

Toxicovigilance: Boon for Community Health

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Abstract

Death due to poisoning has been known since time immemorial. Poisoning is a major problem all over the world mainly for developing countries like India. In advancement of human civilization there is a huge change in day today life. In modernization of society people's interpretation about their own image gets influenced by changing motivation and needs. Toxicovigilance is active process of identifying and evaluating the toxic risk existing in community and evaluating measure taken to reduce or eliminating them. The factors responsible for poisoning are easy availability of poison, much economic and poor control of regulating authority. Illiteracy, improper knowledge and over use are causing additional damage. It's important to study and do organized multidisciplinary approach of prevention and treatment towards it. For this poisoning cases admitted to the tertiary care centre should be studied for cause, symptoms and treatment. Data should be obtained from case

reports, detail history should be obtained from close relatives, pathological reports, digital media and textbooks. According to WHO among overalls diseases, 85% diseases caused by numerous poisons which are surrounds us from kitchens to our work stations, can cause diseases like skin infections, multi organ failure up to dangerous life threatening conditions. Toxicovigilance can be a boon for community health in such circumstances.

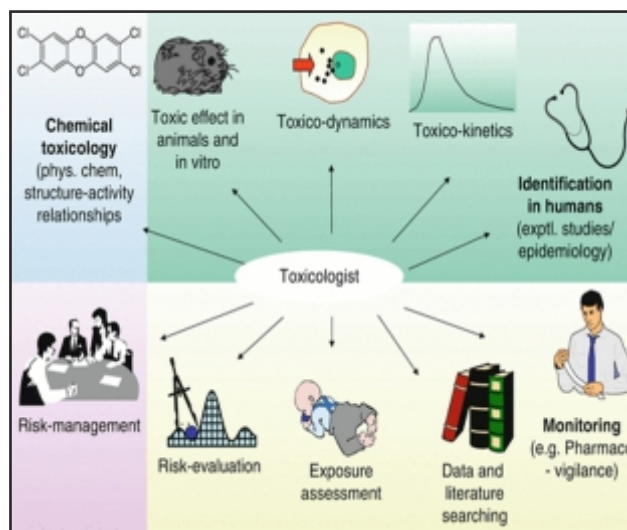
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Introduction

Toxicovigilance is the active process of identifying and evaluating the toxic risks existing in a community, and evaluating the measures taken to reduce or eliminate them. It involves the analysis of poisons centre enquiries to identify whether there are specific circumstances or agents giving rise to poisoning, or certain populations suffering a higher incidence of poisoning⁽¹⁾.

Toxicology is the study of how natural or man-made poisons causes undesirable effects in living organisms. Those substances damages to either the survival or normal function of the individual. or can cause injury⁽²⁾.

Every individual is exposed to toxic chemicals, usually in minute, subtoxic doses, through environmental and food contamination. In some instances, people may be subjected to massive, or even fatal, exposure through a chemical disaster or in a single accidental or intentional poisoning. Between these two extremes there exists a wide range of intensity of



exposure, which may result in various acute and chronic toxic effects. Such effects clearly lie in the public health domain, particularly in cases of chemical contamination of the environment that may result in exposure of an unsuspecting public. The situation is similar to, but subtler than, exposure to infectious diseases. Although chemicals may be absorbed in small quantities, they do not induce pathological signs. The worldwide frequency of major incidents involving chemicals, i.e. incidents that could cause multiple deaths, has been rising during the past two decades. There is growing concern about the possible health consequences of chronic exposure to naturally occurring toxic substances and to man-made chemicals and waste.^(3,4)

The principal toxic risks that exist in any country may be readily identified by surveys of hospital accident and emergency wards, forensic departments, and rural hospitals in agricultural areas. The growing incidence of poisoning from accidental exposures to chemicals, recent examples of Delhi pollution, acute poisoning in local populations as a

result of industrial and transport accidents involving chemicals have highlighted the importance of countries having special programmers for poison control and in particular the facilities for diagnosis treatment and prevention of poisoning. In India, the National Poisons Information Centre (NPIC) was established in February, 1995 in the Department of Pharmacology at the All India Institute of Medical Sciences, New Delhi. The centre provides toxicological information and advice on the management of poisoned patients adopted to the level of the enquirer. The basis of this service is the databases on poisoning, drug reactions and also the continuous and systematic collection of data.⁽⁵⁻⁷⁾

Material and Methods

Various compendia of different authors referred for the study. Supportive text of contemporary science was utilized. Various references from internet and journals also used in this study. Web search and peer reviewed journals were also revised to learn present knowledge on this topic.

General Principles of Poisoning

Poisons can be swallowed, absorbed through the skin, injected, inhaled or splashed into the eyes. A medication overdose is the most common form of poisoning in the World. This can include both over-the-counter medications, such as paracetamol, and prescription medications, such as antidepressants etc. Other potential poisons include household products, such as bleach, cosmetic items, such as nail polish, some types of plants and fungi, certain types of household chemicals and pesticides, carbon monoxide, poorly prepared or cooked food, and food that's gone moldy or been contaminated with bacteria from raw meat (food poisoning), alcohol if in an excessive amount is consumed over a short period of time (alcohol poisoning), recreational drugs or substances, medicines prescribed for pets, snakes and insects, such as wasps and bees, aren't poisonous but their bites or stings can contain venom (toxin).

Sign and symptoms after Exposure

Muscle spasms and cramps from pesticide exposure may be immediate but may be a delayed reaction by as much as 3 days up to 6 weeks. Diarrhea generally begins within ten minutes to half an hour of an exposure and lasts several hours, but may begin as much as 2-3 hours later if the exposure is not severe. It is often followed a day or more later with constipation and light colored, smelly bowels, among other symptoms, if the toxins have killed the bowel flora. Toxins may be obvious but often are not obvious. Toxins may be such things as pesticides, natural gas or gasoline leaks, carbon monoxide, or industrial effluent. Even very small amounts of these can have an enormous impact, particularly if you are exposed repeatedly or for a long time. Toxins may be less

obvious, hidden in perfume, carpets or carpet glue, shampoo, shaving cream, aftershave lotion, lotion, cosmetics, detergents, soaps, cleaning chemicals, dry cleaned clothes, turpentine, various other solvents, as formaldehyde treatment on bedding or carpet, photographic chemicals, unseen mold, etc.

With repeated exposure a time comes when the taste of the chemicals hang on the tongue, pervade the sinuses and won't go away. Brain fog, dizziness, muscle pain and spasms, joint pain, bone pain and density loss, back pain, wrist pain, foot pain, numb extremities, desensitized hands and feet, fatigue, rock hard body, twitching eye lids, peripheral vision losses, night vision losses, black under eyes, earache, swollen inner ears, ear discharge, sore throat, swollen lymph nodes, swollen belly, swollen head, swollen gums, tooth enamel erosion and weakening, irregular heart beat, rhinitis, hair loss, deformed nails, rash of several types, hives, loss of libido, impotence, coldness, cold hands and feet, inability to adjust ones internal thermostat, excess menstrual bleeding, amenorrhea, sleep disturbance, failure to sweat, failure to moisturize skin, failure to moisturize eyes alternating with excessive tearing, failure to moisturize mouth and throat, failure to absorb nutrients from food, constipation and gas anaphylaxis-these are some of the various symptoms of acute and cumulative pesticide exposure.⁽⁷⁻¹²⁾

Risk Assessments and hazard:

A hazard is any source of potential damage, harm or adverse health effects on organism, system and population exposed to that Risk agent. Risk is the chance or probability that a person will be harmed or experience an adverse health effect if exposed to a hazard.

Risk depend upon these factors:

- Inherent toxicity of chemical (hazard). 2. How much of chemical present in an environmental medium (air, soil, water). 3. How much contact person or ecological receptor has with chemical substance (exposure). : A hazardous chemical substance poses on risk if there is no exposure.
- The people who may be exposed to any chemical or toxic must take prevention to minimize the risk.
- Risk assessment is to have full understanding of nature, magnitude and Probability of potential adverse health or environmental effect of chemical. It taken in to account of both hazard and exposure.
- Risk assessment forms the foundation of regulating decision for industrial chemical, pesticides, pharmaceuticals, cosmetic, food additives and food contact substance in developed countries today.

Risk assessment consists of 3 steps:-

1. Hazard characterisation:- dose response determination (LD50 \NOAEL | T25 \EC50, NOEL etc) Determine the relationship between magnitude and severity of adverse effect.
2. Exposure assessment: Identifying to extent to which exposure actually occurs. Exposure levels are easily measured
3. Risk characterization: combining information from hazard characterization and exposure assessment in order to form conclusion about nature and magnitude of risk.

Prevention of exposure is part of the dynamic process of toxicovigilance, which includes identification and evaluation of toxic risks and phenomena, and communication with the authorities in order to plan and take action.

The aim of toxicovigilance is to monitor acute or chronic toxic effects for humans of exposure to a natural or systematic mixture or substance available in the market or found in environment for purpose of undertaking alert and prevention action. The mission includes toxicological expertise, advice for medical care and prevention by means of emergency telephone hotlines. Monitoring the cases of human poisoning falling within sphere of toxicovigilance.

Poison information centre have fundamental role in partnership with other in toxicovigilance and prevention which includes:

Monitoring toxic effect of drug overdose.

Monitoring toxic commercial product like household, chemical agents, Industrial products and pharmaceuticals.

Identifying serious poisoning risk in local community.

Reporting health authorities and other relevant bodies.

Prevention measure of cases of poisoning on the basis of available data on risk factor

Preventive activity should include educational campaigns, producing educational material and planning, in partnership with other, implementation and evaluation of preventive measure

Education to particular group who is in risk of toxic hazards.

Motivate to start the prevention program in rural and urban areas.

Data from poison information central, which may provide valuable information on cases of poisoning used for evaluation of preventive activities.

Drugs /Medicine

Only take prescription medications that are prescribed to you by a healthcare professional Misusing or abusing

prescription or over-the-counter medications is not a "safe" alternative to illicit substance abuse

Never take larger or more frequent doses of medications, particularly prescription pain medications, to try to get faster or more powerful effects.

Follow directions on the label when you give or take medicine

Turn on a light when you give or take medicines at night so that you know you have the correct amount of the right medicine

Keep medicines in their original bottles or containers

Monitor the use of medicines prescribed for children and teenagers,

Dispose of unused, unneeded, or expired prescription drugs

Always read the label before using a product that may be poisonous⁽¹³⁻¹⁷⁾

Conclusion

Death from acute poisoning is major public health issue in many countries. Most death are from self-poisoning which highly toxic pesticides, acute poisoning can be either intentional or accidental. The important role is to determine whether poisoning is caused by specific agents or circumstance or weather specific populations suffer from a high incidence of poisoning. Early identification of toxic risks associated with agents, we are better able to understand the underlying problem, identifying and evaluating the toxic risk existing in a community and evaluating the measure taken to reduce or eliminate them, validate treatment recommendations and collaborate with health and regulatory organizations to improve overall patient care.

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