

Hypersensitivity Reactions Following Intravenous Administration of Contrast Medium

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Abstract : Hypersensitivity reactions are side effects of medications that resemble an allergic reaction. Anaphylaxis is a generalized, severe allergic reaction of the body caused by exposure to a specific agent at a dose tolerated by a healthy body. The most common causes of anaphylaxis are food (about 70%), Hymenoptera venoms (22%), and medications (7%), despite detailed diagnostics in 1% of people, the cause of the anaphylactic reaction was not indicated. Contrast media are anaphylactic agents of unknown mechanism. Hypersensitivity reactions can occur with both immunological and non-immunological mechanisms. Symptoms of anaphylaxis occur within a few seconds to several minutes after exposure to the allergen. Contrast agents are chemical compounds that make it possible to visualize or improve the visibility of anatomical structures. In the diagnosis of computed tomography, the preparations currently used are derivatives of the triiodide benzene ring. Pharmacokinetic and pharmacodynamic properties, i.e., their osmolality, viscosity, low chemotoxicity and high hydrophilicity, have an impact on better tolerance of the substance by the patient's body. In MRI diagnostics, macrocyclic gadolinium contrast agents are administered during examinations. The aim of this study is to present the results of the number and severity of anaphylactic reactions that occurred in patients in all age groups undergoing diagnostic imaging with intravenous administration of contrast agents. In non-ionic iodine CT and in macrocyclic gadolinium MRI. A retrospective assessment of the number of adverse reactions after contrast administration was carried out on the basis of data from the Department of Radiology of the University Clinical Center in Gdańsk, and it was assessed whether their different physicochemical properties had an impact on the incidence of acute complications. Adverse reactions are divided according to the severity of the patient's condition and the diagnostic method used in a given patient. Complications following the administration of a contrast medium in the form of acute anaphylaxis accounted for less than 0.5% of all diagnostic procedures performed with the use of a contrast agent. In the analysis period from January to December 2022, 34,053 CT scans and 15,279 MRI examinations with the use of contrast medium were performed. The total number of acute complications was 21, of which 17 were complications of iodine-based contrast agents and 5 of gadolinium preparations. The introduction of state-of-the-art contrast formulations was an important step toward improving the safety and tolerability of contrast agents used in imaging. Currently, contrast agents administered to patients are considered to be one of the best-tolerated preparations used in medicine. However, like any drug, they can be responsible for the occurrence of adverse reactions resulting from their toxic effects. The increase in the number of imaging tests performed with the use of contrast agents has a direct impact on the number of adverse events associated with their administration. However, despite the low risk of anaphylaxis, this risk should not be marginalized. The growing threat associated with the mass performance of radiological procedures with the use of contrast agents forces the knowledge of the rules of conduct in the event of symptoms of hypersensitivity to these preparations.

Keywords : anaphylactic, contrast medium, diagnostic, medical image

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