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CLINICAL PHARMACOLOGICAL APPROACH TO THE USE OF IMMUNOCORRECTORS IN IMMUNE INFLAMMATORY DISEASES

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Abstract:

The review presents the results of a comprehensive study of the main properties of the therapeutic molecule azoximer bromide (polyoxidonium). The experience of using the immunomodulator in acute respiratory infections is analyzed. Polyoxidonium has a pronounced immunomodulatory (including interferon-producing) activity, has a non-specific protective effect against a wide range of pathogens, based not on direct inhibition of microorganisms, but on the regulation of the immunity of the macroorganism. In addition, the drug has antitoxic and antioxidant properties. In the acute period of the disease, azoximer bromide is used in combination with etiotropic therapy, and during the rehabilitation period or for the purpose of immunoprophylaxis of respiratory infections - as monotherapy.

Keywords: respiratory infections, resistance, immunity, immunomodulators, immunotherapy, inflammation, polyoxidonium.

INTRODUCTION

The development and course of many pathological processes, including infectious and inflammatory ones, are accompanied by disturbances in the functioning of the body's immune system [1]. Increasingly, traditional etiotropic treatment of infectious diseases is complicated by the development of pathogen resistance to antimicrobial therapeutic agents [2]. In this regard, methods of therapy based on modulation of the immune response are increasingly used in clinical practice [3, 4].

MATERIALS AND METHODS

The modern strategy of immunomodulatory therapy is based on a large number of research results on various methods by which the immune system destroys foreign antigens (pathogens and allergens) constantly penetrating the body or tumor cells arising in it. For this purpose, it has a complex set of constantly interacting nonspecific (innate) and specific (acquired) mechanisms [5]. The main components of nonspecific immunity are phagocytes: neutrophils, monocytes (in the blood) and macrophages (in tissues), alveolar macrophages (in the lungs), Kupffer cells (in the sinuses of the liver), synovial cells (in the joint cavities), mesangial phagocytes (in the kidneys), etc. Their main function is to capture and digest microorganisms penetrating from the outside.

RESULTS AND DISCUSSION

Innate immunity factors also include complement proteins, acute phase proteins, and cytokines. Specific immunity is acquired as a result of the body's contact with an antigen, either "wild" (the causative agent of the disease) or "weakened" (included in vaccines), and is characterized by the formation of immunological memory. Its cellular carriers are lymphocytes, and its humoral carriers are immunoglobulins [2]. There is an opinion, supported by the results of experimental studies and clinical experience, that the development of effective and safe immunocorrection agents and methods of their use can radically change the tactical treatment regimens for patients. For example, the lack of effective control over many infectious diseases using etiotropic chemotherapy determines the relevance of the search for alternative approaches, in particular those based on the modulation of anti-infective immunity [4].

There are specific and non-specific, active and passive methods of immunomodulation. The goal of active specific immunotherapy is to form an adaptive immune response. A significant problem in the development of effective methods in this area is the requirement for the preservation of the patient's immune system (i.e. the absence of immunodeficiency). Non-specific immunotherapy is less selective than specific. Its goal is to activate the work of the entire immune system with the expectation of strengthening, including protection against a specific antigen (pathogen). The main disadvantages of this direction are, in addition to the requirement for the immune system, its ability to adequately respond to the stimulant, as well as the

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problem of possible "dispersion" of this response, which can lead to ineffective use of the resources of the immune system and its premature depletion [1]. Immunomodulators are drugs that, in therapeutic doses, restore impaired functions of the immune system [2], which are used for the following purposes:
- increasing the effectiveness of etiotropic anti-infective therapy;
- increasing the duration of remission and reducing the frequency of exacerbations (and hospitalizations) in chronic recurrent infectious and inflammatory diseases;
- preventing the development of infectious complications in individuals at risk of developing secondary immune deficiency;
- normalizing impaired parameters of the immune status if it can be monitored.

In clinical practice, 3 main groups of immunomodulators are used: exogenous, endogenous and chemically pure (synthetic). The exogenous group includes drugs of microbial or plant origin, nucleic acids, etc., and the endogenous group includes cytokines and immunoregulatory peptides. The group of immunomodulators of cytokine nature includes, for example, interferons, interleukins, colony-stimulating factor. Immunoregulatory peptides include drugs of thymic and bone marrow origin. One of the most effective and safe areas of clinical application is considered to be the use of chemically pure (synthetic) immunomodulators, among which low- and high-molecular compounds are distinguished [3].

All provisions in the medical literature on the principles of prescribing immunomodulatory therapy in clinical practice are only advisory in nature and require mandatory correction for each specific patient, taking into account many factors (age, diseases and their severity, features of the basic therapy of the underlying disease, etc.). When prescribing immunomodulators, the general principles of the concept of rational use of drugs are taken into account, according to which each patient has the right to pharmacotherapy adequate to his clinical condition; in doses corresponding to the individual characteristics of the patient; for the appropriate period of time and at the lowest price [4]. The necessary qualities of drug acceptability are proven efficacy and safety of the drug, the absence of addiction to it, the absence of side and carcinogenic effects, predictability of the metabolic pattern and route of elimination from the body, known compatibility with other drugs used in combination therapy [5]. Immunomodulators should not cause excessive sensitization and induction of immunopathological reactions, as well as potentiate them in other drugs [2]. The preferred quality is considered to be ease of delivery of the drug to the destination area and the possibility of enteral administration. The outstanding achievements of domestic medical science are well known not only in the development of the fundamental principles of immunotherapy [4], but also in the creation and implementation of original immunomodulators and new generation vaccines [3]. One of such domestic developments is the original molecule of azoximer bromide (polyoxidonium), obtained using targeted chemical synthesis, but close in its structure to substances of natural origin. Polyoxidonium is the main representative of the group of high-molecular synthetic immunomodulators [2].

Azoximer bromide belongs to the class of water-soluble derivatives of heterochain aliphatic polyamines. This class of compounds has no analogues in the world both in structure and in properties. The presence of a tertiary nitrogen atom in the main chain of the macromolecule opens up virtually unlimited possibilities for obtaining modifying agents with a wide range of physicochemical, physiological and pharmacological properties. Varying the chemical structure of the heterochain polyamine, as well as the chemical structure of the modifying agents and the degree of modification of the polyamine, makes it possible to regulate the above properties within wide limits [4].

CONCLUSION

Thus, azoximer bromide (polyoxidonium), which has a multifactorial effect due to not only immunomodulatory (including interferon-inducing), but also detoxifying and antioxidant effects, can be classified as a drug of choice in the acute period of RI if it is prescribed simultaneously with etiotropic therapy. The drug has been well studied, its high efficiency and safety have been proven, the duration of the course of administration is optimal. For rehabilitation and prevention of infectious diseases, the drug can be used as monotherapy. Positive results have been achieved with sublingual and intranasal use of the immunomodulator, which expands our understanding of the possibilities of regulating local immunity and allows using the drug for pre-season prevention of ARI in children and adults.

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