

**COMPREHENSIVE TREATMENT OF PERIODONTAL DISEASES USING LOW-INTENSITY  
MAGNETIC LASER RADIATION*****Tashmuhammedova Shaxnoza****Clinical resident of the 2nd year of the Department of Orthopedic Dentistry, Samarkand state medical university, Uzbekistan****Burxonova Zarafruz Qobilovna****Scientific adviser, Assistant of the Department of Orthopedic Dentistry, Samarkand state medical university, Uzbekistan***ABOUT ARTICLE****Key words:** Gingivitis, low-intensity laser, inflammation Currently.**Received:** 04.02.2024**Accepted:** 09.02.2024**Published:** 14.02.2024**Abstract:** The results of a clinical study evaluating the periodontal tissue index and functional vacuum testing indicate the effectiveness of low-intensity laser therapy in the combined treatment of chronic generalized catarrhal gingivitis. The use of this treatment method led to a faster reduction of inflammatory changes in the periodontal ligament and minimal discomfort for the patient compared with the control group in which a low-intensity laser was not included in the combined treatment plan.**INTRODUCTION**

The treatment of periodontal diseases is an urgent problem of dentistry: according to WHO, the incidence of periodontal disease is very high in the age groups 35-44 (65-98%) and 15-19 (55-89%) years. Early detection and treatment of periodontal diseases is especially important [2, 4]. Gingival inflammation develops in the gingival sulcus, where the quantitative and qualitative composition of the gingival fluid changes. In the gingival sulcus, the number of polymorphonuclear leukemic cells increases, their degranulation occurs under the influence of endotoxin, accompanied by the release of lysosomes from cells. Enzymes formed in lysosomes (proteases, hydrolases and lysozymes) interact with surrounding structures, causing and contributing to changes. Cellular mediators include histamine, serotonin, prostaglandins, lymphokines and slow-reacting substances, the release of which is carried out by polymorphonuclear leukemic cells, mast cells and basophils.

Biologically active components cause a rapid increase in vascular permeability, impaired microcirculation, slowing blood flow, increased thrombosis, the development of vasculitis, decreased clotting and increased fibrinolysis, as well as secondary hypoxia. These changes lead to depolymerization of the intercellular substance of the gingival sulcus epithelium, the appearance of vacuoles and crevices, and create favorable conditions for the deep penetration of toxins and bacteria into the underlying tissues. Violation of microcirculation increases the permeability of blood vessels and tissues. Violation of protective mechanisms is accompanied by inhibition of regenerative processes, the formation of pathological granulation tissue and the spread of inflammation to deeper underlying tissues (alveolar bone) [2]. The treatment of periodontal diseases is complex and requires maximum individualization. There are various methods of treatment and prevention of periodontal diseases, among which physiotherapy is of great importance. They are widely used at the stages of diagnosis, complex treatment, prevention and rehabilitation to influence the individual etiological significance of the process, as well as symptomatic treatment. Physical factors can stimulate the immunobiological response of the body, reduce the phenomena of systemic and local sensitization, change neurohumoral processes in the body and pathological focus, enhance the local selective effect of drugs and restore microcirculation [4]. Timely and correct administration of physical factors of combination therapy allows to stop the initial symptoms of pathology, reduce its severity, severity of clinical manifestations, the possibility of complications or contribute to a change in the stage of pathology, allowing other types of therapy to be carried out in the most favorable conditions [1, 3]. MATRIX is a low-intensity laser irradiation device (LILI); under the influence of LILI there is a photoinduction of macromolecules, a change in the structure of water and the release of calcium ions from calcium reserves. The concentration of calcium ions in the cytoplasm increases. Laser therapy is a highly effective method of treating many diseases and is widely used in various branches of medicine:

activation of cellular metabolism and increase of its functional activity;

stimulation of regenerative processes;

anti-inflammatory effect;

activation of blood microcirculation and increase in the level of nutritional support of tissues;

analgesic effect;

immunostimulating effect;

various organ and reflex-inducing influence on the functional activity of systems.

Local effects are determined by exudation, transformation and proliferation, which are the main elements of the inflammatory response. Exudation: vasodilation, activation of microcirculation with concomitant vasoconstriction - prevention of gradual microcirculation disorders, normalization of blood circulation in combination with normalization of vascular wall permeability (vascular-tissue barrier), reduction of tissue edema Under the influence of radiation, optimal formation of neutrophilic and monocytic barriers, microphages and macrophages, increased phagocytic activity, production of bactericidal and growth-stimulating substances stimulation of proliferation and activation of barrier properties of the oral mucosa. Changes: activation of the functions of mitochondria and other cellular organelles, metabolism due to increased oxygen consumption and tissue respiration. At the same time, anaerobic processes are inhibited, acidosis and secondary atrophic changes are prevented, and regeneration of damaged tissues is stimulated. Proliferation: stimulation of the DNA-RNA-protein system, increased cell division (proliferation) activity and activation of connective tissue reactions. Morphologically, the cellular response manifests itself in stimulating and enhancing the formation of the fibroblast barrier (against the background of the release of growth-stimulating substances), stimulating the formation of granulation tissue, stimulating the maturation of fibroblasts, activating the formation of collagen fibers and the maturation of granulation tissue. As a result, epithelialization of the mucous membrane at the site of the lesion is rapidly and physiologically accelerated and regeneration is fully stimulated. The therapeutic effect (stimulation) of the tissue regeneration process is expressed in the activation of the DNA-RNA-protein system, increased synthesis of nucleic acids and nuclear proteins, increased nuclear mass, increased synthesis of cytoplasmic proteins and their accumulation in the interphase to a critical level. Mitosis is stimulated, and the reproduction of connective tissue and epithelial cells is stimulated and increased. The impact is mainly: contact, contact-mirror, remote: 1. Local effects on wounds, injuries, burns and ulcers include both local and systemic effects of LILI. Greater stimulation of proliferation and microcirculation leads to a local anti-inflammatory and immunostimulating effect; 2. Effects on reflexogenic zones: acupuncture points such as firmans and auricles, Zakharyin-Ged zone, paraspinal zone; 3. Effects on projections of internal organs; 4. Effects on projections of vascular bundles; 5. Effects on projections of immunocompromised The regenerative, anti-inflammatory and immunostimulating effects of LILY are significant. The effective use of laser irradiation as a preventive measure significantly reduces the likelihood of postoperative complications. There is no data in the available literature on evaluating the effectiveness of this technique in patients with periodontal diseases.

A characteristic feature of laser treatment in periodontics is the active use of optical nozzles of the C-1 set. These nozzles were supposed to irradiate the lesion with laser radiation in the red region of the spectrum (0.63 microns) at the required optimal power density (7-10 MW), the irradiation time was 1.5-2 minutes. The pulse repetition rate was 80 Hz. The KLO3 laser irradiating head was used to irradiate the papillary and marginal gingival areas (along the field), capturing 1-2 cm of the mucous membrane of the alveolar process. The aim of the study is to increase the effectiveness of treatment of chronic generalized catarrhal gingivitis using low-intensity laser irradiation methods.

## **METHODS**

During one year, from January 2009 to January 2010, we examined and conducted comprehensive treatment of 64 patients with chronic generalized catarrhal gingivitis. The study was conducted on the basis of the UGMA dental clinic and included physically healthy patients aged 18-29 years, 26 men and 38 women. Patients complained of bleeding gums when brushing their teeth (38.74% of the examined), an unpleasant taste in the mouth (18.04%) and itchy gums (13.85%). The collection of anamnesis and the identification of errors in individual oral hygiene were of great importance. During the examination of the oral cavity, the condition of the mucous membrane of the maxillary and mandibular alveolar processes, occlusion were assessed, the dental CP index, the simplified Green-Vermillion oral hygiene index (OHI-S), the papillary-marginal-alveolar index (PMA) according to the modified Parma technique and the papillary gum bleeding index (PBI) were recorded. The evaluation of the vacuum resistance of the gum capillaries using the Kulazhenko method in the area of the mandibular central incisor was used as a functional research method. For the differential diagnosis of periodontitis, an orthopantomographic examination was used on an ORTHOPHOS 3 device (the average radiation dose was 36 mk Sievert). Comprehensive treatment of patients included training in proper dental cleaning and oral hygiene, selection of individual hygiene products (toothbrush, paste, dental floss), specialized oral hygiene, elimination of local irritants, filling of caries with restoration of contact points, the use of anti-inflammatory drugs, irrigation and bathing. The patients were randomly divided into two groups: the study group and the control group. After professional oral hygiene was carried out, laser treatment using an integrated technique was included in the comprehensive treatment plan for the study group of patients. KLO3 laser irradiating head, wavelength 0.63 microns, maximum power (7-10 MW), 1.5-2 minutes on the field. External percutaneous contact mirror effect on the upper and lower jaw was performed with an infrared laser head LO2 (LO3), pulse power 7-10 W, frequency 80 Hz, projection of the lesion area. The effectiveness of combined treatment was evaluated 7, 14, 1 and 3 days, 1 and 3

months after the start of treatment. Statistical processing of the obtained results was carried out using the Student's method.

## RESULTS AND DISCUSSION

During the initial examination of the oral cavity, congestive hyperemia, edema of the gingival papillae and marginal gum were revealed in 83% of patients, slight suppuration in 17%, bleeding and the presence of hard and soft dental deposits in 100% of patients. Abnormal bite and individual tooth position were detected in 35% of patients. The dental CPI index was  $6.72 \pm 0.94$  in the control group and  $7.16 \pm 1.31$  in the study group; the Green-Vermillion index was  $3.34 \pm 0.38$  in the control group and  $3.32 \pm 0.42$  in the study group (poor oral hygiene). The papillary-limbal-alveolar index was  $46.85 \pm 4.95\%$  in the control group and  $48.53 \pm 3.48\%$  in the study group (average gingivitis severity). The bleeding index was  $1.42 \pm 0.18$  in the control group and  $1.41 \pm 0.19$  in the study group. The average rate of hematoma formation was 14.8 seconds in the control group and 13.9 seconds in the study group. At the first visit, there were no statistically significant differences between the main and control groups according to objective data, index assessment and additional functional tests. A week after the start of combined treatment of patients with chronic generalized catarrhal gingivitis, 100% of patients experienced an improvement in subjective sensations. The effectiveness of treatment was noted in all patients of the control and study groups. Objective tests revealed a decrease in the phenomenon of periodontal ligament inflammation and a decrease or disappearance of dental deposits after professional oral hygiene. However, 62% of patients in the control group after professional oral hygiene showed the appearance of hypersensitivity of the teeth, that is, discomfort lasting from two to three days to a week. In the study group, 37% of patients presented such complaints. In general, the results of combined treatment of patients with chronic generalized catarrhal gingivitis in both groups can be assessed as satisfactory. Oral hygiene improved significantly in both groups 1 and 2. The Green-Vermilion index after treatment was  $0.62 \pm 0.09$  in the control group and  $0.53 \pm 0.07$  in the study group, which indicates good oral hygiene. The analysis of the data obtained indicates a steady improvement in index scores and functional tests in the first week after the start of combined treatment in both groups of patients. A comparison of patient indicators in the study and control groups shows that the PMA and PBI indices in the study group are significantly lower than in the control group at all follow-up periods, and the rate of hematoma formation during the vacuum test is 1.4 times (after 1 week) and 1.7 times (after 2 weeks) significantly lower than the intensity of Effective the anti-inflammatory effect of laser therapy, improvement of microcirculation and metabolic processes in periodontal tissues, indicates that the use of LILY improves blood circulation faster and has an anti-inflammatory effect. In the

absence of contraindications to concomitant procedures, the use of low-intensity laser therapy in the complex treatment of periodontal diseases is very useful for shortening the duration of treatment, rehabilitation of the patient and reducing patient discomfort during complex treatment.

## CONCLUSION

The results of this study indicate the effectiveness of low-intensity laser therapy in the complex treatment of chronic generalized catarrhal gingivitis.

## REFERENCE

1. Абдуллаева П. Р., Ахмедов А. А. СПОСОБ ЛЕЧЕНИЯ ИШЕМИЧЕСКИХ СОСТОЯНИЙ ЗРИТЕЛЬНОГО НЕРВА И СЕТЧАТКИ (ЛИТЕРАТУРНЫЙ ОБЗОР): Medical science //Ethiopian International Journal of Multidisciplinary Research. – 2023. – Т. 10. – №. 09. – С. 18-23.
2. Ризаев Ж. А., Ахмедов А. А. ОСНОВЫ СТОМАТОЛОГИЧЕСКОЙ ПОМОЩИ В РЕСПУБЛИКЕ УЗБЕКИСТАН НА ОСНОВЕ РАЗВИТИЯ ОБЩЕЙ ВРАЧЕБНОЙ ПРАКТИКИ //ЖУРНАЛ СТОМАТОЛОГИИ И КРАНИОФАЦИАЛЬНЫХ ИССЛЕДОВАНИЙ. – 2023. – Т. 4. – №. 3.
3. Абдуллаева Н. И., Ахмедов А. А. ОСТЕО-ИММУНОЛОГИЧЕСКИЙ СТАТУС ПАЦИЕНТОВ С ЗАБОЛЕВАНИЙ ПАРОДОНТА В ПОДРОСТКОВОМ И МОЛОДОМ ВОЗРАСТЕ //TA'LIM VA RIVOJLANISH TANLILI ONLAYN ILMIY JURNALI. – 2023. – Т. 3. – №. 11. – С. 143-149.
4. Ахмедов А. А. Иммунологические аспекты патогенеза гингивита и пародонтита //IQRO. – 2023. – Т. 3. – №. 2. – С. 121-123.
5. Ризаев Ж. А., Ахмедов А. А. GROWTH AND DEVELOPMENT OF GENERAL MEDICAL PRACTICE IN THE REPUBLIC OF UZBEKISTAN TO IMPROVE DENTAL CARE //ЖУРНАЛ СТОМАТОЛОГИИ И КРАНИОФАЦИАЛЬНЫХ ИССЛЕДОВАНИЙ. – 2023. – Т. 4. – №. 3.
6. Ахмедов А. А., Нарзиева Н. DENTAL PROSTHETICS ON IMPLANTS AND THEIR FEATURES //American Journal of Pedagogical and Educational Research. – 2023. – Т. 16. – С. 132-135.
7. Astanovich A. D. A. et al. The State of Periodontal Tissues in Athletes Engaged in Cyclic Sports //Annals of the Romanian Society for Cell Biology. – 2021. – С. 235-241.
8. Alimjanovich R. J., Astanovich A. A. СОВЕРШЕНСТВОВАНИЕ СТОМАТОЛОГИЧЕСКОЙ ПОМОЩИ В УЗБЕКИСТАНЕ С ИСПОЛЬЗОВАНИЕМ КОНЦЕПТУАЛЬНОГО ПОДХОДА ДЛЯ УЛУЧШЕНИЕ ЕЕ КАЧЕСТВА //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2023. – Т. 8. – №. 4.
9. Ортикова Н. Глобализация биоэтики в период пандемии COVID-19 //Общество и инновации. – 2020. – Т. 1. – №. 1/S. – С. 677-682.

- 10.**Ортикова Н. Влияние психоэмоционального напряжения детей на состояние здоровья полости рта //Общество и инновации. – 2023. – Т. 4. – №. 7/S. – С. 328-333.
- 11.**Ортикова Н. Х., Ризаев Ж. А., Мелибаев Б. А. ПСИХОЛОГИЧЕСКИЕ АСПЕКТЫ ПОСТРОЕНИЯ СТОМАТОЛОГИЧЕСКОГО ПРИЕМА ПАЦИЕНТОВ ДЕТСКОГО ВОЗРАСТА //EDITOR COORDINATOR. – 2021. – С. 554.
- 12.**Ортикова Н. Тенденция эффективности профилактических мероприятий путем коррекции психологического стресса у детей на стоматологическом приёме //Общество и инновации. – 2022. – Т. 3. – №. 6. – С. 181-189.
- 13.**Qobilovna B. Z., Nodirovich E. A. EVALUATION OF ORTHOPEDIC TREATMENT WITH REMOVABLE DENTAL PROSTHESES FOR PATIENTS WITH PAIR PATHOLOGY //Spectrum Journal of Innovation, Reforms and Development. – 2023. – Т. 11. – С. 95-101.
- 14.**Anvarovich E. S., Qobilovna B. Z. INFLUENCE OF DIFFERENT TYPES OF RETRACTION THREADS ON THE DEGREE OF GINGI RECESSION //Spectrum Journal of Innovation, Reforms and Development. – 2023. – Т. 11. – С. 84-86.
- 15.**Tohirovna M. L., Qobilovna B. Z. Optimization of Complex Methods Treatment of Inflammatory Periodontal Diseases //Eurasian Research Bulletin. – 2023. – Т. 17. – С. 138-143.
- 16.**Tavakalova Q. M., Qobilovna B. Z., Sarvinoz Y. Preventive Measures in the Treatment of Caries in School children //Eurasian Research Bulletin. – 2023. – Т. 17. – С. 60-65.
- 17.**Исламова Н., Чакконов Ф. Роль продуктов перекисного окисления липидов и противовоспалительных цитокинов крови в развитии заболеваний полости рта при гипотиреозе //Общество и инновации. – 2020. – Т. 1. – №. 1/s. – С. 577-582.
- 18.**Fakhriddin C., Shokhruh S., Nilufar I. ENDOKANAL PIN-KONSTRUKSIYALARNI ISHLATISHDA ASORATLAR VA XATOLAR TAHLILI //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2022. – Т. 7. – №. 1.
- 19.**Shoxrux S., Shoxrux I., Faxriddin C. PREVENTION AND TREATMENT OF ORAL INFECTIONS IN DENTURE WEARERS //International Journal of Early Childhood Special Education. – 2022. – Т. 14. – №. 4.
- 20.**Xusanovich C. F. COMPLETE REMOVABLE PROSTHESIS SUPPORTED BY IMPLANTS //European International Journal of Multidisciplinary Research and Management Studies. – 2023. – Т. 3. – №. 11. – С. 127-133.
- 21.**Xusanovich C. F. et al. PROSTHETICS A COMPLETE REMOVABLE PROSTHESIS BASED ON IMPLANTS //European International Journal of Multidisciplinary Research and Management Studies. – 2023. – Т. 3. – №. 11. – С. 122-126.

- 22.** Najmiddinovich S. N. et al. CARIES IN SCHOOL CHILDREN AND TREATMENT PREVENTIVE MEASURES //American Journal of Pedagogical and Educational Research. – 2023. – T. 16. – C. 44-49.
- 23.** Khusanovich K. B. R. C. F. TYPES AND APPLICATIONS OF DENTAL COMPLIMENTS //Journal of Modern Educational Achievements. – 2023. – T. 5. – №. 5. – C. 95-99.
- 24.** Zarnigor J. MAIN ROLE OF HYGIENIC EDUCATION IN THE SYSTEM PRIMARY PREVENTION OF DENTAL DISEASES OF PATIENT //European International Journal of Multidisciplinary Research and Management Studies. – 2023. – T. 3. – №. 11. – C. 157-163.
- 25.** Qizi J. Z. B. METHODS OF OPTIMIZATION OF TREATMENT OF PERIODONTAL DISEASES USING NEW TECHNOLOGIES //European International Journal of Multidisciplinary Research and Management Studies. – 2023. – T. 3. – №. 10. – C. 234-241.
- 26.** Kobilovna B. Z., Rushana R. COMPARATIVE EVALUATION OF PARTIAL DENTURES WITH VARIOUS FASTENING ELEMENTS //Intent Research Scientific Journal. – 2023. – T. 2. – №. 9. – C. 98-103.
- 27.** Qobilovna B. Z., Maxzuna U. Improvement of Providing Therapeutic Dental Care to Pregnant Women. Therapeutic and Preventive Measures //Eurasian Research Bulletin. – 2023. – T. 16. – C. 146-150.
- 28.** Tavakalova Q. M., Qobilovna B. Z., Sarvinoz Y. Results of the Prevention Program Dental Diseases in School-Age Children //Eurasian Research Bulletin. – 2023. – T. 17. – C. 50-54
- 29.** Jurabek T. D., Qobilovna B. Z. Principles of Prevention of Dental Diseases in Children in Modern Conditions //Eurasian Research Bulletin. – 2023. – T. 17. – C. 55-59.
- 30.** Tavakalova Q. M., Qobilovna B. Z., Sarvinoz Y. Preventive Measures in the Treatment of Caries in School children //Eurasian Research Bulletin. – 2023. – T. 17. – C. 60-65