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ТЕОРЕТИЧНА МЕДИЦИНА: ОСНОВНІ НАПРЯМКИ РОЗВИТКУ BACTERIOPHAGES IN THE TREATMENT OF PERIODONTAL DISEASES

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Actuality: Periodontal tissues inflammatory and destructive diseases are one of the most common pathologies on the planet. According to the WHO [1, p. 15], more than 75% of the adult population the aged between 30 and 40 suffer from periodontitis, it means that people of working age suffer from complex etiological and pathogenetic pathologies. Periodontitis is a pathological process that affects all periodontal tissues, namely the gums, periodontal ligaments, the root cementum and the bone tissue of the alveoli. That is why this process eventually leads to tooth loss [1, p. 21].

Periodontitis is a polyetiological disease based on microbial factors. Microorganisms of the microbial biofilm (dental plaque) as a result of enzymatic activity have a destructive effect on periodontal tissues. More over, destructive processes may be the result of a localized response to inflammation caused by periodontal pathogenic flora of subgingival dental plaque [2, p.78] To date, we can clearly say which microorganisms are the most periodonto-pathogenic, these are gram-negative anaerobes that form the so-called "red complex": Actinobacillus actinomycetemcomitans, Porphyromonas gingivalis, Tannerella forsythia, Treponema denticula. They have excellent adhesive properties, toxicity and invasiveness. As a result of the progression of the pathological process, the depth of periodontal pockets increases, which is more favorable for the activity of these microorganisms and increases the area of their contamination [3, p.103–104].

Therefore, one of the tasks of treatment of periodontal diseases is to eliminate the microbial factor. But there are a number of difficulties. A considerable variety of microorganisms is present in the oral cavity, in addition to pathogens. There are also benign species, without which the functioning of the oral microbiota is impossible. In total, there are more than 500 different microorganisms in the oral cavity. And they exist in the form of a microbial biofilm – a natural ecosystem consisting of colonies of micro-organisms and extracellular polymer matrix, through which they exchange information and protect themselves from the aggressive effects of antibacterial drugs and human protection factors [4, p.48].

Objective: to analyses the data of usage bacteriophages in the treatment of periodontal diseases.

Materials and methods: more than 10 scientific articles and literary sources have been taken from the scientific electronic library eLIBRARY.RU, from the electronic database of medical and biological publications PubMed and analyzed.

Results: All antibacterial drugs that can affect the periodontal flora can be divided into three groups: antiseptics, antibiotics and bacteriophages. Antiseptics and antibiotics have a number of disadvantages:

– can cause a number of side effects from various organs and systems;

– can cause oral dysbiosis;

– are not always effective, as the microorganisms in the biofilm are quite protected;

– do not affect resistant strains, and over time form resistance in those microorganisms in which it was not.

Modern medicine is looking for new ways of the periodontal flora influence. Bacteriophages (bacterial viruses) are one of the natural agents that

can selectively act on certain strains of microorganisms. However, according to the WHO, resistant antibiotic-resistant bacteria may in the future level the achievements of modern medicine, including in the fight against infectious diseases [6] In this regard, in recent years, treatment with bacteriophages has become an important area. The advantages of bacterial viruses over antibiotics are: they are able to neutralize bacteria resistant to antibiotics, do not cause side effects, do not interact with other drugs, freely penetrate into the cells and tissues of the macroorganism, have an immunostimulatory effect and do not suppress immunity (immunosuppression). It is important that phage therapy can be prescribed to pregnant women and children [7, p.79]

The antibacterial effect of bacteriophages is carried out by inserting the phage genome into the bacterial cell, followed by its reproduction (replication) and lysis and destruction of the infected cell. As a result, new phages are formed, which enter the extracellular environment and infect new bacterial cells, repeat the reproduction cycle followed by lysis and thus act until the complete destruction of the bacterial cells in the area of inflammation. Reproductive cycles of specific bacteriophages and their accumulation at the site of inflammation are the basis of phage therapy. The properties described above distinguish them from chemotherapeutic agents, which have a wide range of action and are able to damage the normal flora. [8, p.651]

Conclusions: there are already registered drugs based on bacteriophages. They have shown their clinical effectiveness in the treatment and prevention of periodontal disease. However, the widespread use of phage therapy today is limited because there are no rational methods of local application of bacteriophages. Conducting targeted randomized trials can help to implement the widespread use of phage therapy and avoid a number of side effects as a result of taking antibiotics.

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ВПЛИВ УНІТІОЛУ НА ФУНКЦІЮ НИРОК У МОЛОДИХ СТАТЕВОНЕЗРІЛИХ ТВАРИН

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Унітіол (димеркаптопропансульфонат натрію) – антидотний препарат при гострих і органічних отруєннях тіоловими отрутами [1, с. 25–27]. Завдяки хімічній будові унітіол позитивно впливає на антиоксидантну систему захисту, захищає тіолові групи білків, пришвидшує реакції перекисного окиснення, посилює ефект глутатіону [2, с. 72]. Препарат застосовують для лікування інтоксикацій, спричинених отрутами, лікарськими препаратами, а також для зменшення побічних ефектів