A bacteriological examination of the vaginal contents in women with BV was carried out after the complex therapy of bacterial vaginosis. The repeated bacteriological inoculation did not give rise to the growth of previously identified opportunistic microorganisms, and a tendency to the resumption of normobiocenosis due to the intensification of colonization by lactic acid bacteria, which was completely absent in most cases before the start of therapy, was observed to grow Lactobacillus spp. to 4 ± 0.02 lg CFU / g, the degree of colonization by fungi of the genus Candida decreased to 2.1 ± 0.03 g CFU / g.

Thus, recent studies show that BV not only reduces the quality of a woman's life, but is also associated with a number of inflammatory diseases of the genitourinary tract and is one of the most common causes of pregnancy complications. The disease often takes on a recurrent form due to the presence of biofilms, which may be the reason for the lack of effect of BV treatment when using various methods. Anti-virulence complex therapy by the method of low-frequency ultrasonic cavitation can be an alternative to treatment regimens for antibacterial therapy and be used in conditions of identified antibiotic resistance.

ANTIBIOTIC RESISTANCE: POSSIBLE WAYS TO OVERCOME

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The development of resistance in microorganisms is the main factor limiting the effectiveness of antibacterial drugs. In this regard, it becomes urgent to search for new ways to prevent the formation of resistance of pathogens of bacterial infections. One of the ways to overcome antibiotic resistance is the invention of combined drugs, which are called protected. Their use is justified in relation to bacteria that produce enzymes that decompose conventional antibiotics. Protection of popular antibiotics is carried out by the inclusion of special agents (for example, enzyme inhibitors) in the composition of the new drug, which block their production by bacteria or prevent the drug from being excreted from the cell by means of a membrane pump.

One of the possible ways to overcome the drug resistance of microorganisms is the chemical transformation of molecules of antimicrobial substances to obtain new drugs that are active against antibiotic-resistant microorganisms. In particular, by this transformation, semisynthetic penicillins and cephalosporins, insensitive to the action of β-lactamases, methicillin, oxacillin, dicloxacillin, cefamandol, cefuroxime, cefsulodin and a number of others were synthesized.

The bacterial metagenome contains genes that mediate resistance mechanisms and make it possible to inactivate almost any antibiotic. During some time after the start of the use of the new drug, the spread of the determinants of resistance to this compound by means of plasmids and transposons is noted. As a result, the effectiveness of the antibiotic begins to decline, which necessitates the development of new antimicrobial drugs. The use of compounds that suppress certain mechanisms

of resistance in a bacterial cell can be attributed to promising methods for combating resistant microorganisms.

The greatest progress in this direction has been achieved as a result of the use of β-lactamase inhibitors, the first representative of which was clavulanic acid. It has weak antibacterial activity and is not used as an antibacterial agent. However, the ability to irreversibly inhibit penicillinases of gram-positive and gram-negative microorganisms determines its use in combined antimicrobial drugs. The use of combinations of various antimicrobial agents is also a promising approach to effectively combat infectious agents. Thus, the use of novobiocin with tetracycline avoids the rapid acquisition of resistance to it by Staphylococcus aureus. The use of isoniazid with streptomycin prevents the development of antibiotic-resistant strains of mycobacterium tuberculosis. Methicillin and benzylpenicillin prevent the rapid development of fusidin resistance in staphylococci.

The use of antimicrobial drugs can be complicated by the formation of microbial associations that have a complex structure and hinder the access of drug molecules to bacterial cells. One of the common examples of such associations are biofilms that form at the interfaces between solid and liquid media, including mucous membranes in the body of animals. Biofilms can be formed by populations of a single bacterial species or by a community of many types of microorganisms. Modern microscopic methods have shown that biofilms have a complex architecture: bacteria in it are enclosed in an exopolymer matrix containing channels filled with liquid, through which the influx of nutrients and oxygen passes and the excretion of metabolic products.

A promising direction in the fight against antibiotic resistance can be the use of natural bacteriophages. Addiction and decreased sensitivity to bacteriophages is much less common than resistance to antibiotics, primarily because they are constantly evolving.

The discovery of antibiotics has significantly reduced mortality and morbidity in many infections that were previously considered intractable. In fact, in the absence of resistance, antibiotics are superior in effectiveness to any other antibacterial agent. However, the development of antibiotic resistance in many cases reduces their pharmacological value, which is aggravated by their side effects. At the same time, there is a wide range of antimicrobial agents of plant and animal origin, which can be used both individually and in combination with other drugs. Most of these funds have a number of advantages over synthetic drugs, such as multidimensional effects on the body, immunomodulatory effects, low toxicity, activation of the functions of the neuroendocrine system, stimulation of regeneration processes, weakening of stress factors, an increase in the immune response during vaccination, a decrease in the frequency of use of chemotherapeutic agents and an increase in their therapeutic effect. Various herbal remedies, antimicrobial peptides and other substances obtained from organs and tissues of animals, and their synthetic analogs, have considerable promise in this direction. Currently, a search is underway for herbal medicines (phytobiotics) that could replace synthetic antibiotics. It is known that many medicinal plants contain chemicals (flavonoids, terpenoids, essential oils, alcohols, resins, tannins, phenolic compounds, phytoncides, allicin, rafanin, chamazulene, etc.),

having antimicrobial activity. A number of them exhibit not only selective antimicrobial activity, but also together form a bactericidal effect. In recent years, numerous studies have been carried out on the medicinal properties of plants of wild-growing flora with antimicrobial, immunomodulatory and immunogenic properties. These plants contain not only well-known active substances with antibacterial action, but also some other compounds (lectins) that provide antimicrobial protection and preservation of homeostasis. Therefore, phytobiotics can replace synthetic antibiotics in animal feeding.

The most important direction in the fight against infectious diseases is to strengthen the immunological protection of farm animals. Work in this area is carried out in two directions: improvement of old and creation of new effective vaccines, as well as regulation of immunological reactivity using immunomodulators. In order to effectively use vaccination of farm animals in combination with immunocorrective drugs, it is very important to understand well how such vaccinations affect the immune status of the animal's body, which occurs with the T- and B-cell response. Despite the fact that more than 100 vaccines are already used in modern veterinary medicine and rather intensive research is being conducted in this direction, the task of effective immunoprophylaxis of infectious diseases remains one of the most pressing problems in biological science. There is a wide field of activity for the selection of effective immunomodulators and optimal schemes for their combined use with vaccines. The use of alternative prophylactic and therapeutic agents can significantly reduce the severity of the problem of antibiotic resistance.

МИКРОБИОЛОГИЧЕСКИЙ МОНИТОРИНГ СОСТАВА И АНТИБИОТИКОРЕЗИСТЕНТНОСТИ МИКРОБИОЦЕНОЗА ВЕРХНИХ ДЫХАТЕЛЬНЫХ ПУТЕЙ ПАЦИЕНТОВ С ДИСКОИДНОЙ КРАСНОЙ ВОЛЧАНКОЙ И ОГРАНИЧЕННОЙ СКЛЕРОДЕРМИЕЙ

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Актуальность. Ограниченная склеродермия (ОСД) и дискоидная красная волчанка (ДКВ) относятся к аутоиммунным заболеваниям соединительной ткани. Эти заболевания характеризуются наличием генетических дефектов в иммунорегуляторных процессах, что, в свою очередь, приводит к образованию множества антител к собственным клеткам организма. Это, а также использование иммуносупрессивной терапии, приводит к развитию и усилению иммунодефицитных состояний у пациентов, в результате чего могут происходить изменения в пейзаже микрофлоры верхних дыхательных путей, что выражается в уменьшении количества индогенных микроорганизмов и увеличении факультативных транзиторных видов.

Цель. Изучение состава микроорганизмов верхних дыхательных путей и чувствительности к антибактериальным препаратам разных химических групп