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LOCAL PHYTOTHERAPY OF CHRONIC GENERALIZED PERIODONTITIS (REVIEW)

Shukurova U.A*; Azizova Sh. Sh; Yakhoyeva M***; Musashaikhova Sh.K******

^{1,4}Tashkent State Dental Institute
 Tashkent, Republic of UZBEKISTAN
 Email id: Shukurova U.A.,shua1981@mail.ru

ABSTRACT

Chronic generalized periodontitis is a serious medical, social and economic problem, and its complex therapy should affect all pathogenetic mechanisms of the development of this disease. In this regard, the local use of the therapeutic properties of the active components of herbal preparations as an alternative is relevant and affordable from an economic point of view.

KEYWORDS: *Periodontal diseases, Phytopreparations, chronic generalized periodontitis, Chlorhexidine, Metronidazole, Aloe vera, Gum inflammation.*

INTRODUCTION

Today in the structure of dental diseases one of the leading places is occupied by inflammatory periodontal diseases. This is due to their high prevalence among the population, an increase in the severity and intensity of the process, the formation of a chronic odontogenic focus of infection, and its adverse effect on the body [4, 12, 22]. According to the WHO, more than 95% of the population over 45 years old suffers from inflammatory periodontal tissue diseases.

Research conducted by Y. G. Tarasova et al. (2010) in the epidemiological study has shown that the prevalence of symptoms of periodontal tissue lesions CPITN index is high and ranges on average from 54.04% to 99.33%. With increasing age of those surveyed regularly increases the percentage of patients with inflammatory periodontal diseases. At a young age (15-34 years) is mainly dominated by the initial signs of periodontal tissue inflammation in the form of bleeding gums (32.06%) and tartar (21.15%). A periodontal pocket is detected in 5.58% of cases. With age, the number of persons with identified periodontal pockets increases: at 35-44 years - up to 28.37%; at 45-64 years old - up to 44.28%; at 65-74 years - up to 73.68%. The percentage of people in need of periodontal care, according to the CPITN index, averages 69.43%.

Among the inflammatory periodontal disease is given a special place of chronic generalized periodontitis (CGP), which is a serious medical, social, and economic problem and its complex therapy should affect all the pathogenetic mechanisms of the disease. Complex therapy of CGP should contribute to the elimination of clinical manifestations, which implies, among other things, the use of various medications and their combinations to achieve a positive result and increase the duration of remission [1, 14, and 25].

It is well known that the most effective methods of preventing periodontal disease are individual. The most effective program is to conduct professional oral hygiene, including the removal of dental plaque, if necessary, the use of local therapeutic agents, training in individual oral hygiene, and monitoring the quality of its implementation [1, 8, and 19]. In addition to this, local and systemic medications are also used in treatment: antiseptic drugs, antibiotics [12], non-steroidal and antimicrobial drugs, and others [5, 9].

Orthopedic and surgical interventions are performed after the removal of acute inflammation. Speaking about the complexity of the treatment of the disease, we also mean a multidisciplinary approach with the inclusion in the treatment plan of therapeutic, orthodontic, surgical, orthopedic interventions, if necessary, treatment of patients by specialists of related specialties.

The main and most numerous group of topical agents is the group of antiseptics. The number of representatives is quite large, however, the most often noted use of representatives of the groups of cationic detergents, halogens, phenols, herbal preparations [6, 16].

One of them is Chlorhexidine, the so-called "gold standard" among other medications used to eradicate periodontal infection. Chlorhexidine has a broad spectrum of action against gram-positive and gram-negative bacteria, yeast, dermatophytes, and lipophilic viruses, and is considered a stable and effective agent for reducing plaque and inflammation. [2, 6, 7, 24].

Some antibacterial agents such as triclosan, essential oils are used in commercial products for oral care to control plaque formation and halitosis [3, 6, and 18].

Today, all the more common methods antimicrobial effects that can reduce the side effects of the drug on the body, minimize the occurrence of side effects from the organs and systems can create and maintain the desired local concentration without increasing the content of pharmacological agents to the general circulation. One of these methods is the use of a method of local delivery of the drug with prolonged release, which will allow maintaining higher concentrations of the active substance at the injection site. [13, 23].

However, some inherent parodontopatogeny with high virulence and the ability to form biofilm is capable of exhibiting drug resistance to chemotherapeutic agents used in their uncontrolled and prolonged use. The development of drug resistance in periodontopathogens creates additional difficulties in the implementation of a full complex therapy CGP, reducing the effectiveness of both local and general therapeutic measures.

Due to the fact that antimicrobial therapy using drugs of synthetic origin can lead to a number of such adverse consequences as: disruption of the normal symbiosis of microorganisms, an increase in the development of allergic reactions, the ability to have hepatotoxic and immunosuppressive effects, suppression of the immunobiological resistance of the body, a

possible inhibitory effect on tissues periodontal disease and defense mechanisms, the risk of developing oral dysbiosis, impaired taste sensitivity [1,10,15,23].

Based on the foregoing, today widely used phytopreparation have a great demand at the local and general treatment of CGP. When creating an effective herbal remedy, it is necessary to take into account the experience of using medicinal plants in dentistry; analysis of the structure and structure of medicinal plants; chemical, physical properties, and biological effects of natural healing substances; knowledge and use of the latest methods and technologies of extraction, allowing to isolate biologically active substances from plants while maintaining their high natural activity in small doses.

The concept of "phytopreparations" has long been somewhat arbitrary, since plants were the main, if not the only, remedy. Since the 19th century, phytopreparations based on the analysis of the chemical composition of plants have been used in dental practice. This took into account not only the qualitative (vitamins, flavonoids, alkaloids, glycosides, etc.) but also the quantitative composition [15, 17, 20].

In the 20th century, an integrated approach to the study of medicinal plants began to be used, taking into account not only the content of biologically active substances in them but also the optimal methods for their extraction.

The literature has accumulated extensive material on the effects of plants and their preparations on the clinical course, local and general immunity, microflora, metabolism, and function of periodontal tissues.

At this time, herbal medicine is widely used in dentistry, both in our country and abroad in connection with the identification of its positive properties. Namely: the presence of a whole set of therapeutic properties, minimally toxic and side effects, no restrictions on the intake of other medications, the minimum likelihood of developing resistant strains, the availability, and ease of use of drugs [2,19,21].

Herbal preparations are characterized by complex chemical composition and, accordingly, the spectrum of biological action will be quite wide [5, 11, 17]. No wonder the same plant-based remedy can have a pathogenetic, immunomodulatory effect, and phytotherapy can also be considered as an adaptive therapy [4, 17, and 20].

Especially worth mentioning is phytopreparations property as recovery and normalization of tissue metabolism along with increased efficiency of treatment of underlying disease, which is particularly valuable in the treatment of pathologies periodontal tissues [4,16].

The homeopathic method is recognized as one of the areas of herbal medicine. The drugs of this group do not serve to destroy microorganisms, are not used for substitution therapy or to stop a certain pathological process, they help to restore the body's self-regulation. The homeopathic preparation consists of dozens of components of plant and mineral origin is widely used in the treatment of inflammatory phenomena in periodontal tissues in the form of ointments, tablets, or injections. It is noted that it has an analgesic, anti-inflammatory effect with the ability to improve microcirculation in the focus of irritation and stimulate healing processes [8, 14, 20, and 22].

The results of domestic and foreign scientific works prove the advisability of using herbal antioxidant drugs in the complex therapy of dental diseases. The range of complex preparations

from medicinal herbal raw materials, which is used in the treatment of diseases of the oral cavity, is small, therefore, the expansion of the arsenal of medicinal preparations based on herbal raw materials and their standardization is an urgent task. As the object of study to use ready raw aerial parts of the four species of medicinal plants: rough hypericum, chamomile flowers, leaves, sage, and calendula flowers drug. To investigate the antioxidant activity (AOA) of water-soluble substances prepared aqueous plant extracts of plants. 1 g of milled plant raw material was placed into a flask filled with 100 ml of distilled water at room temperature and a boiling water bath with occasional stirring for 15 min [3, 14, and 23].

AOA preparation "Parodontfit", which is a liquid extract of medicinal plants: rough hypericum, chamomile flowers, leaves, and flowers of *Salvia officinalis* calendula dosage in a ratio of 1: 1: 1: 1 and the ethanol to 60.0% (obtained by extraction and percolation 70.0% ethyl alcohol) was studied in dilutions of 1:10; 1:20 and 1:40 [3,19,21].

Green tea is a popular nutraceutical and has strong antioxidant properties. It contains polyphenols, which include flavonols, flavonoids, and phenolic acids. Antioxidants protect body cells from the destructive effects of reactive oxygen species such as singlet oxygen, superoxide, and peroxy radicals. An imbalance between antioxidants and reactive oxygen species leads to oxidative stress, which ultimately leads to cell damage [5, 22].

Several studies have proven the efficacy of turmeric extract as a gel and as part of a periodontal chip for application to periodontal pockets.

A study conducted by foreign authors included a comparative clinical and microbiological assessment of the effectiveness of using the Neem chip in conjunction with basic conservative therapy in comparison with conservative therapy without the use of any additional drugs in the treatment of periodontitis and found that long-term drug release systems prevent recolonization pathogens over a long period; determined a significant improvement in all clinical parameters in the study group compared with the control group, the quantitative presence of *P. gingivalis* significantly decreased in response to local drug delivery. It was revealed that Neem extract has a powerful immunostimulating activity, as evidenced by the state of both humoral and cellular immunity [10, 22].

Proven effectiveness in the prevention and treatment of inflammatory processes in the periodontium - dental adhesive based horsetail(*equisetum*), which has drainage properties and pronounced antimicrobial activity against strains of the four test cultures staphylococci [12,23].

To reduce the degree of inflammation of the periodontal tissues, oils of rosemary, eucalyptus, clove, mint have proven themselves well, used both in isolation and included in the composition of various combined drugs [2, 17].

The researchers found that the alkaloids present in barberry were more effective against bacteria such as *A. Actinomycetemcomitans* and *P. gingivalis* than against lactobacilli and streptococci. Berberine has also been shown to inhibit collagenase of these two species [3, 9, and 19].

Ahuja S. et al. (2011) used chamomile and pomegranate extracts in mouthwash in patients with periodontal tissue inflammation. It has been proven that this medicine has a pronounced anti-inflammatory and antimicrobial effect, and can be used as an additional therapeutic agent for the restoration and maintenance of periodontal health.

An experimental study using the method of automatic cultivation made it possible to reveal that phytopreparations "Tonsinal" and modified plate "CM-1" characterized sided impact on the key stages in the development of bacterial populations. The average optical density of samples with the addition of phytopreparations of various concentrations is lower than in control samples - during the cultivation of *A.actinomycetemcomitans* and *P.intermedia* by 83% and 60%, respectively, during the cultivation of *F.nucleatum* - by 35%, *S. constellatus* - by 23%, *C. Albicans* - by 22%. The optimal concentration of active substances of phytopreparations for providing antimicrobial action on *A. actinomycetemcomitans*, *P. gingivalis*, *P. intermedia*, *F. nucleatum*, *S. constellatus*, *C. Albicans* is: for Phytopreparation "Tonsinal" - 0, 125 mg/ml, for plates "CM-1" - 5 times higher than the concentration in the original sample. Clinical evaluation of the effectiveness of the treatment in the comparison groups revealed a significant improvement in the state of periodontal tissues based on the values of hygienic and periodontal indexes. Evaluating the level of hygiene of patients, the degree of bleeding of the gingival sulcus, significantly lower values were obtained in patients of the group for whom phytopreparations "Tonsinal" [9, 18, 20].

In the last 10 years, scientific research in periodontology has revealed the positive properties of Aloe vera, which have a direct effect on the links in the pathogenesis of inflammatory phenomena in the periodontium. This is the ability to provide anti-inflammatory, analgesic, antibacterial action when included in the composition of kinds of toothpaste, elixirs for rinsing in the complex treatment of CGP. As a local delivery system, Aloe vera gel was used in combination with SRP (scaling and root planning), which ultimately led to a decrease in clinical parameters such as plaque index, probing depth, and an increase in the level of clinical attachment. The anti-inflammatory effect of Aloe vera is associated with inhibition of cyclooxygenase and a decrease in the production of prostaglandin E2 [5, 15, and 24].

Based on all the above can be argued that the main etiological factor in the onset and development of periodontal diseases is subgingival microbial biofilm. The widespread prevalence of this pathology, its rejuvenation in recent years, the insufficient effectiveness of the preventive measures carried out justify the need to study the etiopathogenesis of this pathology and the search for new effective means and their combinations to achieve a positive therapeutic result. Despite the desire for comparison of means and methods to the established conventional standards and creating new combined means which have in their composition, as a plant component and a chemical antimicrobial agent of antiseptics groups and other pharmacological groups.

The search for alternative means to increase the effectiveness of treatment of periodontal diseases of inflammatory genesis is still an urgent task. In this regard, the local use of the therapeutic properties of the active components of herbal preparations as an alternative is relevant and affordable from an economic point of view.

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