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Review Article

Poison information centre: A priority not to be ignored anymore

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Abstract

Poisoning cases are treated at different levels of healthcare facilities including both government and private sectors. However, owing to the lack of a Poison Information Centre (PIC), management of acute poisoning cases is a difficult task for physicians working in emergency departments at various medical establishments. PICs can provide information which plays an essential part in a country's capacity for ensuring the safety of chemical substances. The primary aim of PIC is to reduce morbidity and mortality due to poisoning and improve the patient's quality of life. Timely availability of appropriate information for poison management is provided by PIC through a well-trained poison information specialist.

Key words*:* Poison Information Centre (PIC); Poison Control Centre; poison information specialist; acute poisoning; pesticides; mortality

Introduction:

Poisoning is a significant global public health problem with nearly a million deaths reported each year. According to the National Crime Records Bureau (NCRB) 2021 data, there were a total of 1,64,033 suicides reported in the country during 2021 showing an increase of 7.2% in comparison to the previous year. 41,197 people committed suicide by consuming poison in 2021, which is again higher than in 2020.[1]

The most common poisonings in India involve insecticides, rodenticides, snakebites, alcohol, sedative-hypnotics, opioids, and pain medication.[2] Out of all these, the intake of pesticides either accidentally or intentionally is rising throughout India, where more people are involved in agricultural work or have access to these poisonous substances in day-to-day activities.

Most of the cases are reported to healthcare facilities in a critical stage with limited history. Hence, saving lives in such situations becomes challenging for treating physicians. Many a time, due to lack of history and diagnosing facilityit took lots of time to come to conclusions about the causative agent. Hence, the physician has to start the treatment based on clinical signs and symptoms. To overcome the issue and help the physicians so that timely management can be delivered, the concept of a poison information centre (PIC) came into the limelight.

Developed countries have excellent reporting and recording systems with the involvement of poison control centres, whereas in India there is no central registry for poisoning cases. It reflects in the mortality rate due to poisoning in developed countries which is only 1–2%, whereas India reports a rate between 15 and 30%.[3]It seems to be even higher as most of the cases in the periphery are not recorded.

PIC at its initial phase

The concept of PIC came into the picture long back with an idea to provide definite information on

prevention, early diagnosis and treatment of poisoning and hazard management around the clock. The first PIC in the world was established in Chicago (IL) in 1953and the first in Europe was founded in the Netherlands in 1960.[4,5,6]More centres were subsequently established around the world.

Indian Scenario:

Following Bhopal Gas Tragedy, an Inter-ministerial group strongly supported the idea of setting up Poison Information Centres in India. The first PIC in India was established at AIIMS New Delhi in 1995.[7]Although, some PICs have been started thereafter in various parts of India; only a few are accredited by WHO. Without getting accreditation, the sole purpose of starting PIC is questionable.

Following are the PICs recognised by WHO in India till date:[8]

- National Poisons Information Centre-All India Institute of Medical Sciences, New Delhi
- Poison Information Centre- National Institute of Occupational Health, Gujarat
- Poison Control, Training and Research Centre-Tower Block II, Chennai
- Poison Control Centre-Amrita Institute of Medical Sciences & Research, Kerala
- CEARCH (Center for Education, Awareness and Research on Chemicals and Health) - Supath II, Vadaj, Gujarat
- Manipal Poison Information Center-Kasturba Hospital, Manipal
- JSS Poison Information Centre-Dept. of Clinical Pharmacy, Mysore
- Poison Information Centre, Christian Medical College, Department of Medicine Unit 1, Vellore
- Poison Information Centre-R G Kar Medical College, Kolkata

Nearly after six decades after starting the first PIC in the world and three decades after starting the first PIC in India there are only nine World Health Organisation (WHO) recognised Poison Information Centres existing in India.[9]In a highly populated country like India, at least one Poison Information Centre is needed in each state.

Need of PIC:

Timely relevant information provided can surely help in reducing morbidity and mortality. Based on the information, even mild cases can be treated by first-aid measures alone or in periphery centres. Considering the severity, cases which need special facilities and equipment for treatment; are sent directly to tertiary care hospitals. If a particular case is reported frequently, specific antidotes, therapeutic agents, and medical equipment can be made more easily available. It will prevent the unnecessary expensive sophisticated treatments which are usually done if the cause is unknown to rule out other things.

Another advantage is knowledge about the epidemiological basis for local toxicovigilance. It can be used as an educational and training tool for a special group of people. Poison information centres are important sources of information on human toxicology. Taking into consideration all the advantages, the World Health Organization (WHO) recommends that all countries should establish and strengthen their poison centres. However, even after the guidelines fewer than half of its member states have done it.

Industrial Accidents and PIC:

- The Bhopal gas tragedy was a chemical accident that happened on the night of 2nd December 1984 at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal, Madhya Pradesh, India. It is considered as the world's worst industrial disaster, taking the lives of over 2,259 people due to exposure to the highly toxic gas Methyl Isocyanate (MIC).[10]
- On 12th June 2014, six people died in Bhilai Steel Plantfrom Carbon Monoxide leakageresulting from the breakdown in the water pump house, which seeped into the premises due to pressure differences along the purification chamber lines.[11]
- The Vizag gas leak was another industrial accident that occurred at the LG Polymers chemical plant during the early morning of 7th May 2020. The resulting vapour cloud spread over a radius of around 3km, affecting the nearby areas and villages. As per the National Disaster Response Force (NDRF), the death toll was 11, and more than 1,000 people became sick after being exposed to the gas. Preliminary investigations concluded that the accident was likely the result of insufficient maintenance of units storing the styrene monomer.[12]
- In December 2020, an acute neurological disease broke out in the Eluru district of Andhra Pradesh. The cause was initially unknown, but on 20th

December, AIIMS Mangalagiri and NEERI Research Institute came to the conclusion that pesticides leaching into the water supply is the most likely reason. Mahesh Kumar Mummadi et al. concluded that Triazofos (Organophosphate) pesticide contamination of water was a probable cause of the outbreak.[13]

It is obvious that when an industry is situated near people's inhabitants and if the toxic waste from them is not streamlined or there is a breach of guidelines, it affects the people directly. So, it is of utmost importance that the medical facility nearby should have knowledge about the chemicals used in such facilities and if people come in contact with them accidentally, what are the ill effects it causes and how they present to the nearby healthcare facility. They should have protocol and proper antidote, medicine, and equipment to handle it efficiently.

In either of the incidents mentioned above, there was no proper protocol in place at the healthcare facility nearby and all were in panic mode. The sad part is that even after almost four decades after the Bhopal Gas tragedy which shook the whole world, we don't have a mechanism to address it. It is also seen in the recent Vizag gas leak and Elluru mysterious illness where people went into a panic mode not knowing what leakage from industry could have caused these things. Even after knowing the agent in Vizag (styrene gas), no one was aware of the gas that can be emitted out in away, and it can cause such kind of illness and there is no preparedness either in diagnosing or in treatment part.

PIC could have been of great help in such situations by providing toxicovigilance with an active process of identification and evaluation of toxic risks in the community based on enquiries addressed. PIC also can alert the regulatory or health authorities to take appropriate preventive measures. It can take part in teaching medical toxicology to health professionals and in handling hazardous material emergencies. It can guide the health authorities to make antidote banks for those which are not easily available and may be required at any point in time in the region.

How To Set Up PIC:

The following are the requirements for starting a PIC:

- ***Space*** **:** Preferably a room attached to the Trauma & Emergency department of the hospital.
- ***Manpower*****:** Poison Information Specialist (PIS) - Any Person Qualified in Medicine (MBBS or MD), Toxicology (MSc or PhD), or Forensic Medicine (MD)
- ***Poison Information Resources*****:**

o Journals related to medicine and toxicology, in order to keep update dab out recent advances in toxicology.[14]

o Databases like Micromedex or Toxinz for quick retrieval and sharing of information.[15]

o Standard textbooks related to toxicology, medicine, chemistry, pharmacology, analytical toxicology, animal, and plant toxins of the region.[16]

It is essential to have all the above-mentioned resources and PIS should have basic knowledge of computer and software skills to use all types of resources efficiently to provide correct and relevant information.

- ***Minimum Equipment Required***

Items	Quantities
Desktop Computer Table	1
Desktop computer	1
Desk/Office Chair	1
Visitors Chair	2
Colour printer	1
Refrigerator	1
Almirah	1
Smart Phone	1
Headset	1
Database (MICROMEDEX 2.0)	1
Glass Display Board (Information details)	4
Hard Disk (Back up)	1
Cordless Telephone	1
Toll-free Number dedicated to PIC	1
SIM card dedicated to PIC	1

Choosing A Database:

There are numerous databases available relating to poisons and drugs with varying costs requiring annual subscriptions. It is of utmost importance to choose a proper database based on experience shared by previous users and the company's credibility in having such software.

The database should have comprehensive coverage for identifying ingredients for hundreds of thousands of commercial, biological and

pharmaceutical products with risks and treatment protocols for exposure. It should provide the information rapidly and should have easy access for handling medical staff. Most of the databases provide a user manual for usage and online demonstration with hands-on training.

Smooth Running of PIC:

Once it started, the following things should be kept in mind for the smooth running of the centre:

- Access should be available round the clock (24X7)
- It should be available for the public as well as to health care professionals.
- The person providing information should be well-versed in the local language as well as in English.
- There should be no hesitancy in contacting seniors for help.
- Online clinical toxicology information, to deal with straightforward poisoning cases can reduce the number of telephone enquiries, thereby potentially increasing the population size that can be served by a single centre.

The flowchart for works that must be done once we receive a call is given below:

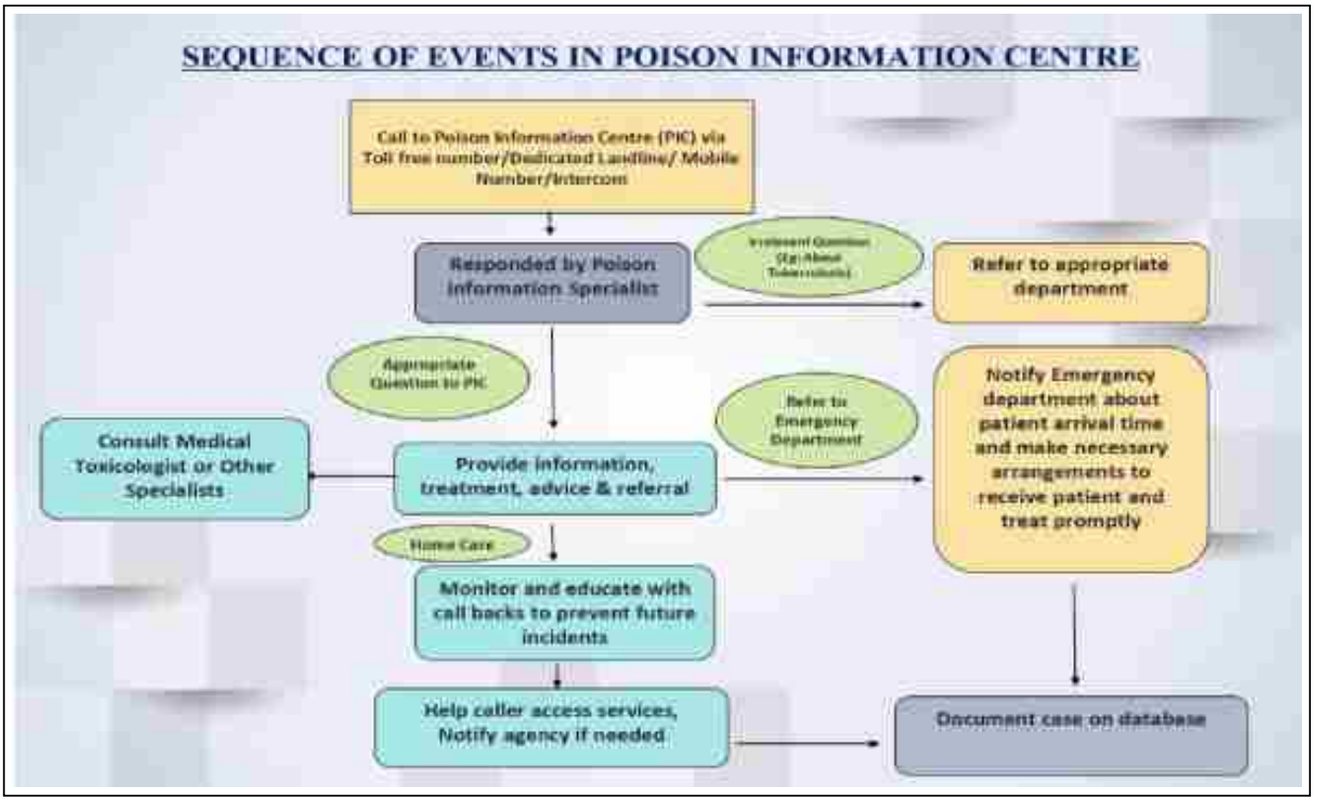
Next Step After Setting Up of PIC:

Once the PIC is set, the work has not ended; it had just started. The PIC facility which has been started should be advertised in newspapers, channels, fliers, and banners to make common people aware in nearby places. For professionals, seminars and workshops can be conducted periodically. We should try to get accredited by World Health Organization: Regional Advisor (SEARO, New Delhi)

Conclusion:

PICs can reduce the morbidity and mortality caused due to poisoning and improve the quality of life. In cases of chemical accidents, they should be prepared enough to provide adequate information rapidly in the acute phases. While building up toxicological data banks, centres should therefore include information on all chemicals likely to be involved in accidents in the region, without overlooking the less frequently used industrial chemicals and reactive intermediates.

Timely provision of poisoning information by the centre is very important to provide appropriate guidelines for management as per the needs of the enquirer. Thus, PICs play a crucial role in the prevention and management of poisoning cases through the provision of information to the public and healthcare professionals.



Recommendations:

- We recommend that each medical college should come up with the idea of starting a PIC. Although, getting financial approval from the authority may be a little bit troublesome in some areas; until we start the proceedings we cannot think about the future.
- Provision for reporting all poisoning cases either directly or indirectly from all the health care facilities to concerned PIC(s). It can help the physicians as well as government to tackle any kind of poisoning at the earliest and prepare necessary preventive measures.

Conflict of interest: Declared none

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