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## HOW DO TOXIC SUBSTANCES AFFECT YOU?

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**The aim of the research.** To study the negative influence on the metabolism of toxic substances. Neutralization of toxins in the human body at the present stage of protection of people in Ukraine.

**Object and subject of research.** The object is the effect of toxic substances on the human body.

The subject of the study is the neutralization of the influence of toxic substances on metabolism.

**Methods and means of research.** Use of theoretical and methodological foundations for evaluation and analysis of the influence of toxic substances on the health of Ukrainians.

**Relevance of the research.** Negative influence on metabolism of toxic substances in Ukraine.

**Scientific novelty and practical value of the results.** We will know how to avoid the negative effects of toxic substances on the human body. We learn the causes of some diseases, and therefore we will be able to get successful treatment. An urgent need for the study and development of health care from the harmful effects of toxic substances arose with the decline in the level of ecology around the world. People do not care about their future. They pollute the world with harmful substances, waste and gases.

**Research results.** Toxic substances that cause poisoning of the entire human body or affect individual systems of the human body.

Toxic substances can be of exogenous origin in particular toxins of animals, plants, fungi and chemical substances of anthropogenic origin - heavy metal salts, petroleum products, freons, pesticides, detergents, perfumery, medicines, food supplements, etc. Also, toxic substances of endogenous origin can act on the body, which are formed as a result of metabolic processes in the human body, in particular ammonia [1].

Toxicity of a substance is determined by a number of factors: the ability and ways of penetration into the human body, the nature of the effect on various organs, the dose necessary to cause its effect, etc. The effect of a toxic substance is influenced by the age of a person, his sex, body weight, as well as the diet and the presence of diseases [1].

The main ways of penetration of toxic substances in the body are respiratory tract, skin, digestive organs. The most important of these are respiratory tract. When conducting the examination of the respiratory tract, the toxic substances enter the blood that passes the pectin, which performs the role of the mechanical and biochemical barrier in the body. Toxic substances that are readily soluble in veins and in the blood, easily penetrate the body through the skin. These toxic substances include gasoline, benzene, kerosene and others [3].

Xenobiotics - alien substances that are not synthesized in the human body, but entering in the body or on the skin, can cause allergic reactions, mutations, diseases, weaken immunity, disrupt metabolism, etc [2].

Xenobiotics include: dioxins, medicines, drugs, pesticides, mineral fertilizers, detergents, radionuclides, synthetic dyes, and others.

Dioxins - is a group of chlorinated hydrocarbons with a powerful toxic effect on the body. The most dangerous sources of dioxins are enterprises with chlorinated technological processes (chemical, pulp and paper, metallurgical), waste incinerators and landfills of chemical wastes. Dioxins are well soluble in fats and get into the body mainly from meat, fish and milk.

Pesticides are chemicals usually are used to control pests and protect plants. Particularly dangerous are organochlorine pesticides (hexachloranum, polychloroprene) organophosphorus



insecticides (dihlorvos, carbophos, trichlorfon), organ-based substances (granosan) [2]. All pesticides have a negative influence on humans and nature.

Nitrates are thermally unstable, water-soluble compounds that can accumulate in roots and the fruits of plants [2]. The nitrates are not poisonous, but in the human body they are converted into nitrites that interact with hemoglobin in the blood. In the body, tissue respiration is disturbed, resulting in a disease of methemoglobinemia. In addition, the effect of nitrites is dangerous to the body because formed carcinogens - nitrosamines.

Psychoactive substances - which cause habituation if patient use these medicine systematically. As a result, the behaviour of a person is changed.

The influence of alcohol on the processes of metabolism in the human body, on the structure of cells consists of the action of two substances - ethyl alcohol and derivative acetaldehyde, which destroy of metabolism.

The most important of these are membrane damage, disturbance of oxidative-reduction reactions, lack of nutrients, decrease of protein synthesis, violation of mechanisms of regulation of body functions. An increase in the amount of ethanol in the body leads to a metabolic dependence on it.

There are many harmful compounds in tobacco smoke (carbon monoxide, enkephalins, formaldehyde, acetaldehyde, benzene, etc.), but the most dangerous is nicotine. It is an alkaloid that has a poisonous effect in the body.

Drugs are substances that cause addiction. Due to substitution substances of metabolism. Drug dependence is formed during drug use. Narcotic substances are perceived by the body as endorphins and enkephalins.

### Conclusions

Biotransformation – is neutralization of toxic substances by converting them into a molecular form with altered biological properties and excretion from the body.

In the human body, the elimination of dangerous compounds is carried out by the liver with the participation of special enzymes and membrane receptors that regulate their activity. Toxic substances are removed from the body with urine or bile .

Biotransformation of xenobiotics occurs in two phases:

- Phase 1: modification is the oxidative-reduction and hydrolytic reactions are catalyzed by ENP enzymes (cytochrome P450, epoxide hydratases). The xenobiotic molecule is enriched with functional groups (-OH, -COOH, -SH, -NH<sub>2</sub>), which makes it soluble in water.

- Phase 2: conjugation – are synthesis reactions which are involving enzymes-transferases. Endogenous molecules (glucuronic acid, sulphate acid and glutamine) are joined to intermediate metabolic products [2].

It is now established that the processes of biotransformation of foreign substances occur in the liver, the gastrointestinal tract, lungs, kidneys.

Resulting in the formation – are compounds for removal from the human body.

**Keywords.** Toxic substances, xenobiotics, dioxins, psychoactive substances, biotransformation.

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