SOME IMPORTANT MODERN PROBLEMS OF CLINICAL MICROBIOLOGY AND IMMUNOLOGY

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INTRODUCTION

At present there is no doubt that there is a high risk of development, a change in the spectrum, pathogenesis and etiology, clinical course, laboratory diagnosis, treatment and prevention of infectious diseases (Zemskov et al., 2017). Naturally, representatives of the micro world are evolving in the same way as other species of animals. Over the past 20-30 years, more than 30 new and modified microorganisms have been discovered, which are combined into a group of “emergency” infections that are dangerous to humans. In this sense, the viruses of HIV, hemorrhagic fevers of Marburg, Lass, Ebola, pathogenic bacteria and viruses causing atypical pneumonia, legionnaires’ disease, Lyme fever are discovered. Also several “traditional” microorganisms acquired pathogenic properties and became dangerous for humans. These include helicobacter, causing gastric ulcer and 12-duodenal ulcer, monkeypox virus, etc. Parenteral hepatitis, tuberculosis, chlamydia, chronic fatigue syndrome viruses have become epidemic. The frequency of infection of the female genitalia with mycoplasmas, chlamydia, gardnerella, and other intracellular parasites has increased. Due to the global vaccination, smallpox, prickly heat, and other infections have wholly disappeared.
However, all this has disturbed the balance of microorganisms that have developed over hundreds of millions of years, which naturally has unpredictable consequences for humanity, plants and animals.

An example would be the increasing role of T-cell leukemia viruses, hepatitis, oncoviruses, prions are pathogens of cowpox, modified influenza viruses in human pathology. Another actual problem of modern microbiology is infectious diseases affecting patients in medical institutions. Diseases of “presence” (nosocomial infections) are divided as a result of patients receiving medical care [iatrogenic lesions] (Zemskov et al., 2018a). Accordingly, hospital and outpatient infections and infections caused by preventive examinations are shared.

The etiological agents of nosocomial infections are pathogenic, opportunistic pathogens, parasitic saprophytes, inhabitants of various bio-tops of the human body, free-living microorganisms. In the case of carrying the infection, the exogenous to the endogenous strain of the pathogen exchanges rather quickly.

The clinical picture of nosocomial infections is usually atypical or erased, often does not correspond to the classic symptoms of community-acquired diseases. Clinical determinations are localization of the process, amount and virulence of the causative microorganism. Primary symptoms are characterized by a sudden rapidity, especially in patients from hospitals concerning outpatient clinics. Most often, patients are determined by fever.

All these patterns have led to a negative epidemic outlook for the 21st century, which is determined by a number of positions - (1) the appearance of absolutely “new” ones is not excluded infectious agents (Ebola, HIV, infections caused by the hepatitis C virus, etc.), atypical pneumonia, (2) activation or "return of old" infections is possible. Thus, in Japan, pertussis vaccination was discontinued, which caused an epidemic of this infection. As a result of the reduction of vaccination companies in 2000, a polio outbreak occurred in Chechnya. In Hungary and Colombia - measles. The migration of known (controlled) pathogens to new territories is expanding. In 1999, 4,000 people were infected with West African Nile virus in the United States by migrants from Africa.

Therefore, it is necessary (1) to modify the vaccination strategy in the new epidemic conditions, paying attention to the prevention of the return of “old” infections due to mass vaccination of children even in the absence of morbidity, (2) to develop vaccines against “new path-
ogens” based on the global early detection of non-known infectious pathogens using genetic engineering technologies, (3) theoretically and practically justify the use of immunomodulators and monoclonal antibodies for the earliest prevention of "new" infections, etc.

As known, the main functions of the body's immune system are carried out alternatively using “protective” and “pathogenic” potentials (Zemskov et al., 2018b). On the one hand (1) protection against external aggression, control of multicellular composition, morphological constancy, sclerosis, (2) clearance of the internal environment from biologically active and often “aggressive” molecules, (3) regulation of tissue homeostasis with the help of local systemic inflammation, regeneration, repair, tissue remodeling, (4) anti-infectious resistance, (5) elimination of mutant, cancerous, functionally defective and infected cells, (6) fertilization is realized through the interaction of fertilisin and antifertilisin gametes (7) carried by the fetus the anatomical improvement rudimentary organs (8) is induced due to childbirth block immune tolerance during pregnancy (9) is reproduced private regulation system disorders.

On the other hand, (1) the immune system “realizes” the mechanism of “immune aging of the organism” through the involution of the thymus gland, (2) with excessive suppression of immune responses, it performs the processes of primary and secondary immunodeficiency states, (3) in malignant and lymphoproliferative conditions, corresponding changes in homeostasis, (4) in case of over-activation of immune reactions - "causes” primary and secondary (pseudo)allergic, auto-aggressive and immune-complex diseases, (5) in imbalance of stimulating and suppressor processes contributes to the development immune-associated manifestations, in which they play not a nosological, but an auxiliary role.

The progress of medicine at the present stage is characterized by the establishment of new phenomena and patterns that sometimes do not fit into traditional theoretical and practical ideas, bypassing, for example, the ability of the brain to regulate blood glucose, bypassing the insulin mechanism, or the fact that myocardial cells form antigen-recognizing structures, (6) the formation of complex diseases, for example, "metabolic" syndrome, manifested in abdominal obesity, diabetes mellitus, arterial hypertension and dyslipidemia, and all this leads to the creation of new ways of directed regulation of pathological processes, for example, allergic through the system of leukotrienes, autoimmune - through endocrine factors. It should also be noted that there is certain conventionality of the basic fundamental immune phenomena, which include specific, nonspecific, cellular, humoral, phagoectytic, cytokine, etc (Zemskov et al., 2018c). It is extremely important to formulate the phenomenon of "metabol-
ic" immunity (for the first time we also took a certain part in distinguishing it in a separate category- Zemskov et al., 2018d) as a combination of protein, lipid, carbohydrate, water-salt exchanges, free-radical oxidation of lipids and proteins, antioxidant systems, enzymes, vitamins, repair, cytochrome with the immunoregulatory effects, the special role of low-molecular weight nucleic acid [in this area we also belong to one of the first publications (Zemskov V. M. and Zemskov A.M., 1992; Zemskov et al., 2018c)], is a key element of various types of metabolism, cell proliferation regulators, including the differentiation of immune cells, and alternative regulation of immune responses, including the modification of such enzymatic and non-genetic processes in microbial populations. We have shown for the first time that these drugs can neutralize the toxicity of cytostatics, antibiotics, bacterial exotoxins and endotoxins (Zemskov V. M. and Zemskov A.M., 1992). All this is a prerequisite for creating a modern concept of regulation of immune homeostasis and the development of new principles for the treatment of a wide range of diseases (Zemskov V. and Zemskov A., 2016).

REFERENCES