ANTIDOTES IS IMPORTANT CHEMICAL SUBSTANCES

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Abstract. This article describes antidotes that are important in medicine and their classification.

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In old medicine, many diseases were considered as poisonings, and therefore drugs effective against them were called antidotes. Poison was usually understood as everything that causes diseases, including infections unknown at that time. Ideas about the mechanisms of action of poisons up to the end of the 18th century also differed from modern ones. Poisoning was considered as the result of mechanical damage to organs by invisible particles of poison. The idea that there are substances that have an invisible sharpness that injures a living body was later “reinforced” by the fact that when microscopy of various salts, crystals shaped like swords, spears, etc. were found. Such ideas prompted the use of substances as antidotes that could soften the poisonous pungency. That is why doctors so often prescribed emollients - fats and mucus for poisoning, for example, with arsenic. Such antidotes were credited with the ability to have not only a local, but also a favorable effect during resorption. Another common view of poisoning was based on the humoral theory of pathology. In the classification of poisons proposed by Galen, groups of cooling, warming, putrefactive poisons were distinguished, and antidotes against them were considered substances that, according to the views of the humoralistic theory, could restore the balance of qualities disturbed in the body: warm versus cold (beaver stream - a warm remedy - against opium - cold agent).

There was an idea that the antidote should expel the poison from the body, since the disturbance of health is caused by some disease-producing matter to be

removed. This idea is associated with the widespread use of drugs that cause vomiting, sweating, salivation. Bloodletting has been the most important therapeutic measure for many centuries.

Mention should be made of antidotes, to which fabulous powers have been attributed for centuries. These were considered the famous theriaci - antidotes of the Middle Ages and the Renaissance. The theriac contained numerous components (up to 200) of the most incredible nature. The method of their preparation was kept secret and required a long time, since the potion had to be “infused”.

The modern history of antidotes began in the 19th century, when, with the development of chemistry and the introduction of experiment into the practice of medical research, the development of these drugs took on a scientific basis.

In fact, any antidote is a chemical substance intended to be administered before, at the time or after the toxicant enters the body, that is, a coergist, the obligatory property of which should be antagonism to the poison. Antagonism is never absolute and its severity essentially depends on the sequence of administration of substances, their doses, and the time between injections. Very often, antagonism is one-sided in nature: one of the compounds weakens the effect on the body of the other, but not vice versa. Thus, reversible cholinesterase inhibitors, when administered prophylactically, weaken the action of organophosphorus substances, but organophosphorus substances are not antagonists of reversible inhibitors. In this regard, antidotes are introduced into practice after careful selection of the optimal timing and doses of administration based on a deep study of the toxicokinetics of poisons and the mechanisms of their toxic action.

Currently, antidotes have been developed for only a limited group of toxicants. According to the type of antagonism to the toxicant, they can be classified into several groups.

Usually, the following mechanisms of antagonistic relations of two chemicals are distinguished:

Chemical, biochemical, physiological, based on the modification of xenobiotic metabolism processes.

Antidotes with chemical antagonism bind directly to toxicants. In this case, the freely circulating poison is neutralized. (EDTA, unithiol, amyl nitrite, diethylaminophenol, antibodies and Fab fragments).

Biochemical antagonists displace the toxicant from its association with target biomolecules and restore the normal course of biochemical processes in the body. (oxygen, pyridoxine, methylene blue).

Physiological antidotes, as a rule, normalize the conduction of nerve impulses in synapses that have been attacked by toxicants. (atropine, aminostigmine, flumazenil, naloxone).

Metabolism modifiers prevent the conversion of the xenobiotic into highly toxic metabolites, or accelerate the biodetoxification of the substance. (Na thiosulfate, acetylcysteine, ethanol, 4-methylpyrazole).

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