СРАВНИТЕЛЬНАЯ ОЦЕНКА ЭФФЕКТИВНОСТИ ПЕПТИДСОДЕРЖАЩЕГО ПРЕПАРАТА И ПОЛИОКСИДОНИЯ В ЛЕЧЕНИИ ХРОНИЧЕСКОГО ПАРОДОНТИТА

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Резюме. В настоящее время существующие методики лечения хронического пародонтита не способны оказывать комплексное влияние на проблему. Сложность этиопатогенетических взаимодействий в развитии данного заболевания, а также высокая распространенность инфекционных патологий полости рта обусловливают склонность данного заболевания к хронизации. Пародонтит, развивающийся на фоне изменений локального и общего иммунного статуса, оказывает значительное влияние на качество жизни пациентов, а также затрудняет последующее восстановительное лечение. Таким образом, подход к лечению данной патологии должен быть направлен не только на устранение этиологического фактора, но и на коррекцию иммунологического фона. В соответствии с этим, в последние годы проводятся активные исследования и разработка новых методик лечения и препаратов, которые бы оказывали комплексный этиопатогенетический эффект на данное заболевание.

В данной статье приводится сравнительная оценка классического и экспериментального методов лечения хронического пародонтита. Основываясь на воссоздании экспериментальной модели хронического воспаления тканей пародонта на крысах линии Wistar, были сравнены методы топической терапии композицией «кремнийорганический глицерогидрогель – пептид» и «Полиоксидоний», проведена сравнительная оценка активности данных препаратов с контрольными группами, лечение которых осуществлялось «кремнийорганический глицерогидрогель» и «Метрогил Дента».

Ранее нами были проведены отдельные исследования эффективности применения композиции «кремнийорганический глицерогидрогель – пептид», а также способа лечения пародонтита путем инъекций препарата «Полиоксидоний». Их сравнивали с классическим методом лечения данного заболевания для получения соответствующих данных и результатов.

На наш взгляд, полученные данные представляют значительный интерес. Проведена оценка и сравнение клинических и гистологических данных, которые показали, что все препараты оказывают положительное воздействие на процессы регенерации тканей, однако композиция «кремнийорганический глицерогидрогель – пептид», за счет особенности гидрогеля действовать в качестве транску-

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танного проводника, показала более быстрое противомикробное и патогенетическое действие, что позволяет комплексно подойти к решению данной проблемы. По сравнению с группами глицерогидрогель кремния и «Полиоксидоний» сроки клинического улучшения в группе глицерогидрогель-пептид увеличились на 57%, а с группой «Метрогил Дента» показатели улучшились примерно на 15%.

Ключевые слова: кремнийорганический глицерогидрогель, антимикробные пептиды, хронический пародонтит, Полиоксидоний, Метрогил Дента, воспаление

COMPARATIVE EVALUATION OF THE EFFECTIVENESS OF A PEPTIDE-CONTAINING DRUG AND POLYOXYDONIUM IN THE TREATMENT OF CHRONIC PARODONTITIS

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Abstract. Currently, the available methods of treating parodontitis are not able to have a complex effect. Therefore, in recent years, there has been an active search and development of new methods of treatment and new drugs that have a complex etiopathogenetic effect on this disease.

This article provides a comparative evaluation of the classical and experimental methods of treating chronic periodontitis. Based on the reconstruction of an experimental model of chronic inflammation of periodontal tissues of the Wistar rat line, we compared methods of topical therapy by "Organosilicon Glycerohydrogel – Peptide" and "Polyoxidonium" compositions. A comparative assessment of the activity of these drugs with control groups, which were treated with "Organosilicon Glycerohydrogel" and "Metrogyl Denta", was carried out.

Previously, we carried out separate studies of the effectiveness of the use of the composition "organosilicon glycerohydrogel – peptide", as well as the method of treatment of periodontitis, by injecting the drug "Polyoxidonium". They have been compared with the classic treatment for this disease to obtain relevant data and results.

In our opinion, the data obtained are of considerable interest. The assessment and comparison of clinical and histological data have been carried out, which showed that all drugs had a positive effect on the processes of tissue regeneration. However, the composition "Organosilicon Glycerohydrogel-peptide", due to the characteristics of the hydrogel, which is acting as a transcutaneous conductor, showed a faster antimicrobial and pathogenetic effect, which allows a comprehensive approach to solving this problem. In comparison with the groups of "Organosilicon Glycerohydrogel" and "Polyoxidonium", the period of clinical improvement increased by 57% in the group of "Glycerohydrogel-Peptide", and, in the "Metrogyl Denta" group, the indicators improved by 15% approximately.

Keywords: silicon glycerohydrogel, antimicrobial peptides, chronic parodontitis, Polyoxidonium, Metrogyl Denta, inflammatory

Introduction

The peculiarities of the development and course of periodontitis, as well as the imperfection of comprehensive programs for the prevention and treatment of this disease, contribute to the high prevalence of this pathology. According to the World Health Organization, the prevalence of this disease among the adult population is about 90-95%.

The polymorphism of etiological factors, the complexity of pathogenetic processes and the high resistance of microorganisms to a wide range of antibacterial drugs [2] causes the necessity of improvement of methods of treating periodontitis, as well as the need to search for modern and universal drugs that would be able to have a multi-link effect [14].

Periodontitis is an inflammatory disease of the tissue complex of the dentoalveolar segments, including the supporting-retaining ligamentous apparatus of the tooth (periodontium) [1], bone tissue and the complex of soft tissues of the dentoalveolar segment (periosteum, gums), leading to atrophic processes in these tissues and, as a result, to loss of teeth. From the point of view of modern concepts of the development of this disease, atrophic processes are explained by the development of cellular and humoral reactions of the immune system in the tissues of the mucous membrane.

In chronic parodontitis, microorganisms colonize in the gingival sulcus, which activates the mechanisms of innate immunity in the periodontal tissues. Toll-like receptors located on epithelial cells recognize pathogens and activate local immune responses, induce the production of cytokines, chemokines, and antimicrobial peptides. The lack of production of antimicrobial peptides is one of the most important factors that determine the chronicity of pathological processes in the mucous membrane.

The available drugs for the treatment of periodontitis are capable of either exerting an effect only on pathogenesis, by suppressing inflammatory reactions, or only on the etiological factor, due to the presence of antimicrobial agents, such as chlorhexidine, in the composition. Accordingly, they are not capable of having a complex effect.

In addition to that, with the lack of a proper approach to the treatment of periodontitis in the early stages, the pathogenic microbiome is activated [5] and the immune responses are destabilized, which leads to the chronization of the process and the lack of a proper response to the following treatment [7]. Thus, it is needed to base the treatment on using drugs that support the activation of immune responses and influence the etiological factor of the disease.

Conservative therapy is of great importance in the treatment of chronic parodontitis. Compared to other methods, such as surgical and orthopedic treatment, conservative therapy allows us to approach the problem of this disease in the least invasive, but at the same time, no less effective approach. The possibility of using it in the early stages of the disease, as well as using it as a supportive therapy, allows us to achieve the elimination of foci of inflammation, long-term stabilization of the periodontal condition, and also to prevent the transition of the inflammatory process to deep-lying tissues.

The most perspective drugs with these characteristics are "Polyoxidonium" and the "Organosilicon Glycerohydrogel – peptide" composition. Composition with peptides, in contrast to "Polyoxidonium" [3, 6, 13], is capable of both activating the immune response and directly affecting the etiological factor of periodontitis: microorganisms. Also, in combination with "Organosilicon Glycerohydrogel", which has transcutaneous activity, this composition has the great potential in the treatment.

The presence of transcutaneous activity of the gel allows one to minimize the dose of the administered drug and shorten the duration of treatment, while not reducing the effectiveness of treatment.

Thus, **the aim of the study** was a comparative assessment of new methods of treatment of chronic periodontitis, with the classical treatment regimen with the antimicrobial agent 'Metrogyl Denta'.

Materials and methods

Based in the Federal State Institute of Immunology and Physiology, Ural Branch of the Russian Academy of Sciences, Russian Federation, Yekaterinburg, a study was carried out on 4 groups of laboratory rats of the "Wistar" line. Each group included 10 rats. The study included recreating a model of chronic periodontitis by inserting a 12 mm needle into the periodontal space and its following extraction on the 26th day (RF patent No. 2545923) [4, 12]. All painful procedures were realized in accordance with The WMA Declaration of Helsinki.

In the first and second groups, treatment was carried out by application of "Glycerohydrogel-Peptide" and "Organosilicon Hydrogel" (IOS UB of the RAS, Yekaterinburg) compositions to the area of the inflammatory focus, with the following clinical assessment of the effectiveness of treatment [9].

In the third group, treatment was carried out by injecting the 'Polyoxidonium' (RPU Petrovax pharm, Russia), drug into the gums. In the fourth group, by application of 'Metrogyl-Denta' (Unique pharmaceutical Lab, India) gel to the area of the inflammatory focus [10].

Data about the control groups, which did not get the treatment, has been described in previous studies and used for comparison [8, 11].

Results and discussion

As a comparative analysis of the studies, the changes in clinical parameters were assessed, as well as the analysis of the histological picture. For comparison of clinical indicators, the following symptoms were taken into account: hyperemia and swelling of the gums, discharge of pus from the periodontal space, change in features. In comparison with the groups of "Organosilicon Glycerohydrogel" and "Polyoxidonium", the period of clinical improvement increased by 57% in the group of "Glycerohydrogel-Peptide", and, in the "Metrogyl Denta" group, the indicators improved by 15% approximately.

In addition, comparative histological analysis was carried out to assess the nature of morphological changes.

According to the results of the histological study, it was noted that in the group of "Organosilicon Glycerohydrogel", the histological picture had a dynamic improvement: plasmacytic infiltration gradually decreased, and the processes of tissue repair tended to a slower restoration of the normal structure. In this group, the regeneration process took 21 to 30 days. While in the "Glycerohydrogel-Peptide" group, a more saccadic improvement was observed: extensive plasmacytic infiltration was observed on days 3-15 after treatment, and the histological picture improved dramatically on days 16-20 (Figures 1, 2, 3, see 3rd page of cover).

The composition of "Glycerohydrogel-Peptide" showed a better therapeutic effect than the groups of "Organosilicon Glycerohydrogel", "Polyoxidonium" and "Metrogyl Denta", since the change in the clinical and histological picture was more intense. An expansive change in the structure of tissues and histological signs of inflammation allows us to assume that the composition of "Glycerohydrogel-Peptide" affects several pathogenetic links of the disease, in particular, the cellular and humoral links of immunity.

In addition, the nature of the change in the clinical picture after treatment with the "Glycerohydrogel-Peptide" composition allows us to suggest that the time frame for clinical improvement is an indicator of good antimicrobial activity of the composition. Acceleration of the healing time and a different clinical course of the inflammatory process when using the "Glycerohydrogel-Peptide" composition, in comparison with the other groups, showed the effectiveness of topical therapy of chronic periodontitis with using peptides in the studied animals.

Conclusions

1. Histological examination confirmed the normalization of tissue structure in all groups. However, the period of regeneration in the "Glycerohydrogel-Peptide" group was 1.25 times shorter (16 to 20 days) than in other groups (from 20 days).

2. Due to the presence of "Glycerohydrogel" and peptide in the composition, both the pathogenetic and etiological links of the disease are influenced.

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