for conscious self-poisoning changes essentially by area. In low middle income countries (LMICs), pesticides for example, organophosphate, carbamate, organochlorine, parqueted and aluminum phosphide/phosphate are the significant poisons utilized, particularly in rural zones, and are related with high mortality, whereas in urban zones, medicines are more basic specialists and by and large connected with low mortality[7].

Drug poisoning is a condition where substances that are used normally in medical practice are ingested in an inappropriate manner, usually in deliberate self-harm, recreational use or through medical error. Drug poisoning can also refer to the use of illegal street drugs but in this study term "drug poisoning" includes medical products

unless otherwise stated. Self-poisoning is a condition in which an individual takes a poisonous substance, either accidentally or with suicidal, DSH or recreational intent. Intoxication is a condition that may follow ingestion of a poison or an inappropriate use of a drug and can be described as an altered level of consciousness, mental status or physiology[8].

The underlying methodology for assessing the basically poisoned patient centers on exhaustive appraisal, suitable adjustment and steady consideration. Aggressive resuscitation is frequently required for the patient giving a toxicological emergency. This pursues a standard "ABC" approach with consideration regarding "airway, breathing and circulation" individually. The basically poisoned patient may present with central nervous system (CNS) discouragement or unconsciousness requiring in order to adequately protect the airway and decrease aspiration risk. Ventilatory drive may also be impaired bringing about CO_2 narcosis with resulting acidosis and mental status crumbling which may additionally increase risk for aspiration. Regularly this deterioration can be unrecognized in the patient placed on high stream oxygen cause of O_2 saturation measures may stay satisfactory despite significant ventilatory failure. In evaluating and overseeing circulatory status, appropriate intravenous access is essential. All severely poisoned patients ought to have no less than one large bore peripheral intravenous catheter, and hypotensive patients ought to have a second intravenous line put in either the peripheral or central circulation. Should vasopressor support be required, consideration ought to be given to the particular poison as the mechanism producing hypotension may help direct the vasopressor choice. Specialists with peripheral alpha antagonism, for example the atypical antipsychotic olanzapine, may react well to coordinate alpha incitement with phenylephrine[9].

MATERIALS AND METHODS

All the poisoning patients admitted under the department of emergency medicine, KIMS hospital and research center, irrespective of any age and sex group. Data was entered directly from the patient case sheet into a well-designed data collection form. When adapting and designing the data collection form, we have first considered how much information should be collected. Collecting too much data could prompt structures that are longer than unique investigation reports, and can be extremely inefficient of time. Accumulation of too little data or oversight of key information, could prompt the need to come back to contemplate reports later in the survey procedure. Data collection form was designed to meet objectives of this study; this form includes different sections regarding the needed data such as patient's demographic data, history and complaints, laboratory data, treatment etc. The study consists of a prospective design. No interventions were made, which meant that there were no direct health-related risks for the study population. The patients did not receive any direct or indirect benefit from being included in the study. The possible risks for the patients in this design include possible data leaks that could be harmful for the individuals. The data protection was performed using coding of the patients so that patient chart management and statistical analyses were performed without names or adhere numbers. Approval was obtained from the institutional ethical committee of Visveswarapura Institute of Pharmaceutical Sciences for protocol (Ref. No: VIPS/IEC/2016-04). The study can be considered justifiable from an ethical point of view. Firstly, acute drug poisoning is a common cause of hospital admission. The usual outcome is good but complications cause morbidity. The risk factors for morbidity and the interventions avoiding morbidity have not been well studied. Secondly, all admissions due to acute self-poisonings could be considered unnecessary and avoidable. From an ethical point of view, studies concerning avoidable conditions causing morbidity and mortality are justified as are studies concerning the prevention of these avoidable conditions.

RESULT AND DISCUSION

The results of this study confirm that short-term outcomes of the patients admitted to hospital due to poisoning are good. The rate of hospital mortality among patients was low, even those requiring intensive care. Average duration of hospital stay was found to be 5.01 days and the treatment outcome was found to be 99% discharge rate with 1% death due to poisoning. Patient characteristics The present study has analyzed data from both genders, the proportion of male patients was found to be higher than female patients, out of total 100 patients, 61% were male patients and 31% were female patients. The high incidence may be because male subjects were more exposed to stress, strain, and occupational hazards compared with female subjects. Even accessibility of poisons is at easier means for the male subjects when compared with female subjects; increased risk-taking behavior among male subjects also contributes to the same [11]. Most of the poisonings in this study have been seen in the age group between 20 to 30 years old, which was similar to the study conducted at Mysore and North India [12,13]. The average age of patients under study was 33.04 years old. The youngest patient was a 16 years old female patient and the oldest patient was a 74 years old male patient. Patient settlement status is one of the possible contributing risk factors and data collected during study period declared that 73% of poisoning patients under study were settled in city and 27% were from rural areas. Past medical history both mental and physical disorders was followed as another possible contributing risk factor and it was found out that 85% of patients under study had no significant as medical history and only 15% of patients had a history of significant health problem.

Patterns of poisoning: OP compound poisoning and drug overdose showed the highest incidence rate among the poisoning cases under study, 34% of patients under study were reported to be poisoned by OP compound followed by 28% of drug over dose patients. Out of total study population 96% of patients were found to have intentionally poisoned themselves that is intentional self-poisoning and only 4% were poisoned accidentally. Majority of the poisonings were intentional, which was similar to the findings of other studies [14]. The average time from exposure to presentation at health care facility was found to be 2.7 hours and during this duration 33% of patients have received prior treatment whether in another hospital/clinic facility or at home. All patients were reported to have ingested the poison that is poisoning by oral route and

location of poisoning was reported as home for 93% of patients and remaining 7% were reported as being poisoned outside home (6% in public places and 1% in a restaurant) and important factor in identification of causative agent of poisoning is the clues found in location of exposure, in 60% of cases open container of poisoning agent was reported as a clue and in 24% of cases empty strips of tablets were found at the location and in 16% of cases there was no clue found. Based on our study data, there is more incidence of poisoning during day time (6am-6pm) compared to night time (6pm-6am), 67% of patients under study were poisoned during day time and remaining 33% were reported to have been poisoned during night.

Most of patients directly presented to the emergency department without any prior interventions (67%). Others underwent interventions such as gastric lavage (22%) and antidote administration of atropine and pralidoxime.

Treatment outcome: The present study involved patients with serious drug/chemicals poisonings who required intensive care and had relatively short hospital stay and low hospital mortality. As mentioned earlier out of 100 patients only ONE patient died due to poisoning and remaining 99 patients were discharged and sent home. Based on data collected during this study, average duration of hospital stay of poisoning patients was 5.01 days and most of the patients were managed in ICU services. In a similar study done previously in Bangalore, the hospital stays of the admitted patients with poisoning ranged from 01 to 52 days and the mean hospital stay was 7.9 days, during the hospital stay, most of the cases were managed in ICU[10].

Organophosphorus compounds are the dominant cause of the poisoning (34%), other major agents are: drug overdose (28%) (e.g., alprazolam, cetirizine, paracetamol, etc.), rodenticide agents (10%), aluminums phosphide (6%), bed bug pesticide (5%), toilet cleaner agents (4%). Other causes include: alcohol (3%), Phenol (3%), sulphuric acid (1%), cannabinoids (1%). For 2% of all patients source of poisoning was unknown. An important finding of present study was that there is a direct relationship between time from exposure to presentation at health care facility and mortality rate and duration of hospital stay based on our findings, sooner the patient is presented at health care facility, lesser complications and thus better the treatment outcome.

Figure 2 shows the pattern of drug overdose. Sedatives and antiepileptic drugs were the most common, with 18%, 16% Respectively, followed by antidepressants and paracetamol. The present study showed DO to be 34% of the study population, of which female patients accounted for75% of the cases. Young women in the age group of 21–30 years accounted for 39.5% of the DO cases, with nearly 50% being married, and were from an urban background.

DOs were overseen frequently in the general wards symptomatically. A total of 37.5% got ICU care for a duration of 3.25±0.71 days, and none of the patients required helped ventilation. Paracetamol was the most widely recognized drug with explicit remedy utilized in instances of overdose. N acetyl cysteine (NAC) was the antidote utilized. Most instances of barbiturate overdose were overseen symptomatically. In 17.5% of the patients, the medication levels were elevated, and, in them, forced alkaline dieresis (FAD) as infusion was utilized adequately for a duration(days) of 2.60±1.51. DO patients (85%) were dealt with symptomatically, and just one of the patients required utilization of inotropes.

Table 1: Prior medical interventions done before presenting patient to emergency department of KIMS hospital.

Prior Medical Interventions Before Presenting Patient To Emergency Department	%age of patient
No previous treatment	67
Gastric lavage	22
Stomach wash,injection pam & injection atropine	6
Stomach wash ,injection pam	3
Stomach wash , injection atropine	1
Injection atropine	1

Table 2: Pattern of poisoning

Causative agent of poisoning	% of dominant agent
Rodenticide agents	10
Aluminums phosphide	6
Bed bug pesticide	5
Toilet cleaner agents	4
Alcohol	3
Phenol	3
Sulphuric acid	1
Cannabinoids	1
Unknown component	2
Drug overdose	34
Organophosphorus compounds	34

Fig. 1: Prior medical interventions done before presenting patient to emergency department of KIMS hospital.
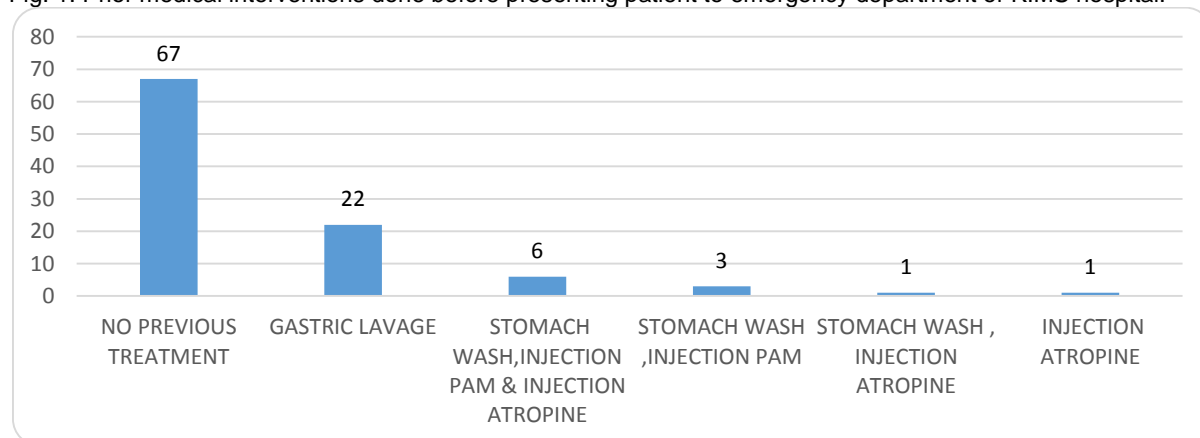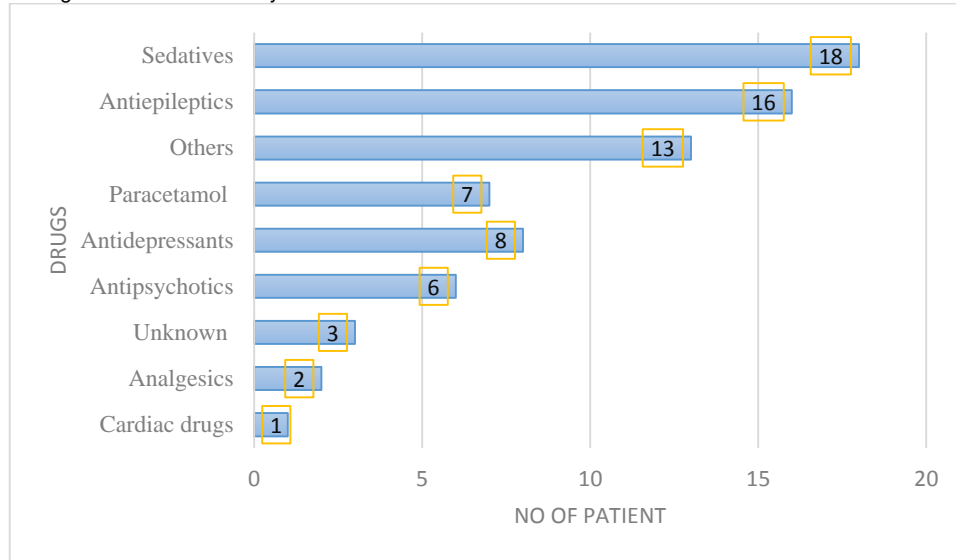
Fig. 2: The pattern of drug overdose in the study

CONCLUSION

The results showed that among 100 patients age 16-74 years old admitted to department of emergency medicine, KIMS hospital and research Centre, OP compound poisoning and drug overdose showed the highest incidence.it was found that 96% of patients had self-poisoning and only 4% with unintentional poisoning. Data also showed that 99 patients were discharged with average duration of hospital stay of 5.01 days and one patient had mortality. Our study concludes that the maximum number of victims were with average age of 33.04 years, with high male predominance (61%). The most common manner of poisoning was suicidal with oral ingestion. This study also concludes that OP compound poisoning and drug overdose are the main reasons of hospitalization of poisoned patients. We conclude that male aged between 21 to 40 years are at higher risk of self-poisoning, and our final conclusion is that there is a direct relationship between time from exposure to presentation at health care facility and mortality rate and duration of hospital stay. Organophosphorus compounds pursued by pyrethroids and organocarbamates were the most well-known poisons, while sedatives, antiepileptic pursued by antidepressants and paracetamol were the regular medications experienced in drug overdose.

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