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THE EFFECTIVENESS OF SCLEROTHERAPY IN THE TREATMENT OF HYPERTROPHIC GINGIVITIS

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The etiology, pathogenesis and treatment of gingivitis are one of the pressing and unresolved problems of modern dentistry. In this regard, among periodontal diseases, hypertrophic gingivitis is of particular importance. It is known that hypertrophic gingivitis is characterized by the complexity of etiopathogenesis, chronic course and the presence of a false gingival pocket compared to catarrhal and ulcerative-necrotizing gingivitis. At the same time, the treatment of this pathology requires a wider range of treatment compared to others, since in many cases the results of the treatment used are not effective and long-lasting. Taking this into account, we performed sclerotherapy with a dental drug based on lauromacrogol-400 in the treatment of chronic fibrous-hypertrophic gingivitis. As a result of the studies, it was established that as a result of using the drug for the purpose of sclerotherapy, the main symptoms of hypertrophic gingivitis were eliminated in a short time, and the treatment was long-term. This is confirmed by the results of observations carried out 6 and 12 months after the end of treatment, respectively.

Key words: chronic hypertrophic gingivitis, sclerotherapy, lauromacrogol, sodium hydrogen phosphate, potassium dehydrogen phosphate.

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ЕФЕКТИВНІСТЬ СКЛЕРОЗУЮЧОЇ ТЕРАПІЇ ПРИ ЛІКУВАННІ ГІПЕРТРОФІЧНОГО ГІНГІВІТУ

Етіологія, патогенез та лікування гінгівіту є однією з актуальних та невирішених проблем сучасної стоматології. У зв'язку із цим серед захворювань пародонту особливе значення має гіпертрофічний гінгівіт. Відомо, що гіпертрофічний гінгівіт відрізняється складністю етіопатогенезу, хронічним перебігом та наявністю помилкової пародонтальної кишені в порівнянні з катаральним та виразково-некротичним гінгівітом. У той самий час лікування даної патології вимагає ширшого спектра лікування порівняно з іншими, оскільки у багатьох випадках результати лікування не є ефективними і тривалими. З огляду на це, ми провели склеротерапію стоматологічним препаратом на основі лауромакроголу-400 при лікуванні хронічного фіброзно-гіпертрофічного гінгівіту. В результаті проведених досліджень встановлено, що внаслідок застосування препарату з метою склерозуючої терапії, основні симптоми гіпертрофічного гінгівіту були усунені в короткий термін, а результати лікування мали довгостроковий характер. Це підтверджують результати спостережень, проведені відповідно через 6 та 12 місяців після закінчення лікування.

Ключові слова: хронічний гіпертрофічний гінгівіт, склерозуюча терапія, лауромакрогол, гідрофосфат натрію, дегідрофосфат калію.

Gingivitis is an inflammatory process of the gingiva. Unlike periodontitis, only the gums are involved in the pathological process. However, this does not reduce the danger of the disease – if left untreated, inflammation can affect deeper tissues, and then there is a risk of tooth loss. The most common cause of gingivitis is poor personal oral hygiene. Violation of the rules may consist of inappropriate technique, irregular brushing of teeth, refusal to use dental floss and rinses after meals. As a result, food particles accumulate between the teeth, and a large amount of soft plaque forms on the surface of the teeth. This is a favorable environment for the proliferation of bacteria, which leads to the inflammatory process [11].

Hypertrophic gingivitis is a chronic disease characterized by inflammation of the gums, its dynamic growth and the formation of a false gum pocket. In some cases, gum hyperplasia even rises above the level of the equator of the tooth. Local and general factors play an important role in the development of this pathology. Local factors include: incorrect placement of the frenulum in the oral cavity, its relatively low position, various dental pathologies, the presence of tartar, improper filling, errors made in the manufacture of orthopedic and orthodontic structures, etc. [3]. The most significant general factors include chronic diseases of the nervous and endocrine systems, vitamin C deficiency, long-term use of hormonal drugs and antibiotics, as well as hormonal imbalance in adolescence, diabetes mellitus, blood diseases, etc.

With hypertrophic gingivitis, active growth of cells of the basal layer of the epithelium of the mucous membrane of the cavity occurs and, if treatment is not carried out in time, the process of growth of gum tissue will continue [3].

In modern dentistry, there are two forms of hypertrophic gingivitis – edematous and fibrous. The following symptoms are characteristic of the edematous form:

– Pain in the affected areas;

– Feeling of bleeding and burning gums;
– Growth and change in color of gingival papillae;
– Pathological – formation of pathological periodontal pockets;
– Presence of tartar

In the fibrous form, the pathological growth of gingival tissue intensifies even more, the consistency of the gum becomes denser, an aesthetic defect appears, eating becomes difficult, the surface of the gum becomes light pink and has an uneven surface. In this case, bleeding and pain are not observed. On examination, soft and hard subgingival deposits are detected [11].

If hypertrophic gingivitis occurs against the background of leukemia, then gum hyperplasia increases, and pain appears even at rest.

Treatment of hypertrophic gingivitis is determined depending on the severity of the pathology, clinical course and duration of the process.

The treatment program includes the following:
– Removal of dental plaque;
– Physiotherapy;
– Sanitation of the oral cavity;
– Antiseptic rinses;
– Elimination of local irritating factors;
– Gum massage;
– Rubbing hormonal gels into the affected areas (application);
– Sclerosing therapy;

If the mentioned treatment procedures do not have an effective effect, then surgical treatment methods such as gingivotomy and gingivectomy are used [5, 11].

As already mentioned, in the treatment of hypertrophic changes that occur in the oral mucosa and gums, traditional conservative treatment measures using sclerotherapy are effective. Recently, there are several works about practical value of this method [4, 6, 7]. However, the information of effectiveness is controversial.

The purpose of the study was to assess the effectiveness of the dental drug based on lauromacrogol with a sclerosing effect in the treatment of hypertrophic gingivitis.

Materials and methods. The study was performed in the Dental Clinic of Azerbaijan Medical University. To achieve the goal, 18 patients with chronic fibrosing hypertrophic gingivitis took part in the examination; of which 8 are men and 10 are women. The age indicator among men was in the range of 30–40, and among women – in the range of 20–50. According to localization, 70 % of the pathology was observed in the vestibular part of the anterior (frontal) teeth of the lower jaw. According to the given anamnestic data, the period of occurrence of hypertrophic gingivitis in different patients corresponds to 1–4 years. It was also found that approximately 15–20 % of patients at various times consulted a dentist for the treatment of hypertrophic gingivitis. According to some of them, improvement occurred within a short period of time after treatment, and after a certain time the main symptoms of the pathology (pain, bleeding, burning, discoloration of the gums, etc.) appeared again. At the same time, it became known that the treatment was carried out only by a dentist (symptomatic treatment), and joint consultations with endocrinologists, hematologists, therapists and other specialists were not held.

When examining the majority of patients against the background of inflammatory periodontal diseases, hypertrophic gingivitis was identified as a result of the following reasons: unsatisfactory hygienic condition of the oral cavity, the presence of supragingival and subgingival stones, unusable removable and fixed dentures, poor-quality filling material and incorrectly placed fillings.

An examination carried out with the participation of an endocrinologist revealed that the occurrence of hypertrophic gingivitis in 2 patients was associated with hormonal imbalance.

18 examined patients were divided into two groups: main and control. After confirming the diagnosis of hypertrophic gingivitis in both groups and determining the occurrence of this disease against the background of local or system-wide diseases, therapeutic measures were carried out.

In accordance with the guidelines, symptomatic treatment of hypertrophic gingivitis was prescribed to 8 patients of the main group; for this purpose, antiseptic, antibacterial, desensitizing and keratoplasty drugs were used.

Before carrying out symptomatic treatment measures, supragingival and subgingival stones were removed, unsuitable fillings were replaced, traumatic factors were eliminated, including defects in orthopedic and orthodontic prostheses. 10 patients included in the control group underwent the same sanitation measures as in the main group.

In addition, sclerosing therapy for gingival hyperplasia was used in both the main and control groups. For this purpose, the main group used a 30 % glucose solution, and the control group used drug based on lauromacrogol – Aethoxysklerol® (Lomapharm rudolf Lohmann, Germany). In the respective

groups, both drugs were injected into the apex of the hypertrophied gingiva after oral healing improved. The results were analyzed in a comparative manner both during treatment sessions (10 sessions) and over long periods (6 and 12 months). The differences were considered statistically significant at $P < 0.05$. Statistical processing was carried out using the "Statgraph" program.

Results of the study and their discussion. The early and long-term results of complex treatment of chronic hypertrophic gingivitis, including sclerotherapy, were studied.

According to results obtained in the process of study (during the treatment period) and over long periods, it was found that during the first 5 days of treatment, compared to the main group, the size of the hypertrophied gums in the control group decreased significantly, and practically no signs of inflammation were found in this part. The results obtained on the basis of anamnestic data also suggest a correlation between the duration of hypertrophic gingivitis and the effectiveness of treatment. That is, the longer the duration of the pathological process, the less effective the treatment used.

In the control group, when examined 6 months after treatment, no significant changes in the size, configuration and color of the gums were observed. To determine the presence of signs of inflammation in the gums, the PMA index (papillary-marginal-alveolar) and the Schiller-Pisarev test were used. The results of these tests also confirmed the absence of inflammation in the gums. According to our results, the dental drug based on lauromacrogol, used in the treatment of chronic hypertrophic gingivitis, creates a sclerotic effect on the fibrotic part of the gums, prevents the recurrence of inflammation (according to PMA index ($p<0.05$) and the Schiller-Pisarev test ($p<0.01$) in comparison with first measurements and with the control group ($p<0.01$ and $p<0.001$, respectively).

During the examination carried out after 1 year, no subjective complaints from the patients were registered, and according to the results of the objective examination, no significant changes were revealed.

Nowadays sclerotherapy have been used in the treatment of pathologies of gingiva. Besides it, cryosurgery is one of prevalent methods. Even some rare diseases of gingiva such as gingival varices and malformation which are characterized by rare occurrence and the difficulty of managing, may be effectively treated with sclerotherapy. The hypertrophic gingivitis, which is studies in our investigation, is more prevalent, so, it is very useful to assess the effectiveness of sclerotherapy in dental practice [4, 8].

Sclerotherapy was considered as an alternative and effective treatment modality, as it is a simple and noninvasive procedure with a better safety profile, repeatability, and low cost of treatment even when multiple sessions are needed with low recurrence rate. Soni AG. Et al, revealed that sclerotherapy with 3% sodium tetradecyl sulfate has been proved to be effective as a conservative approach in the treatment of oral pyogenic granuloma. The authors described the case report is an attempt to emphasize the effectiveness of sclerotherapy with 3 % of sodium tetradecyl sulfate in the management of oro-gingival pyogenic granuloma, particularly when the lesion is large and occurs in the anterior esthetic zone of the oral cavity [12]. We use for sclerotherapy the other drug- substance based on lauromacrogol, however, our results were characterized with the similar high effectiveness. Lauromacrogol, with the other parts of drug we used (the excipients – ethanol 96 %, sodium hydrogen phosphate, potassium dihydrogen phosphate, water for injection, is a detergent (rinse aid) with surface-active properties. When proteins enter the tissue, they are denatured, the vascular endothelium is damaged, resulting in the formation of a local thrombus. Damage to the vascular endothelium depends on the volume and concentration of the drug entering the hypertrophy zone. After the injection, a pressure bandage is immediately applied to this area, which, by compressing the venous vessels, prevents excessive thrombus formation and recanalization of the initially formed parietal thrombus. Thus, the newly formed fibrous scar ensures sclerosis of the veins. In addition, this drug also has an analgesic effect, it not only reduces the local sensitivity of receptors, but also disrupts communication through sensory nerve fibers, and also prevents the occurrence of pain during sclerotherapy. So, the medicine was chosen for our study in accordance with the above specifications.

The other dental pathology which may be the object for nonsurgical treatment methods, is drug-induced gingival overgrowth, also referred to as drug-induced gingival enlargement and previously known as drug-induced gingival hyperplasia. These cases related to side effects of certain drugs in which the gingival tissue is not the intended target organ (anticonvulsants, immunosuppressants, and calcium channel blockers). Gingival overgrowth impedes proper dental hygiene and, apart from the cosmetic damage, causes painful chewing and eating. Our patients had the similar complaints, but according to the purpose of current study we evaluated effect of treatment in patients with only hypertrophic gingivitis [13].

Lione R, et al, studying 33 males and 27 females with overgrown gingivae on the labial side of the anterior teeth secondary to fixed appliance therapy, six maxillary anterior teeth present, and healthy non-smokers patients. The authors compared 3 groups: subjects underwent a conventional scalpel gingivectomy of the maxillary anterior sextant; subjects were treated using laser-assisted gingivectomy and subjects assigned to the third group underwent only non-surgical periodontal treatment and served as control group. According to results of periodontal parameters), which were measured at 1, 3, and 6 months, the adjunct

use of both scalpel gingivectomy and laser gingivectomy was more effective in controlling gingival inflammation than non-surgical periodontal treatment alone at 1, 3 and 6 months. In the control group, greater improvement in the periodontal parameters were observed within 3 months, depending on a self-care approach [10]. We assessed the early and long-term outcomes (during treatment and after 6 and 12 months and that fact increases the value of our study results.

As we noted earlier, in nowadays clinical practice, conservative noninvasive treatment options have been vital consideration for patients with pathologies of gingiva. One of methods id diode laser. The efficacy of the diode laser with different wavelengths, as one of these noninvasive treatment options, has been documented in the treatment of various diseases of gingiva due to a number of advantages, including tissue incision, coagulation during surgery and postoperative benefits [1, 2, 9]. On the other hand, sclerotherapy has been suggested to be an effective treatment modality [12, 14]. It would be a good treatment choice whenever the lesion is either large or develops in a surgically inaccessible area [7].

Anwar SK, et al with the aim to clinically assess the effectiveness of diode laser versus sclerotherapy, as bloodless approach, in the treatment randomly divided 20 patients with oral pyogenic granuloma into two groups, with those in the test group being managed via diode laser application and those in the control group via injections of ethanolamine oleate as a sclerosing agent. All patients were evaluated intraoperatively for bleeding severity and postoperatively for pain. The quality of healing was also assessed using Landry healing index after the 1st, 2nd and 4th weeks. Additionally, the patients were recalled after 3, 6 and 9 months from the end of treatment for recurrence evaluation. They revealed that for different intervals, the sclerotherapy group had a higher healing quality index than the laser group, and the fact that recurrence occurred in the laser group, there were no cases of recurrence in the sclerotherapy group in all intervals. However, that study had some limitations. These include using a convenience sampling technique, a relatively small sample size which might have impacted the study power, so the authors noted that further studies with larger sample sizes are still needed and would allow more solid conclusions to be drawn [2].

Conclusion

The dental drug based on lauromacrogol, used in the treatment of chronic hypertrophic gingivitis, in a short time creates a sclerotic effect on the fibrotic part of the gums, prevents the recurrence of inflammation (according to PMA index ($p<0.05$) and the Schiller-Pisarev test ($p<0.01$) in comparison with first measurements and with the control group ($p<0.01$ and $p<0.001$, respectively). The most importantly, the positive results of treatment are long-term is presented. Considering all this, we consider it acceptable to use ethoxysclerol in sclerosing therapy of gums in practical dentistry.

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