

# Preparation and implementation of standard therapeutic guidelines for poisoning cases in a tertiary care hospital, Mysuru, India

*Preparación e implementación de pautas terapéuticas estándar para casos de intoxicación en un hospital de atención terciaria, Mysuru, India*

**Yasaman Jafarniay Jahromi** , **Nisar Ahmed** , **Pouyan Haghpahan** , **Sadaf Hojjati** 

*Doctors of Pharmacy, Department of pharmacy practice, Farooqia College of Pharmacy, Mysore, India*

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## Corresponding author

Yasaman Jafarniay Jahromi  
Farooqia College of Pharmacy, Mysore, India  
E-mail: Jafarniayasaman@gmail.com

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## Abstract

**Objective:** The goal of the research is to prepare and implement the standard therapeutic guidelines for poisoning cases in a Tertiary Care Hospital, Mysuru, India. It also aims to identify common agents associated with the poisoning cases and to study the result outcomes and identify the types of poisons, route of administration, and outcomes of poisoning cases.

**Methodology:** A retro-prospective observational study was conducted in tertiary care hospital over 6 months. All necessary data were collected in a well-designed data collection form. Standard therapeutic guidelines were prepared with the reference of modern medical toxicology textbooks, patient poisoning treatment chart research articles, and other national guidelines.

**Result:** A total of 50 patients' poisoning case sheets were studied. The majority of patients with poisoning cases were found in the age group of 31-40 (32%), followed by the age group of 41-50(24%), age group of 0-15 (14%), age group of 21-30 (12%), age group of 51-60 (12%), and age group of 16-20(6%). Among them, a significant number of poisoning cases show the duration of hospital stay. The majority of patients in the study had a shorter stay in the hospital. We found 32(64%) of patients with poisoning had a shorter stay of 3-5 days in the hospital, followed by 16(32%) of patient's hospital stay was 6-8 days, 1(2%) patients for 0-2 days and 1(2%) patients for 9-11 days. The majority of patients with poisoning were married 33(66%) than unmarried 17(34%). Among patients with poisoning 9(18%) had health insurance and 41(82%) did not have health insurance. The pattern of poisoning in the study, the most common being OP 14(28%), paracetamol 6(12%), carbamate 5(10%), pyrethroid 4(8%), aluminium phosphide 4(8%), acetone 3(6%), eucalyptus 2(4%), snakebite 2(4%), benzodiazepines 1(2%), Ethanol 1(2%), HCL 1(2%), kerosene 1(2%), metformin 1(2%), metoprolol 1(2%), naphthalene 1(2%), phenytoin 1(2%), sulfuric acid 1(2%), organochlorine 1(2%). Among all the poisoning cases 50% of substances associated with poisoning were pesticides, 12% chemical poisons, 10% hydrocarbons, 10% analgesic antipyretics, 6% neurotoxic poisons, 4% organic poisons, 4% other drugs. 93.9% of poisoning were due to oral exposure, 2% eye exposure, 2% dermal exposure and inhalation exposure 2%. We also found that 84% were deliberate poisoning and 16% were accidental poisoning.

**Conclusion:** Prepared the Standard Therapeutic Guidelines for 60 substances/compounds associated with the poisoning. Standard therapeutic guidelines offer toxicological information services to health professionals and patients in identifying poisons, symptoms, antidotes, and management of poisoning cases. A total of 50 patient case sheets of poisoning cases were followed at Tertiary Care Hospital. OP compounds were the most common among poisons. Most of the middle age people were common victims of poisoning. Educational awareness, poison information, and standard therapeutic guidelines for poisoning cases will help to reduce the growth of public health problems.

**Keywords:** Standard therapeutic guidelines, Drug overdose, toxicology, Poisoning.

## Resumen

**Objetivo:** El objetivo de la investigación es preparar y aplicar las directrices terapéuticas estándar para los casos de envenenamiento en un hospital de atención terciaria, Mysuru, India. También tiene como objetivo identificar los agentes comunes asociados a los casos de envenenamiento y estudiar los resultados e identificar los tipos de venenos, la vía de administración y los resultados de los casos de envenenamiento.

**Metodología:** Se realizó un estudio observacional retrospectivo en un hospital de atención terciaria durante 6 meses. Se recogieron todos los datos necesarios en un formulario de recogida de datos bien diseñado. Se prepararon directrices terapéuticas estándar con la referencia de libros de texto de toxicología médica modernos, artículos de investigación de la tabla de tratamiento de intoxicaciones de pacientes y otras directrices nacionales.

**Resultado:** Se estudiaron las fichas de casos de intoxicación de un total de 50 pacientes. La mayoría de los pacientes con casos de envenenamiento se encontraban en el grupo de edad de 31 a 40 años (32%), seguidos por el grupo de edad de 41 a 50 años (24%), el grupo de edad de 0 a 15 años (14%), el grupo de edad de 21 a 30 años (12%), el grupo de edad de 51 a 60 años (12%) y el grupo de edad de 16 a 20 años (6%). Entre ellos, un número significativo de casos de intoxicación muestra la duración de la estancia hospitalaria. La mayoría de los pacientes del estudio tuvieron una estancia hospitalaria más corta. Encontramos que 32(64%) de los pacientes con intoxicación tuvieron una estancia más corta de 3-5 días en el hospital, seguido por 16(32%) de la estancia hospitalaria del paciente fue de 6-8 días, 1(2%) pacientes de 0-2 días y 1(2%) pacientes de 9-11 días. La mayoría de los pacientes con intoxicación estaban casados 33(66%) que los solteros 17(34%). Entre los pacientes con intoxicación, 9 (18%) tenían seguro médico y 41 (82%) no tenían seguro médico. El patrón de envenenamiento en el estudio, el más común fue OP 14(28%), paracetamol 6(12%), carbamato 5(10%), piretroide 4(8%), fosforo de aluminio 4(8%), acetona 3(6%), eucalipto 2(4%), mordedura de serpiente 2(4%), benzodiazepinas 1(2%), etanol 1(2%), HCL 1(2%), queroseno 1(2%), metformina 1(2%), metoprolol 1(2%), naftalina 1(2%), fenitoína 1(2%), ácido sulfúrico 1(2%), organoclorados 1(2%). Entre todos los casos de intoxicación, el 50% de las sustancias asociadas a la intoxicación eran pesticidas, el 12% venenos químicos, el 10% hidrocarburos, el 10% antipiréticos analgésicos, el 6% venenos neurotóxicos, el 4% venenos orgánicos, el 4% otros fármacos. 93 El 9% de las intoxicaciones se debieron a la exposición oral, el 2% a la exposición ocular, el 2% a la exposición dérmica y el 2% a la exposición por inhalación. También se encontró que el 84% fueron intoxicaciones deliberadas y el 16% fueron intoxicaciones accidentales.

**Conclusión:** Se elaboraron las Guías Terapéuticas Estándar para 60 sustancias/compuestos asociados a la intoxicación. Las guías terapéuticas estándar ofrecen servicios de información toxicológica a los profesionales de la salud y a los pacientes en la identificación de los venenos, los síntomas, los antídotos y el manejo de los casos de envenenamiento. Se hizo un seguimiento de un total de 50 hojas de casos de intoxicación en el Hospital de Atención Terciaria. Los compuestos OP fueron los más comunes entre los venenos. La mayoría de las personas de mediana edad fueron víctimas habituales de envenenamiento. La concienciación educativa, la información sobre venenos y las directrices terapéuticas estándar para los casos de envenenamiento ayudarán a reducir el crecimiento de los problemas de salud pública.

**Palabras clave:** Directrices terapéuticas estándar, sobredosis de drogas, toxicología, envenenamiento.

## Introduction

Deliberate self-harm and self-injurious behaviors are major public health problems globally<sup>1</sup>, particularly amongst young people<sup>2</sup>. According to the World Health Organization (WHO) above 800,000 individuals end it all and 10-20 million individuals endeavor purposeful self-harm worldwide consistently<sup>3</sup>. It is estimated the Asian mainland contributes approximately 60% of worldwide suicides<sup>4</sup>.

Poisoning is a health concern in both created and developing countries. Yearly, numerous people are inebriated either purposefully or accidentally, a condition that brings about a significant expansion in the morbidity and mortality rate<sup>5,6</sup>.

The medical management of poisoning crises is troublesome and, to date, there are no obvious proof-based rules for the best management of the greater part of the poisoning, with the accessibility of countless synthetic substances and medications, intense poisoning is a typical medical crisis in any country.<sup>7</sup> The specific incidence of this issue in our nation stays questionable however it is estimated that around 10-15 million cases of poisoning are accounted for each year, of which, above 50,000 pass on.<sup>8</sup> Cases of poisoning might be treated in

many spots, for example at the location of the accident, during transport, in an emergency clinic. The kind of care that can be given will rely upon whoever connects with the patient and in what conditions. Certain individuals from the local area, like firemen, policemen, teachers, may as often as possible be quick to be confronted with poisoning cases.<sup>7,8</sup>

In rural areas, nurses and primary health care workers, and even agronomists and veterinaries, may have to deal with poisoned persons. They all need at least some basic training in first aid as well as decontamination and measures for their protection. General practitioners or family doctors are often the first medically qualified persons consulted. They must be able to give appropriate initial.<sup>8</sup>

Treatment and may need to contact their local poison information center. Most patients with serious poisoning, if they survive, will sooner or later reach a hospital, ideally one with a wide range of medical facilities, including intensive care. In some places, specialized treatment services have been established offering the best possible conditions for the management of poisoning. These services also have the advantage of ready access to a wide range of related medical facilities.

Most cases of poisoning, however, will be treated through a country's normal health service facilities, usually at a general hospital, far from a poison information center, and without access to a specialized clinical toxicology unit.<sup>9</sup>

In an emergency, the relevant medical personnel at general hospitals and other health service facilities where poisoning cases are treated must have rapid access to toxicological information and experience. Here, the poison information center plays a key role through its telephone advice service. Ideally, centers should circulate information to general hospitals and other health service facilities regularly.<sup>10,11</sup>

This information should be adapted to suit local needs and should include general advice on the diagnosis and management of poisoning cases commonly expected to be treated at the particular hospital or facility, as well as information on new developments in patient management and on new types of poisoning.<sup>12</sup>

Death due to poisoning has been known since time immemorial. Poisoning is a major problem all over the world, although its type and the associated morbidity and mortality vary from country to country. According to the legal system of our nation, all poisoning passing cases are recorded as unnatural demise and a medico-legal autopsy is routine. Toxicology is characterized by the investigation of the impacts of substance specialists on biological materials. Current toxicology is a multidisciplinary science and legal toxicology is needed to decide any exogenous substance specialist present in biological specimens made accessible regarding medico-legal investigations.<sup>13</sup>

Organophosphorus poisoning happens ordinarily in southern India, where ranchers structure a significant extent of the populace who regularly use organophosphorus compounds like parathion as insecticides. Accordingly, because of the easy openness of these compounds, an enormous number of self-destructive cases are experienced in this region.<sup>14</sup> Furthermore, snakebite is a typical intense medical crisis looked at by rustic populaces in tropical and subtropical countries with heavy rainfall and humid climate.<sup>15</sup> Some 35,000-50,000 individuals pass on every year from snakebite, which is a typical reason for morbidity and mortality in India.<sup>16</sup>

Organophosphorus (OP) compounds have been generally utilized for years and years in horticulture for crop assurance and nuisance control, thousands of these compounds have been screened and more than 100 of them have been advertised for these purposes<sup>17</sup>. Operations comprise a heterogeneous class of synthetic substances explicitly intended for the control of nuisances, weeds, or plant diseases. Their application is as yet the best and acknowledged means for the assurance of plants from bothers, and has contributed significantly to upgraded agricultural productivity and crop yields<sup>18</sup>.

There is a need, especially for the people that have high frequencies for certain methods of drug use, to understand the factors involved in poisoning and how to effectively design prevention programs to reduce their occurrence and adverse outcomes. Also for effective management of an acutely poisoned victim and to familiarize the physicians about various steps required in the effective management of patients with acute poisoning.

## Materials and methods

This is an observational, retrospective study. This study was conducted in the Departments of Clinical Pharmacy, over 6 months from September 2019 to March 2020. The approval for this study was obtained from The Institutional Ethics Committee (IEC) of Farooqia College of Pharmacy, Mysore at Clinical Pharmacy Department for conducting our project work based on our presentation given for the same to the committee members. Modern Medical Toxicology textbook, Patient case sheets, Research articles, and National guidelines.

### Study Procedure

Standard therapeutic guidelines were prepared with the reference of modern medical toxicology textbooks, patient poisoning treatment chart research articles, and other national guidelines.

- The data collection form was designed to collect and document the data.
- All the needful and applicable information was collected in a distinctive form.
- Data abstracted from patients' medical records including age, gender, date and time of the admission and discharge, marital status, insurance coverage, chief complaint, and vitals.
- This investigation was used to assess the circumstances of the poisoning including accidental or intentional. The rate of hospitalization and the outcome of poisoning events were examined. This study has evaluated the length of stay and the casualty rates that have occurred and the outcome of the case were examined.
- Finally, all the data were collected to generate graphical representation, tables using MS Excel.

## Result and discussion

The medical management of poisoning emergencies needs evidence-based standard therapeutic guidelines for the best management of most of the poisoning. Prepared the Standard therapeutic guidelines for 60 substances/chemicals associated with the poisoning. Standard therapeutic guidelines offer toxicological information services to health professionals and patients in identifying poisons, symptoms, antidotes, and management of poisoning cases.

A total of 50 patients' case sheets of poisoning cases were studied. All necessary data were collected in a well-designed data collection form. We mainly focused on the poisoning cases. As it is the need of the hour issue. The majority of patients with poisoning cases were found in the age group of 31-40 years (32%), followed by the age group of 41-50 years (24%), age group of 0-15 years (14%), age group of 21-30 years (12%), age group of 51-60 years (12%) and age group of 16-20 years (6%).

Among them, a significant number of poisoning cases show the duration of hospital stay. The majority of patients in the study had a shorter stay in the hospital. We found 32 (64%) of patients with poisoning had a shorter stay of 3-5 days in the hospital, followed by 16 (32%) of patient's hospital stay was 6-8 days, 1 (2%) patients for 0-2 days and 1 (2%) patients for 9-11 days. The majority of patients with poisoning were married 33 (66%) than unmarried 17 (34%). Among patients with poisoning 9 (18%) had health insurance and 41 (82%) did not have health insurance. **Table I.**

**Table I:** demography of study patients.

| No of pateint                    | % of pateint |       |
|----------------------------------|--------------|-------|
| <b>GENDER</b>                    |              |       |
| <b>MALE</b>                      | 30           | 6000% |
| <b>FEMALE</b>                    | 20           | 40    |
| <b>Age details</b>               |              |       |
| <b>0-15</b>                      | 7            | 14    |
| <b>16-20</b>                     | 3            | 6     |
| <b>21-30</b>                     | 6            | 12    |
| <b>31-40</b>                     | 16           | 32    |
| <b>41-50</b>                     | 12           | 24    |
| <b>51-60</b>                     | 6            | 12    |
| <b>Duration of hospital stay</b> |              |       |
| <b>0-2 day</b>                   | 1            | 2     |
| <b>3-5 day</b>                   | 32           | 64    |
| <b>6-8 day</b>                   | 16           | 32    |
| <b>9-11 day</b>                  | 1            | 2     |
| <b>Marital status</b>            |              |       |
| <b>Married</b>                   | 33           | 66    |
| <b>Unmarried</b>                 | 17           | 34    |

The pattern of poisoning in this study, the most common being OP in 14(28%) patients, Paracetamol 6(12%), Carbamate 5(10%), Pyrethroid4(8%), Aluminium phosphide 4(8%), Acetone 3(6%), Eucalyptus 2(4%), Snake bite 2(4%), Benzodiazepines1(2%), Ethanol 1(2%), Hcl 1(2%), Kerosene 1(2%), Metformin 1(2%), Metoprolol 1(2%), Naphthalene 1(2%), Phenytoin 1(2%), Sulfuric acid 1(2%), Organochlorine 1(2%). The results are presented in **table II.**

Among all the poisoning cases 50% of substances were associated with poisoning of pesticides, 10% of substances were hydrocarbons, 12% were chemical poisons, 10% were analgesic-antipyretics, 6% were neurotoxic poisons, 4% were organic poisons, 4% were corrosive poisons, 4% were other drugs. The results are presented in **table III.**

**Table II:** Pattern of poisoning.

| Name of a substance/poison | Number of people | % of patient |
|----------------------------|------------------|--------------|
| <b>Organophosphate</b>     | 14               | 28           |
| <b>Paracetamol</b>         | 6                | 12           |
| <b>Carbamate</b>           | 5                | 10           |
| <b>Pyrethroid</b>          | 4                | 8            |
| <b>Aluminium phosphide</b> | 4                | 8            |
| <b>Acetone</b>             | 3                | 6            |
| <b>Eucalyptus</b>          | 2                | 4            |
| <b>Snake bite</b>          | 2                | 4            |
| <b>HCL</b>                 | 1                | 2            |
| <b>Sulfuric acid</b>       | 1                | 2            |
| <b>Metoprolol</b>          | 1                | 2            |
| <b>Naphthalene</b>         | 1                | 2            |
| <b>Phenytoin</b>           | 1                | 2            |
| <b>Metformin</b>           | 1                | 2            |
| <b>Benzodiazepine</b>      | 1                | 2            |
| <b>Ethanol</b>             | 1                | 2            |
| <b>Kerosene</b>            | 1                | 2            |
| <b>Organochlorine</b>      | 1                | 2            |

**Table III:** Types of poison.

| Type of poisons               | % substance |
|-------------------------------|-------------|
| <b>Pesticides</b>             | 50%         |
| <b>Hydrocarbons</b>           | 10%         |
| <b>Analgesic-Antipyretics</b> | 10%         |
| <b>Chemical Poisons</b>       | 12%         |
| <b>Neurotoxic Poisons</b>     | 6%          |
| <b>Organic Poisons</b>        | 4%          |
| <b>Corrosive Poisons</b>      | 4%          |
| <b>Other Drugs</b>            | 4%          |

Among all the poisoning 46 (93.9%) were due to oral exposure, 1 (2%) were due to eye exposure, 1 (2%) were dermal exposure, 1 (2%) were inhalation exposure. The results are presented in **table IV** among all the poisoning, 42(84%) were deliberate poisoning, 8(16%) were accidental poisoning. Among all the patients, 46(92%) patients survived, 4(8%) patients expired.

**Table IV:** Pattern for the route of administration.

| Route of administration    | % substance |
|----------------------------|-------------|
| <b>Oral exposure</b>       | 93.90%      |
| <b>Dermal exposure</b>     | 2%          |
| <b>Eye exposure</b>        | 2%          |
| <b>Inhalation exposure</b> | 2%          |

The pattern of poisoning in the study, the most common being OP 14(28%), Paracetamol 6(12%), Carbamate 5(10%), Pyrethroid 4(8%), Aluminium phosphide 4(8%), Acetone 3(6%), Eucalyptus 2(4%), Snakebite 2(4%), Benzodiazepines 1(2%), Ethanol 1(2%), HCL 1(2%), Kerosene 1(2%), Metformin 1(2%), Metoprolol 1(2%), Naphthalene 1(2%), Phenytoin 1(2%), Sulfuric acid 1(2%), Organochlorine 1(2%). Among all the poisoning cases 50% of substances associated with poisoning were pesticides, 12% chemical poisons, 10% hydrocarbons, 10% analgesic antipyretics, 6% neurotoxic poisons, 4% organic poisons, and 4% other drugs. 46(93.9%) of poisoning were due to oral exposure, 1(2%) eye exposure, 1(2%) dermal exposure, and 1(2%) inhalation exposure. We also found that 84% were deliberate poisoning and 16% were accidental poisoning.

## Conclusion

Poisoning and drug overdose (DO) are important health problems in developing countries. These emergencies are associated with high mortality and morbidity. The medical management of poisoning emergencies needs evidence-based standard therapeutic guidelines for the best management of most of the poisoning. The relevant medical personnel at general hospitals and other health service facilities where poisoning cases are treated must have rapid access to toxicological information.

The medical management of poisoning emergencies needs evidence-based standard therapeutic guidelines for the best management of most of the poisoning. Prepared the Standard Therapeutic Guidelines for 60 substance/compounds associated with the poisoning concerning modern medical toxicology textbooks, patient poisoning treatment chart research articles, and other national guidelines. Standard therapeutic guidelines offer toxicological information services to health professionals

and patients in identifying poisons, symptoms, antidotes, and management of poisoning cases. OP compounds were the most common among poisons. Most of the middle age people were common victims of poisoning. Among them, a significant number of poisoning cases show the duration of hospital stay. The majority of patients in the study had a shorter stay in the hospital. We found 32 (64%) of patients with poisoning had a shorter stay of 3-5 days in the hospital, followed by 16 (32%) of patient's hospital stay was 6-8 days, 1 (2%) patients for 0-2 days and 1 (2%) patients for 9-11 days. Among all the poisoning cases 50% of substances associated with poisoning were pesticides, 12% chemical poisons, 10% hydrocarbons, 10% analgesic antipyretics, 6% neurotoxic poisons, 4% organic poisons, and 4% other drugs. The overall case-fatality report in our study was 8%, there were 4 mortalities among which the poisons used were OP (2) and carbamate (2).

## Interests conflict

The researchers declare that they have no conflict of interest.

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