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ECOLOGICAL FEATURES OF CONTRAST DYE USING IN X-RAY PATHOLOGY DIAGNOSTICS

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The paper shows the features of using contrast agents for various methods of x-ray studies by considering the causes of the main side effects of the use of these drugs through the prism of the physicochemical and immunological features of radiopaque agents, and providing the data on the occurrence of adverse reactions.

Keywords: radiocontrast agents, coronary angiography, urography, atopic reactions, chemotoxicity, side effects.

Currently, various radiological techniques are used to diagnose many diseases. The contribution of modern methods of radiation diagnosis to medical practice is very large. Diagnosis of most diseases is based on these methods of medical imaging. The most notable achievements in the field of radiation diagnostics over the past 10 years are the development of endo-vascular surgery and digital radiology. In many ways, approaches to the use of X-ray logical research methods using X-ray contrast agents have changed, taking into account the occurrence of adverse reactions and complications.

The density of the internal organs and tissues of a person is approximately the same, and during the X-ray examination is not always sufficient for their detailed reproduction. In order to visualize the internal structure of various organs, blood vessels, tissues, resort to artificial contrasting. In vascular surgery, the most common is the method of angiography of blood vessels. The method is based on the introduction of water-soluble contrast agents into the arterial (arteriography) or venous (venography) course. In gastroenterology, artificial contrasting is widely used to study various departments of the gastrointestinal tract, fluoroscopy of the esophagus, stomach, duodenum, colon – irrigoscopy, biliary tract – cholangiography. In pulmonology – bronchography is used, in uroscience – excretory and ascending pyelography and cystography, in osteology – arthrography and fistulography. Radiocontrast agents are divided into two groups: X-ray negative – transmitting X-rays (carbon dioxide, nitrogen, oxygen, xenon and other gases), and X-ray positive ones that hold them (iodine-substituted and not containing iodine).

For half a century, barium preparations (sulfate) have been used for contrasting the intestines, their main advantage is pharmacological inertness, however, it should be pointed that they are not acceptable for visualizing closed cavities and blood vessels. Organic iodine preparations, among which nonionic and ionic monomeric and dimeric iodine-containing substances are distinguished, are increasingly being used for the purposes of angiography, urography, cholecystography, myelography. According to the results of clinical studies of a number of authors, neutral drugs have greater safety and better tolerance. However, the highest complication rate, in 75% of cases, occurs with the intravenous route of administration of the drug. A characteristic feature of the pharmacokinetics of angi-uographic agents is their circulation in the vascular bed without any connection with proteins and a high rate of kidney excretion. Basing on the study of the mechanisms of contrast agents transporting and their interaction with plasma proteins, blood cells, and membrane structures of the liver and kidneys, the theory of drug organotropy was formulated.

Despite the recent emergence of new, less toxic drugs, the problem of the safety of their use remains very relevant. As a rule, all adverse reactions to intravascular administration of drugs occur in 12% of cases, and some of them require emergency resuscitation. All side effects are divided into chemotoxic and atopic (anaphylactoid and allergic). Atopic reactions are due to the release of histamine and other mediators. Chemotoxic effects are almost always present and are explained by osmotic activity, lipophilicity, which often leads to nephrotoxicity of the drug. When acting on the trigger zones of the brain, nausea and vomiting are possible. Complications often occur in people prone to allergic reactions with concomitant pathologies. Thus, we can conclude that with the correct use of contrast agents, the optimum dose taking into account the patient's allergostatus, it is possible to improve the diagnosis of diseases and significantly reduce the risk of side effects.

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