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Review Article

Review on Types of Toxins (Pharmaceutical, Biological, Chemical)

Dr. Nagham Mahmood Aljamali[1*], Farah Wadai El-Taei[2], Doaa Alasady[3]
[1]Professor, Ph.D, Department of Chemistry, Synthetic Organic Field, Iraq
[2, 3]Assistant Lecturer, Department Medical laboratories Technique, Hilla University College, Babylon, Iraq

***Corresponding Author**
Dr. Nagham Mahmood Aljamali

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Abstract: The toxicity of a substance can be affected by many different factors such as the route by which the substance was introduced or administered (whether through application, contact with the skin, ingestion, inhalation, or direct injection), time or duration of exposure (short or long-term encounter) and the number of Exposure times (single doses or multiple doses over time), the physical form of the toxin (solid, liquid or gas), an individual's genetic makeup and general health, among many other factors. There are many terms used to describe these factors, such as acute exposure and chronic exposure: Acute exposure: It means the single exposure to a toxic substance that may cause severe biological damage or even death, and acute exposure is usually characterized by the duration of exposure does not exceed one day. Chronic exposure: Continuous exposure to a toxin occurs over a long period of time, often measured in months or years, and can cause irreversible side effects. Toxic as in pregnant women or those suffering from certain diseases, and when evaluating a new and previously unstudied chemical, it can be compared with the other studied substances if it is believed that the two substances are very similar, but with the addition of a safety factor of 10 to take into account the possible differences between them, although the differences do not require in Usually such a level of safety is, because this approach is a very conservative approximation to allow it to be applied to a wide range of materials.

Keywords: Drugs poisoning, toxic, chemical toxin, biological toxin, pharmaceutical toxin.

INTRODUCTION

Poisoning is the harmful effect that occurs when a toxic substance is swallowed or inhaled or upon contact with the skin, eyes, or mucous membranes, such as those in the mouth or nose. Possible toxicants include over-the-counter and prescription drugs, prohibited drugs, gases, chemicals, vitamins, food, mushrooms, plants, and animal poisons. Some toxins cause no harm, while others can cause severe damage or death1 [1]. The diagnosis is based on symptoms, information from the poisoned person and those present, and sometimes from urine and blood tests. Therefore, medicines should always be kept in their original containers, out of reach of children. Treatment involves supporting the person and preventing more venom from being absorbed and, sometimes, an increased excretion of the venom. More than two million people suffer from some form of poisoning in the United States each year. Prescription or over-the-counter and prohibited drugs are a common source of serious poisoning-related poisoning and death. Other common toxins include gases (such as carbon monoxide), household products , agricultural products, plants, heavy metals (such as iron and lead), vitamins, animal poison, and foods

(particularly certain types of mushrooms and fish). However, ingesting almost any substance in very large quantities can be toxic [2-4].

Types of Toxins

Types of poisoning: 1- chemical 2- biological 3- physical

Chemical toxic substances

They include inorganic substances such as lead, mercury, hydrofluoric acid, and chlorine gas, as well as organic compounds such as methanol, most medicines, and toxins from living organisms. While some radioactive substances are also chemical toxic substances, many of these The materials are chemically non-toxic as the results of radiation poisoning are due to exposure to ionizing radiation produced by radioactive materials rather than chemical reactions with these materials themselves[5].

Biological toxicants

These include bacteria and viruses that can cause diseases in living organisms. It is sometimes difficult to measure biological toxicity because, in theory, a single virus or bacterial cell - or perhaps a parasite or worm - can multiply to cause a very dangerous infection. Biological toxicity depends on the strength of the affected immune system and its ability to deal with the pathogen.

Physical toxic substances

They are substances that interfere and interfere with biological processes due to their physical nature, for example, coal dust, asbestos fibers and silicon dioxide granules, and all these substances, for example, can eventually lead to death if inhaled, corrosive chemicals It has physical toxicity because it destroys tissues, but it is not directly toxic unless it directly interferes with the biological activity of the organism. Water can act as a physical toxin if taken in very high doses because the concentration of vital ions decreases dramatically if there is a lot of water in the body. Not a chemical poisonous gas[6].

Types of Poisoning

Food poisoning

Food poisoning is a group of symptoms resulting from eating food contaminated with bacteria, or toxins produced by these organisms, and food poisoning results from eating food contaminated with various types of viruses, germs, parasites and toxic chemicals such as poisoning caused by eating mushrooms, and food poisoning is diagnosed if More than two people (three or more) have had symptoms of the disease. Food poisoning caused by bacteria is the main cause in more than 80% of food poisoning cases. Food poisoning usually results either as a result of bacteria excreting their toxins or as a result of bacteria multiplying inside the intestine and destroying the intestinal wall. Symptoms of food poisoning differ from the symptoms of other types of poisoning, as they focus on digestive symptoms such as vomiting, abdominal pain and diarrhea, and they usually appear on more than one person together[7,8].

Botulinum toxin botulism

Crystal Clear app kdict.png Main article: Sausage poisoning**.** The Clostridium botulinum bacterium is born in conditions in which oxygen is low, spores that resist heat and then grow and spread widely and then secrete toxins known as (botulinum toxin), which are considered a deadly type of poison as it impairs nervous functions and may result in muscular or respiratory paralysis In some cases, it may cause death, but it is considered a relatively rare and non-contagious disease, and there are 7 patterns of botulinum toxin symbolized by the English letters (A to (G), four of these patterns infect humans and cause human botulism poisoning and they are (A, B, E). In some rare cases, type F), while the other three types infect birds, mammals and fish and cause them some diseases. Human botulism is divided according to its source [8, 9].

Foodborne botulism and botulism

It is considered the main source of botulism, and it results from the consumption of foods, especially canned, preserved or home-fermented foods that are not well prepared. Symptoms of poison caused by germs appear within 12 to 36 hours of consuming the poisoned food and take from 4 hours to a maximum of 8 days after exposure. The incidence of botulism is low but results in a high mortality rate (5-10% of cases) if the patient is not diagnosed immediately and receives the necessary medical attention [10].

Inhalational botulism

It is a rare source of botulism that does not occur naturally but results from accidental or intentional events such as (bioterrorism) where the toxins are emitted by droplets (the lethal dose of botulism is 2 nanograms per kilogram of human weight), symptoms appear in a period Ranging from 24 to 72 hours. In the case of suspicion, the patient and everyone exposed to the spray should be placed under intensive care. The patient must be washed to remove the contamination and then change his clothes, taking into account that the contaminated clothes are kept in plastic bags and washed well with soap and wate[11].

Bronchial poisoning caused by wounds

It is also considered a rare source of botulism, and it occurs when spores enter the body through an open wound and then multiply in the anaerobic environment. Mostly, the wound is caused by injecting addictive substances such as black tar heroin, and symptoms appear in a period of up to two weeks. This type of poisoning affects infants under the age of six months and does not infect those older than that due to the presence of natural defensive fluids in the intestines, which help them to prevent the germ and prevent its formation and growth. in honey) and then turn into spores that spread in the stomach; Therefore, he warns against feeding honey to children under the age of one year[12].

Accidental Poisoning

Poisoning is the most common cause of non-fatal accidents in the home. Young children are especially susceptible to accidental poisoning in the home because of curiosity and a tendency to explore, and the elderly, who are often confused about their medications. Since children often share discs and items they find, siblings and playmates may also have been poisoned. People at risk of accidental poisoning are hospitalized people (due to medication errors) and industrial workers (due to exposure to toxic chemicals).

Deliberate Poisoning

Poisoning may be a deliberate attempt to kill or commit suicide. Most adults who attempt suicide by poisoning use more than one drug and also drink alcohol. Poisoning can be used to weaken a person (for example, to rape or rob a person). In rare cases, parents with a mental disorder poison their children to make them ill, thereby gaining medical attention (a disorder called Factitious Disorder)[13-18].

Toxic Compounds of Microbial Origin

Food Poisoning by Bacterial Toxins: Most cases (60-90%) of food poisoning are due to bacteria. Its causes, according to food intake, are characterized by:

- Poisoning (such as Staphylococcus aureus, Clostridium botulinum).
- Diseases caused by extensive contamination with experimental pathogens, such as Clostridium perfringens and Bacillus cereus.
- Infectious diseases caused by Salmonella or Escherichia coli Shigella.
- Diseases of unclear causes, such as those from Pseudomonas spp, Proteus spp.

The harmful activity of these bacteria in the digestive system is due to enterotoxins, which are divided into two groups, exotoxins (toxins secreted from microorganisms into the surrounding environment) and endotoxins (which remain inside the cells of microorganisms and are released when cells are destroyed). Exotoxins are released mainly by Gram-positive bacteria during their growth [19,20]. They are made up mostly of very toxic and antigenic proteins that become active after a quiescent period. This group includes toxins released by Clostridium botulinum (botulin toxin, a neurotoxic globular protein), C. perfringens and Staphylococcus aureus [21]. Poisoning with St. Aureus is the most common food poisoning, and its symptoms include vomiting, diarrhea, stomach pain, and its main cause is food of animal origin, meat and its products, poultry, cheese, potato salad, and pastries). The basis of endotoxins from Gram-negative bacteria, they act as antigens and bind tightly to the cell wall of bacteria and are complex in nature, consisting of protein, polysaccharides, and lipids. Endotoxins are relatively stable thermally, and are generally active without requiring an incubation period. The toxins that cause typhoid and paratyphoid, salmonellosis and bacterial dysentery are of this group. Salmonellosis is very dangerous and is an infection with toxins numbering about 300 species: but they are closely related organisms. The infection is characterized by internal fever, gastroenteritis, and salmonellosis septicemia: the sources of infection are different, but they are closely related organisms. The infection is characterized by endogenous fever, gastroenteritis and salmonellosis septicemia: egg products, frozen poultry, ground beef, candy products and coca are sources of infection [22-25]. The presence of E. coli bacteria first indicates the presence of fecal contamination, and this gives special attention. This bacterium introduces an endotoxin strain, a particularly dangerous strain that was discovered in 1983.

Mycotoxins

There are more than 200 mycotoxins produced under certain conditions by 120 species of fungi or molds. Mycotoxins of particular interest in food preservation and storage. Infection of rye and, to a lesser extent, other grains with the fungus Claviceps purpurea (ergot, or roostr's spur) is responsible for a disease called ergot poisoning (with gangrenous symptoms and convulsions). In the past, importance was attached to this disease as a result of eating infected rye grains. Seeds with mycelium growth media and to clean the grains before milling. Most of the data for mycotoxins is on the genus Aspergillus spp and the alatoxins it produces during its growth. They are the most common and most toxic mycotoxins, such as aflatoxin B, which is the strongest known carcinogen. In fights on rats, it was found that its carcinogenic effect appears in a daily dose of 10 mcg

/ kg of weight. In a comparative study, it was found that the carcinogenic property of a highly toxic compound, dimethylnitrosoamine, appears at a daily dose of 750 mcg/kg body weight. The foods that are the first to be contaminated with aflatoxins are plant materials (especially nuts and fruits). Aflatoxins pass from stale feed to animal products, primarily milk. Metabolism in dairy cows converts group B, from aflatoxins to group M (M refers to metabolites), which is also carcinogenic. In the food control program that took place between 1995 and 2002, more than 40 foods were tested for the presence of aflatoxins, deoxynivalinol, fumosin, patulin, and ozeralinone. Mycotoxins were found in 21% of the samples, and pistachios were the most affected. Evaluation of health risks arising from mycotoxins becomes useless when applied to aflatoxins because these substances destroy DNA and are carcinogenic, and a threshold below which they do not have a harmful effect has not been observed. But evaluation is possible in the case of Doxynivalinol, with reservations assuming that there are specific, if temporary, reference values [26-30]. The reason for reservation is due to the fact that the data provided for the correct assessment of its effects on human health is still quite limited. Food intake must be known in order to calculate how to use reference values. To achieve this purpose, a large national study was conducted to know the consumption in the Federal Germany between 1985 and 1988, and by looking at the preferred foods, the amount of consumption and the average body weight of the individuals who underwent the test were known. In it, the individuals subject to the test were divided, in order to differentiate in the presentation of the results, the individuals were divided into 10 different groups in age, gender and consumption groups, that is, into children, men, women. In the case of deoxynivalinol, the use of reference values is relatively high, at a level of 34.1-82.5%. The highest value was calculated for children 4-6 years old and the lowest value for women (intake of fish). Cereal products are majorly contaminated with oxynephalinol. Most children eat or eat kratoxin, and in addition to cereal products, fruit juices are a source of these substances. When comparing the UV/HPLC method for the analysis of patulin from mycotoxins, the detection limit was decreased by a factor of 100 if isotope extension assay with patulin was used as an internal standard. It was found in teff juice [31-33].

Harmful substances from thermal processes

Polycyclic Aromatic Hydrocarbons (PAHs)

The burning of organic materials such as wood (wood smoke and its semi-dry distillation, vapor phase wood smoke) and coal or fuel oil produces thermal decomposition reactions that produce a large number of PAHs (about 250 distinguished) with more than three straight molten benzene rings Or italics, which are all jargon to different degrees. The quantity and variety of these compounds generated is generally affected by the conditions in which the combustion takes place. Benzo (a) pyrene (BaP) is used as the guide compound. Food contamination with corrosive polycyclic compounds from the air (as usually occurs with fruit and leafy vegetables in industrial areas) or by direct drying of grains using combustion gases, or by smoking or direct barbecuing over charcoal, smoking sausage or fish, and coffee roasting). PAHs accumulate in high-lipid tissues. Its amount in meat and processed meat products should not exceed 1 μg/kg in the final product, measured on a BaP basis. BaP contamination has been reduced to this extent by using modern smoking techniques. A maximum of 5 μg/kg of BaP can be tolerated in smoked fish. Values of less than 1.6% μg/kg were found in 95% of samples tested in food control in 2005.

Furan

Furan is a potentially carcinogenic substance. It occurs in foods exposed to heat. Especially in roasted coffee. Analysis using dilution and isotopes using [H]-furan as internal standard gave 2.4-4.3 mg/kg in various products of coffee powders. Baby foods such as carrot puree, potato puree and spinach contain 74 and 75 mcg/kg thus. Furan is formed from amino acids that give acetyldehyde and glycol aldehyde by thermal degradation effect. It is followed by reaction steps involving aldol condensation, cyclization and dehydration. Among the precursors of the furan are also carbohydrates, unsaturated fatty acids, and carotenoids. The furan is formed by the thermal decomposition of ascorbic acid [34-36].

Acrylamide

D-polyacrylamide, which is produced from the monomer of acrylamide (propene amide) has been used for decades in various industrial processes, for example as a flocculant in drinking water treatment. Several toxicological studies have been done on acrylamide for occupational health and safety reasons. These studies have shown significant exposure (i) acrylamide joins hemoglobin in the blood. (ii) metabolizes to the active substance glacidamide epoxide and (iii) is carcinogenic upon chronic exposure in test animals. For these reasons, acrylamide was placed 20 years ago in the category 2A II carcinogen. According to the European Union guidelines for drinking water, the concentration of acrylamide should not be more than 0.1 μg/L. It has been known for a long time that there are relatively high concentrations of acrylamide in tobacco smoke, but in 2002 this compound was described for the

first time as an ingredient in various types of heat-treated foods, especially in processed potato products such as chips, and good bread and cakes contain relatively high concentrations. Today it is used for quantitative determination, mainly, stable isotope assay with GC-MS or LC-MS with the use of acrylamide labeled with deuterium or carbon. The difference in the concentration of acrylamide in foods within a wide range indicates that the raw materials and the conditions of the manufacturing procedures have a significant influential role on the formation of acrylamide. Thus, it can be said that the formation of acrylamide in potato products changed clearly depending on the potato types, and that the concentration of acrylamide decreased clearly when the heating temperature was reduced as in deep frying. Acrylamide is formed in detail by the reaction of the amino acid asparagine with the reduced carbohydrates (or their metabolites). In fact, studies with isotope-tagged asparagine have indicated that the carbon structure of the amino acid in it is in acrylamide. Thus, the formation of acrylamide, as in the case of potatoes, occurs after heating for a while, and the concentration of glucose and fructose in fresh potatoes is better correlated than with the concentration of free aspartone gene, although potatoes have a very high concentration of free asparagine at a rate of 2-4 g / kg dry weight. In the case of gingerbread, in addition to the concentration of the artisanal asparagin, what was used as an expert powder was distinguished as a promoter of acrylamide formation. Among the ways in which the concentration of acrylamide in food can be reduced, in addition to the enzymatic hydrolysis of aspargine with aspargenase, is the use of various additives, lowering the pH number, and lowering the temperature [37-40].

Nitrate, nitrite Nitrate, nitrite

Plants of group a can store much more nitrate than those of group B, since the amount of nitrate in them depends, among other things, on the amount of nitrogen fertilizer used for their growth. Even light plays a role because some plants store more nitrates when they lose light, in addition to the properties of the soil. One of the sources of nitrates for humans is animal food and drinking water. It was calculated from the National Consumption Study that nitrate intakes were high in children from 64 years of age. It is followed by women and men who prefer fruits and vegetables in their meals rather than meat and fish. It was found that the acceptable daily dose of nitrate is used by 23-40% of the population. It is worth noting that the amount of nitrates formed every day in the human body is about 1 mg / kg of body weight, which is completely equivalent to its food intake. The precursor of nitrate in humans is arginine, which is cleaved to give NO and sterolin. NO is oxidized to, N2O3, which reacts with water and gives nitrate. Hemoglobin oxidizes nitrite to nitrate, giving rise to meth.

Effect of Fluorosis

Poisoning occurs when a person is exposed to multiple sources of fluorine, whether in food, drink or air, but water is the main source of poisoning, especially water that resides in the slopes of mountains or at seas consisting of a high percentage of fluorine in addition to water pollution, fires, And explosions result in human exposure to high levels of fluorine. The first and most common degree of fluorine poisoning occurs when moderate amounts of fluorine are ingested and results in teeth pitting and discoloration. In severe cases, enamel may be damaged. The second degree of fluorosis occurs when a large amount of fluorine is ingested for long periods. The fluorine accumulates in the bone gradually and does not appear suddenly. At first, some initial symptoms appear which are stiffness and pain in the joints. In severe cases, the structure of the bones is affected and changed, the ligaments calcify, which results in a feeling of pain in the muscles. The third and most serious degree of fluorine poisoning occurs when acute exposure to a very large proportion of fluorine, but it is considered a rare case, and results in immediate effects [41].

Arsenic Poisoning

Crystal Clear app kdict.png Main article: Arsenic poisoning., Arsenic is used in industry as dyes, glass, paper, textiles, leather tanning, pesticides and tobacco. Arsenic is one of the components of the earth's crust, in addition to being widely distributed in all elements of the environment (air - soil - water), and the inorganic form of it is considered the most harmful. The percentage of inorganic arsenic in groundwater is high in many countries such as (Argentina - China - India - Bangladesh - Chile - Mexico - the United States), and that polluted water is used for many purposes such as: drinking, irrigation of agricultural crops and food preparation.

Symptoms of lead poisoning

Children are considered the most vulnerable group to lead cancer, because the body of children absorbs a certain source of lead at a rate that exceeds the absorption of adults by four or five times, and children who suffer from malnutrition and lack of calcium or other elements are most vulnerable to lead poisoning. Exposure to high levels of lead results in: coma, convulsions, mental retardation.

Effects of alcohol poisoning

Alcohol is considered a psychoactive substance, and its abuse results in much health, social and economic effects that negatively affect

society. Alcohol causes 5.9% of deaths around the world, and results in more than 200 diseases, and its drinking is associated with many disorders. Psychological and behavioral, including alcohol dependence, in addition to the fact that alcohol is the main cause of many traffic accidents, violence, and increased suicide rates [42].

Effects of Nicotine Poisoning

Nicotine is a semi-alkaline organic compound found in the coca plant and other crops such as tomatoes, potatoes, eggplants and green peppers, but in small quantities. It is also used in the tobacco industry and various types of cigarettes and is used in the manufacture of pesticides. Nicotine is the chemical that causes cigarette addiction and makes it difficult to quit, and nicotine has been shown to have a negative effect on all parts of the body. Inhalation is the main cause of nicotine poisoning, followed by contact, which occurs when the body comes into contact with any insecticide containing nicotine, even if it is by mistake. Mostly, acute nicotine poisoning occurs to non-smokers, due to the inability of their bodies to fight the poison emitted by cigarettes. As for chronic poisoning, it affects heavy smokers, and it occurs when approximately 40-80 milligrams of nicotine are inhaled at one time, and that dose can be considered fatal.

Mercury Poisoning

Mercury poisoning comes from eating organic mercury compounds such as dimethyl mercury (CH3, -Hg - CH3), methylmercury salts, and pentylmercury salts. Some of them use fungicides and to treat seeds (spraying seeds). Methylmercury compounds are made from deposits of inorganic mercury salts found at the bottom of lakes and rivers. Thus, the amount of these compounds is likely to increase in fish and other organisms that live in water. The level of natural mercury in the environment appears to have stabilized over the past 50 years. Records of mercury poisoning in Japan indicate that it was caused by the consumption of fish caught from waters heavily contaminated with industrial waste water containing mercury, and that the cause of poisoning in Iraq was due to the consumption of mercury-rich grain seed flour for use in agriculture. The dose that an adult 70 kg can carry is 0.35 mg Hg per week, of which a maximum of 0.2 mg is the highly toxic methylmercury. It gives an average intake of food, mostly fish consumption [43].

Botulism in Children

Muscle weakness due to botulism begins characteristically in the muscles supplied by the cranial nerves. There is a group of twelve nerves that control the movements of the eyes, the muscles of the face, and the muscles responsible for chewing and swallowing. Hence, double vision may occur, drooping eyelids, loss of facial expressions, problems swallowing, as well as difficulty speaking. The weakness then extends to the arms (from the shoulders to the forearms) and the legs (again from the thighs to the feet). Severe botulism leads to decreased respiratory muscle movement, hence gas exchange problems.

The sufferer feels these symptoms in the form of shortness of breath (difficulty breathing), but in severe cases it may lead to respiratory arrest, due to the increase in carbon dioxide in exhalation and its resulting inactive effect on the brain. This can lead to coma and eventually death if not treated. In addition to affecting voluntary muscles, it can also lead to dysautonomia. This may be felt as dry mouth (due to decreased salivation), orthostatic hypotension (low blood pressure on standing, with light-headedness and risk of unconsciousness), and eventual constipation (due to decreased peristalsis). Some types of toxins (B and E) also cause nausea and vomiting. Physicians often think of botulism symptoms in terms of the classic triad: thyrotoxicosis, descending paralysis, loss of activity, and cognition and a clear mental state ("clear sensory"). First discovered in 1976, childhood botulism is the most common form of botulism in the United States. There are about 80 to 100 cases of pediatric botulism diagnosed in the United States annually. Babies are more susceptible to botulism in the first year of life, and 90% of cases occur in children younger than six months. Botulism in children results from the ingestion of Clostridium botulinum spores and subsequent colonization of the small intestine. A child's intestines may be colonized when the composition of the intestinal flora is insufficient to competitively inhibit Clostridium botulinum growth, and the level of bile (which normally inhibits the growth of clostridia) is lower than later in life. Bacterial growth leads to the release of Botox, which is absorbed into the circulatory system and throughout the body, causing paralysis by blocking the release of acetylcholine at the neuromuscular junction. Classic symptoms of botulism in children include constipation, fatigue, weakness, difficulty eating, and altered crying, often progressing to complete flaccid paralysis. Although constipation is usually the first symptom of botulism in children, it is often overlooked. Honey is the only known nutritional repertoire of Clostridium botulinum spores associated with food poisoning in children. For this reason, honey should not be given to children under one year of age. There are other cases of food poisoning in children that are believed to have picked up the germs from the natural environment. Clostridium botulinum is a ubiquitous bacteria found in soil. It turns out that many children

with botulism live near construction sites or areas with disturbed soil , The toxin enters the human body in one of three ways: by bacteria colonizing the digestive system of children (child botulism), or adults (intestinal septicemia), by contaminating food with the toxin (foodborne botulism), or by contaminating a wound with bacteria (Wound poisoning). The transmission of botulism from one person to another does not occur. All cases lead to paralysis that usually begins in the facial muscles and then spreads to the extremities. In severe cases, it paralyzes the breathing muscles and causes respiratory arrest. In light of these life-threatening complications, suspected cases of botulism are treated as a medical emergency, and public health officials usually intervene to prevent further cases of the same source. Botulism can be prevented by killing the germs by cooking in a pressure cooker or using a sterilizer at 121 °C (250 °F) for 30 minutes, or by providing an atmosphere that prevents the reproduction of germs. Precautions to be taken to protect children include not giving them honey [41-43].

Diagnosis and Treatment

Diagnosis is through laboratory analysis of food, wound or stool and is often mistaken for Guillain-Barré syndrome (myasthenia gravis). Treatment: Giving the patient an antitoxin, which is an effective solution to overcome the danger situation and reduce mortality. In severe cases, the patient needs supportive treatment, especially intensive respiratory care and mechanical ventilation. In the case of wound botulism, an antibiotic should be given to the patient. Indeed, a vaccine against botulism has been found, but its effectiveness has not been proven significantly, and it has many side effects.

Prevention Treatment

Most poisons and drugs do not have specific antigens (contrary to popular perception from television and movies), but some do. Some common drugs that may need specific antipoisonings include acetaminophen (the antagonist is N-acetylcysteine), aspirin (the antagonist is sodium bicarbonate), and heroin (the antagonist is naloxone). There are also antidotes for some poisonous bites and stings (snake bites). It is not necessary to use the antidote for everyone who has been poisoned. Many people recover on their own. But in severe poisoning, the antibiotic may be lifesaving. Poisoning often needs treatment, called supportive care, to stabilize the heart, blood pressure, and breathing until the poison is gone or inactivated. For example, a person who has become very drowsy or in a coma may need to have a breathing tube inserted into the windpipe. The tube is then connected to a ventilator that supports the person's breathing. The tube prevents vomit from entering the lungs, and the ventilator ensures that adequate breathing occurs. Medication may also be necessary to control seizures, fever, and vomiting. If the poison causes a high temperature, it may be necessary to cool the person, such as with a cooling blanket or sometimes by applying cold water or ice to the skin.

Hemodialysis is necessary if the kidneys stop working. If the damage to the liver is extensive, treatment for liver failure may be necessary. If severe damage to the liver or kidneys is persistent, a liver transplant or a kidney transplant may be necessary [44].

Preventing poison absorption. It was common practice to empty the stomach (inducing vomiting or emptying the stomach) but is now avoided because it removes only a small amount of the toxin and can cause serious complications. Gastric emptying rarely improves the affected person's prognosis. However, gastric pumping may be done on rare occasions when a very serious poison is present, or if the person appears to be very unwell. For this procedure, a tube is inserted through the mouth or nose into the stomach. The water is then poured into the stomach through the tube and then drained (gastric lavage). This procedure is repeated several times. If people are sleepy due to the poison, doctors usually first place a plastic breathing tube through the mouth into the windpipe (endotracheal intubation). Endotracheal intubation helps prevent gastric lavage fluid from entering the lungs. In the hospital, doctors do not give ipecac to empty the stomach, because its effects vary.

Activated charcoal is sometimes used in hospital emergency departments for people who have swallowed toxins. Activated charcoal binds to the poison still in the digestive system, preventing it from being absorbed into the blood. Oral charcoal is usually given if the person is cooperative. It is not recommended to insert a tube through the nose or mouth for the purpose of administering activated charcoal to an uncooperative or disturbed person. Doctors sometimes give charcoal every 4-6 hours to help cleanse the body of toxins. Charcoal does not deactivate all toxins. For example, charcoal is not associated with alcohol, iron, or many household chemicals. Also Food contamination can occur at any stage of production: cultivation, harvesting, processing, storage, shipping or preparation. Cross-contamination - the transfer of harmful organisms from one surface to another - is often to blame. This is especially troublesome for ready-to-eat raw foods, such as salads or other vegetables and fruits. Because these foods are not cooked, harmful organisms are not eliminated before eating and

these organisms can cause food poisoning. Many bacterial, viral, or parasitic agents cause food poisoning. The following table shows some of the potential contaminants, the possible times when symptoms start and the common ways organisms spread [45, 46].

CONCLUSIONS

Toxins can be measured by tracking their effects on a target (be it an organism, system, tissue or cell), because individuals usually have different levels of response to the same dose of a toxin, but community and population scales of toxicity can also be used to estimate the likelihood An individual in the community is exposed to potential complications if he takes a certain dose of poison, and an example of this is the use of the median lethal dose to estimate the toxicity of substances, which is the dose needed to kill half of the sample members. Accurate data A comparison is made for similar known poisonous objects. For example, if a dose of a toxin is safe for a laboratory rat, one can assume that one-tenth of that dose is safe for humans, allowing a safety factor of 10 to be in place due to the difference in species. If the data are from fish, then one can use a safety factor of 100 for differences between fish and mammals (two different classes of chordates), and similarly, a high safety factor can be used for individuals believed to be more susceptible to the effects of fish.

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