

## PATTERNS OF POISON INFORMATION QUERIES RECEIVED BY A NEWLY ESTABLISHED SOUTH INDIAN POISON INFORMATION CENTER

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Received:12 January 2012, Revised and Accepted:11 March 2012

### ABSTRACT

The newly established Poison information centre (PIC) at Department of Clinical Pharmacy, JSS College of Pharmacy, located at JSS Medical college hospital, Mysore, Karnataka, India provides poison information services to healthcare professionals and general public. The PIC is effectively functioning since September 2010. The prospective study was conducted over a period of one year to assess the patterns of poison information queries received by PIC. A total of 348 poison information queries were received and answered during the study period. Of the total queries received, majority of queries were from doctors (75.5%) followed by health care professionals and public. Majority of the queries (82.2%) were received from healthcare facilities. A total of 34.5% queries were related to know the management of poisoning. Most of the queries were for better patient care (74.1%) and the information was provided verbally for majority of the queries (72.4%). For most of the poisoning queries (62.9%) the information was provided immediately. Significantly ( $p < 0.001$ ) majority of queries asked were related to intentional (suicidal) poisoning (66.5%) followed by accidental (23.2%) and environmental poisoning (5.8%). Majority of queries were related to poisoning from pesticides (44%) followed by medicines (26.1%), household products (15.8%) and bites and stings (10.1%). Intentional poisoning was most common in adolescents and adults ( $n=241$ ; 69.2%) whereas accidental poisoning was the common in paediatric (0-12 years) population ( $n=56$ ; 16.0%) which attained statistical significance ( $p < 0.001$ ).

**Keywords:** Poisoning, Poison information center, Poison information service, Intentional, Mysore, India

### INTRODUCTION

Poison information centre (PIC) is a specialized unit providing information on early diagnosis, treatment, prevention and hazards management of poisoning<sup>1</sup>. Poison information services (PISs) mainly deals with a timely provision of poisoning management information appropriate to the needs of the enquirer<sup>2</sup>. The primary aim of provision of PISs is to reduce the morbidity and mortality due to poisoning<sup>3</sup>. PISs helps in reducing the poisoning treatment cost to the patients and to public health care facility by preventing the unnecessary visits to the healthcare facility and prolonged hospitalization<sup>4</sup>.

Poisoning is a significant global public health problem. According to world health organization (WHO), in the year 2002, it is estimated that 350,000 people died worldwide from unintentional poisoning. In the year 2000, unintentional poisoning was the 9<sup>th</sup> most common cause of death globally in young adults (15-29 years) and approximately a million people died as a result of suicide and quarter of these deaths are due to ingestion of chemicals<sup>5</sup>. According to world health organization (WHO) data, an estimated 346,000 people died worldwide from unintentional poisoning in the year 2004. Of these deaths, 91% occurred in low- and middle-income countries<sup>6</sup>. In developing countries, pesticides are frequently used for suicidal poisoning. Snakebite is a largely unrecognized public health problem and it has been estimated that in about 2.5 million people are envenomed per year, and over 125,000 died<sup>5</sup>.

In India, there are higher incidences of poisoning and is also one of the major causes of death<sup>7</sup>. WHO reports that unintentional poisoning was the sixth most common cause of death in India, in adults of the age group of 15-29 years<sup>5</sup>. In India, poisoning cases are being treated at different levels of health care facility including government and private settings. However, owing to lack of poison information services, management of acute poisoning cases is a difficult task to physicians working in emergency departments of Indian hospitals<sup>8</sup>. This is of great concern for both public and healthcare professionals on the back drop of lack of facility and poison information services. As there is no PIC in this vicinity, the PIC was established with aim of providing rational care for poisoned patients. With this background the study was conducted to know the pattern of poison information services provided by the newly established PIC.

### MATERIAL AND METHODS

This is a prospective study conducted for a period of one year. The study was conducted in the PIC established by Department of Clinical Pharmacy, JSS College of Pharmacy, located at JSS Medical college hospital, Mysore. The PIC started functioning effectively since September 2010. JSS Hospital, Mysore is a tertiary health care centre catering to the needs of the people in and around Mysore district. The PIC has basic and necessary infrastructure facility [toll free telephone (1800 425 0207), e-mail ID (pic.jsscp@jssuni.edu.in), computer, printer, fax, internet facility, information resources such as standard text books, Poisindex and Drugdex a secondary information resources] to provide poison information services. The PIC also has website (www.picjsscp.jssuni.edu.in) with an objective of to provide insight into the established poison information centre to healthcare professionals and general public. The poison information services were initiated for healthcare professionals and general public. The trained clinical pharmacists were received poison information query and provided the poison information. With an objective to provide appropriate poison information in time the standard operating procedure (SOP) was adopted to answer the queries related to poisoning. The SOP provides the procedure to be followed to provide timely and accurate poison information. The SOP contains steps of systematic approach to poison information query.

### Assessment of patter of poison information queries received

All the queries received by health care professionals and general public regarding poisoning in human were included in the study. All the poison information queries received and information provided were documented in a suitable designed poison information documentation form. All the relevant and necessary details pertaining to poisoning query including type of population (children, adult, elderly, pregnant), poisoning agents, route of exposure, type of poisoning (intentional, accidental and environmental), poisoned patient's demographic details (age, gender, bodyweight), enquirer details (enquirer background, place of call, mode of request), details of query (category of query, purpose of query) details of poison information (information provided, mode of provision, time taken to provide information, reference consulted) were collected and documented in the poison information documentation form. For the purpose of easy storage and retrieval of information, the details were also documented in the soft copy/electronic database. The data was analysed performing percentage value and chi square test.

## RESULT AND DISCUSSION

### Patterns of poison information queries received by a new south Indian poison information centre

A total of 348 poison information queries were received and answered during the study period. Of the total queries received, majority of queries were from doctors (75.5%) followed by health care professionals and public (Table 1). Our study findings are similar to the study conducted by Ansam F S in poison control center, Palestine in which majority of the queries were from doctors followed by other healthcare professional and public<sup>9</sup>. The results show that the doctors and other healthcare professionals were more aware about poison information services and better utilised the services than the general public. This suggests that more awareness programmes are needed to be conducted among the general public to utilise the service. In 82.2% of cases, queries were received from healthcare facilities followed by work place (10.1%) and residence (7.7%) (Table 1). Most of the queries (44.3%) were asked by direct

access followed by during the ward rounds and telephonically (Table 1). A total of 34.5% queries were related to know the management of poisoning followed by toxic effects (17.2%), range of toxicity (16.7%) (Table 1). Most of the queries were for better patient care (74.1%) followed by the knowledge update (25.9 %). The information was provided verbally for majority of the queries (72.4%) followed by written and printed form (Table 1). For most of the poisoning queries (62.9%) the information was provided immediately followed by within 10-20 minutes, within 1 hour and within 2-4 hours (Table 1). Because of non availability of the details about the poisons substance the provision of information was delayed (within 2-4hours) in few queries. The information for the queries related to update knowledge were given either within 1hour or within 2-4 hours. In 56.9% of cases Poisindex was used as an information source followed by standard treatment protocols (27.0%), textbooks (21.6%) and others (9.5%). Others category included database of brand names and their ingredients and online information websites.

**Table 1: categorization of poison information queries based on background information**

BACKGROUND INFORMATION	SUB CATEGORY	QUERIES n (%)
Enquirer's status	Doctor	263 (75.5)
	Other health care professionals	62 (17.9)
	General public	23 (6.6)
Place from query asked	Healthcare facility	286 (82.2)
	Work place	35 (10.1)
	Residence	27 (7.7)
Mode of receiving queries	Direct access	154 (44.3)
	Ward rounds	99 (28.5)
	Telephone	90 (25.8)
	E-mail	5 (1.4)
Category of queries*	Management	120 (34.5)
	Antidote	40 (11.5)
	Identification	14 (4.0)
	Range of Toxicity	58 (16.7)
	Toxic effects	60 (17.2)
	Toxico-kinetics	15 (4.3)
	Toxico-dynamics	25 (7.2)
	Monitoring laboratory parameters	16 (4.6)
	To know the contents	20 (5.7)
	Purpose of query	Patient care
Update knowledge		90 (25.9)
References consulted**	Poisindex	198 (56.9)
	Text books	75 (21.6)
	Standard treatment protocols	94 (27.0)
	Others (websites, published articles)	33 (9.5)
Mode of provision#	Verbal	252 (72.4)
	Written	65 (18.6)
	Printed	46 (13.2)
	Mail	05 (1.4)
Time taken to provide information	Immediately	219 (62.9)
	Within 10 - 20 minutes	79 (22.8)
	Within 1 hour	32 (9.2)
	Within 2-4 hours	18 (5.1)

\*queries were asked regarding more than one category; \*\* more than one references have consulted for few queries; # information is provided in more than one mode

**Table 2: classification of poison information queries as per the type of poisoning**

TYPE OF POISONING	QUERIES n (%)
Intentional	
Suicidal	231 (66.5)
Abuse	07 (2.0)
Misuse	09 (2.5)
Accidental	
General	81 (23.2)
Environmental	20 (5.8)

Significantly ( $p < 0.001$ ) majority of queries asked were related to intentional (suicidal) poisoning (66.5%) followed by accidental (23.2%) and environmental poisoning (5.8%) (Table 2). Several studies also showed the similar observations<sup>7,10,11</sup>. Suicide by using

poisonous agents has increased because there is a general belief that poison ends life with minimal suffering, and also victims prefer to swallow a pill or poison rather than hanging unto death or jumping from heights.

Majority of queries were related to poisoning from pesticides (44%) followed by medicines (26.1%), household products (15.8%) and bites and stings (10.1%) and unknown agents (4.0%) (Table 3). The study findings reveal that the common poisoning agents involved were pesticides followed by medicines and household products. Among the pesticides the majority of the queries were related to organophosphate (26.6%) followed by carbamate (5.8%), pyrethroids (5.2%), aluminium phosphide (3.1%), organochlorine (2.3%) and paraquat (1.0%). Several studies conducted in South India also show similar findings about the common poisoning agents involved<sup>3,12</sup>. Also numerous studies revealed that the pesticides are the common poisoning agents used in Asia Pacific Regions which is in agreement with our study findings.<sup>10,11</sup>. Notably, the commonest type of poison encountered in this study was the compounds of organophosphorus (26.6%) which is consistent with studies conducted by Pillay VV *et al*, Roberts DM and *et al* Gunnell J *et al*<sup>12-14</sup>. As agriculture is the prime profession for majority of the people in rural areas of this region and pest control is the major problem faced by the farmers, they procure the pesticides and store it at their home. This makes easy availability of pesticides and therefore people tend to use the pesticides for intentional poisoning. Similarly due to easy availability of medicines (both prescription and non-prescription medicines) people tend to use medicines for the intentional poisoning. Improper handling, storage and disposal of pesticides were some of the reasons lead to accidental poisoning.

**Table 3: classification of poisoning queries based on poisoning agents**

POISONING AGENT	QUERIES n (%)
<b>Pesticides</b>	<b>153(44 )</b>
Organophosphate	93(26.6)
Carbamate	20 (5.8)
Pyrethroid	19(5.2)
Aluminium Phosphide	10(3.1)
Organochlorine	08(2.3)
Paraquat	03(1.0)
<b>Medicines</b>	<b>91(26.1 )</b>
Benzodiazepines	28(8.0)
Paracetamol	15(4.3)
Phenytoin	09(2.6)
NSAID	08(2.4)
Resperidone	06(1.4)
Thyroxine	05(1.5)
Metformin and Pioglitazone	04(1.2)
Multiple drugs	16(4.7)
<b>House hold Products</b>	<b>55(15.8)</b>
Kerosene	21(6.1)
cleaning agents	13(3.8)
Paint thinner	7(2.1)
Nail polish remover	8(2.4)
Camphor	6(1.4)
<b>Environmental</b>	<b>35( 10.1)</b>
Snake bite	28(8.1)
Stings	7(2.0)
<b>Unknown</b>	<b>14 ( 4.0)</b>

The details of poison information provided based on age, gender and type of poisoning are given in Table 4. Accidental poisoning was the common type in paediatric (0-12 years) population ( $n=56$ ; 16.0%) whereas intentional poisoning was most common in adolescents and adults ( $n=241$ ; 69.2%) which attained statistical significance ( $p < 0.001$ ). The findings show that the queries regarding accidental poisoning were more ( $n=42$ ; 12.06%) in children of the age group 0-5 years and common agents involved accidental poisoning were house hold products like kerosene, cleaning agents, paint thinner, nail polish remover and camphor. Several studies reported that the accidental poisoning was found more in less than 6 years of age and common agents involved were kerosene, cleaning agents and acetone<sup>9,15</sup>. Queries pertaining to accidental poisoning was seen more in male ( $n=24$ ; 6.89%) children compared to female ( $n=18$ ; 5.17 %) children in the age group of 0-5 years. This is because male children at this age group become more curious in their newly acquired hand skills and mobility due to their explorative, active and

restless behavior than female children. Negligence or unawareness of the parents and caretakers is one of the main factors in making the environment of the child favorable for accidental poisoning. Accidental poisoning in children can be prevented or minimized by educating the parents/caretakers regarding safe storage of poisonous household products, medicines and pesticides.

**Table 4: classification of poisoning queries based on age, gender and type (accidental/intentional) of poisoning**

AGE GROUP (Years)	INTENTIONAL		ACCIDENTAL		QUERIES n (%)
	Male (n)	Female (n)	Male (n)	Female (n)	
0-12	02	00	32	24	58 (16.7)
13-24	40	43	10	05	98 (28.2)
25-36	74	47	13	05	139 (39.9)
37-48	16	08	04	01	29 (8.3)
49-60	12	01	02	00	15 (4.4)
60-72	03	01	05	00	09 (2.5)

PIC plays an important role in the management of poisoning cases by providing poison information services and studies have also shown that provision of poison information services markedly contributes to the rational care of poisoned patients and thereby reducing health care costs<sup>16,17</sup>.

## CONCLUSION

The assessment of pattern of queries received by new PIC concludes that majority of queries were received from doctors and from healthcare facility. Majority of queries were related to better patient care. Most of the queries were related to intentional poisoning, and common poisoning agents involved were pesticides followed by medicines and household products. The study concludes that the poison information services are better utilised by doctors and healthcare professionals and assisted in the management of poisoning cases.

## Acknowledgements

Authors thank JSS University, Dr. HG Shivakumar, Principal, JSS college of Pharmacy, Dr. G Parthasarathi, HOD of Pharmacy Practice for their support during the study.

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