

# The Use Of Various Techniques In The Treatment Of Traumatic Injuries Of The Oral Mucosa In Children

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*Abstract: Dental diseases in children, such as carious lesions of deciduous teeth, traumatic injuries of the oral cavity occupy one of the first places among chronic diseases. A feature of the oral cavity in children is that with any traumatic injury, the mucous membrane instantly becomes infected. Separate use of techniques such as infrared radiation - a spectrum of electromagnetic waves, laser treatment, ultraviolet rays for traumatic injuries of the oral cavity did not always give the expected effect. The study of the effect of the apparatus of magnetic-infrared-laser therapy (MIL-T) "Sogdiana" in children with traumatic injuries of the oral cavity, was more effective than traditional therapy.*

*Key words: structural features of the mucous membrane, magnetic-infrared laser apparatus, traumatic injuries of the oral cavity in children.*

## 1. INTRODUCTION

In childhood, mechanical and chemical injuries are more often occur. Depending on the duration of the injury, its intensity and the reactivity of the body, hyperemia of the damaged area, its edema, desquamation of the epithelium, erosion or ulceration of the mucous membrane may occur.

Many authors report an increase in dental morbidity in children, and not cured carious lesions of deciduous teeth occupy 10th place among all chronic diseases of the population. There is an increase in the prevalence of early childhood caries, accompanied by a large number of complications and an increase in the need for dental care among children [10, 11, 12].

Age characteristics play a large role in the occurrence and course of traumatic oral cavity injuries (TMP) in children. So, in newborns, there is a low differentiation of the epithelium and connective tissue, the epithelial cover is thin and consists of only two layers of cells, the basement membrane in all parts of the oral cavity is thin and delicate. In the early childhood period, regional differences are formed, however, the fibers of the own layer of the mucous membrane are loosely located and have a thin and delicate structure. These structural features undoubtedly cause increased vulnerability of the oral mucosa in children.

In schoolchildren, the maturity of collagen fibers increases, the number of protein structures in the epithelial layer increases, the mucous membrane becomes denser and more resistant to traumatic effects. However, during puberty, the changes occurring under the influence of hormonal regulation factors increase, which entails an increased response to chronic trauma with a pronounced vascular component [1]. The impact of any traumatic agent on the mucous membrane is accompanied by certain clinical manifestations [1-4,7,8]. Traumatic exposure reduces the barrier function of the mucous membrane, which becomes the entrance gate of infection for the introduction of microorganisms and the development of inflammation [2].

When studying the literature data, we found that there are few data on the prevalence of traumatic injuries of a mechanical nature [9]. There are several varieties of mechanical therapies for treating children. This is the use of electromagnetic oscillations - infrared radiation, Minin lamps, sollux lamps, a method of treatment using ultraviolet radiation.

*Phototherapy* - is the therapeutic application of electromagnetic waves in the optical range, including infrared, visible and ultraviolet (UV) radiation. Light is a form of matter that has both the properties of particles and waves. The wave properties of light appear when it is recognized and the phenomena of reflection, refraction, diffraction, interference, polarization are associated with them.

The influence of light on life processes was noticed even in ancient times. This is how heliotherapy was born - a treatment with natural sunlight. The development of science and technology has led to the creation of artificial light sources. In 1876, the Russian scientist P.N. Yablochkov invented an electric arc lamp, which later found application in light therapy.

The energy of quanta of optical radiation determines the nature of the primary photo biological reactions. In the infrared region, the energy of photons is sufficient only to increase the energy of the vibrational processes of biological molecules. Visible radiation can cause their electronic excitation and photolytic dissociation. Ultraviolet radiation quanta cause ionization of molecules and the destruction of covalent bonds. Then the energy of optical radiation is converted into heat or primary photoproducts are formed, which are the triggering mechanism of photo biological processes.

*Infrared radiation* - is a spectrum of electromagnetic waves with a wavelength from 400 microns to 760 nm. These rays are absorbed by tissues at a depth of 1 cm. Longer infrared rays penetrate 2-3 cm deeper.

Since the energy of infrared rays is relatively low, when they are absorbed, there is mainly an increase in the vibrational and rotational movements of molecules and atoms. All this primarily leads to the formation of heat.

Thermal energy significantly accelerates metabolic processes in the irradiated tissues. Activation of the microcirculatory bed and increased vascular permeability contribute to the removal of the products of cell autolysis from it. Some of the fluid to be perfused is released with sweat and evaporates. Infrared radiation stimulates the processes of reparative regeneration in the focus of inflammation and can be most effectively used for treatment in the final stages of the inflammatory process.

## 2. EQUIPMENT

Incandescent lamps are the most common source of infrared radiation. The temperature of the filament in them reaches 2800 - 3600 ° C. Small amounts of ultraviolet rays emitted by them are almost completely absorbed by the glass of the lamp.

Minin lamp (Figure 1) consists of a parabolic reflector with a wooden handle, which accommodates a radiator with a power of 25 - 40 watts. A blue lamp is often used. The simplicity and portability of the device allows it to be used at home. The distance is adjusted according to the sensation of pleasant warmth on the affected area, 15 - 30 cm from the patient. Duration 15 - 20 minutes daily. Course 10 - 15 procedures.

The Sollux lamp (Figure 2) is a much more powerful source of radiation with a power of 200 - 500 W. The lamp is enclosed in a parabolic reflector with a removable tube, mounted on a stationary or portable tripod. The irradiator is installed at a distance of 40 - 80 cm from the patient's body surface. The duration of the procedure is 15 - 30 minutes daily or every other day. There are 10 - 15 procedures per course.



*Figure 1. Lamp Minin*



*Figure 8. Lamp Sollux*

#### UV treatment

*Ultraviolet radiation* - is a method of treatment using ultraviolet radiation.

The mechanism of action of ultraviolet rays is due to the ability of atoms and molecules to selectively absorb light energy. The molecule can be in this state for a very long time. The excess energy released in this case causes a variety of processes. Certain photochemical and photo biological reactions take place in the skin: the destruction of protein molecules (photolysis), the formation of more complex biological molecules (photo biosynthesis) with new physicochemical properties (photo isomerization), as well as the formation of bio radicals. Depending on the wavelength, the UV spectrum is conventionally divided into three zones:

(400-320 nm) - long-wave (LUV) radiation;

(320-280 nm) - medium-wave (MUF) radiation;

(280-180 nm) - short-wave (SUV) radiation;

The highest penetrating power is possessed by UV-radiation (up to 1 mm). In terms of energy, SUV rays are superior to other types of radiation.

DNA and RNA of protein molecules are most sensitive to UV radiation. As a result of photolysis, biologically active substances (acetylcholine, histamine, prostaglandins) are released. The activity of enzymes also increases: peroxidase, histaminase, tyrosinase, etc. As a result of

these processes, there is a change in the vital activity of the organs and systems of the body, the stimulation of its defense mechanisms and the function of the endocrine glands.

Under the influence of ultraviolet rays, redox processes are activated in tissues, photo isomerization processes appear and intensify, as a result of which vitamin D is formed, and pigmentation processes are stimulated.

Large doses of UV rays reduce the tone of the sympathetic part of the autonomic nervous system, while small doses stimulate the sympathoadrenal system, the pituitary gland, the function of the adrenal cortex, thyroid and gonads.

*Laser therapy* is the therapeutic application of low-energy laser radiation. The effect of low-intensity lasers leads to a rapid abatement of acute inflammation, stimulates reparative (restorative) processes, improves tissue microcirculation, normalizes general immunity, and increases the body's resistance (stability).

*Laser radiation* is a non-specific biostimulator of reparative and metabolic processes in various tissues. Accelerates wound healing, while exerting a bacteriostatic effect against causative agents of wound infection, improves the regeneration of nerve and bone tissue. Has a pronounced anti-inflammatory effect. It has a stimulating effect on cellular and humoral immunity. With bacterial contamination of the wound surface and with an exacerbation of a chronic inflammatory process, it is more advisable to use an ultraviolet laser.

### 3. EQUIPMENT

To obtain monochromatic rays, such devices as “Pattern – 1”, “Pattern – 2”, “Lazurit”, “Raskos”, “RIKTA” are currently used. Figure 4



**Figure 4 Appearance of the “Rikta” apparatus**

The urgency of this problem is due to the rather high level of injuries in children. The development of the use of magnetic infrared laser therapy is promising. However, many fundamental aspects of the treatment of traumatic lesions manifesting themselves on the oral mucosa have not been fully resolved. When studying the data, we found that there are few data on the prevalence of such injuries, but the degree of injury in children is nevertheless high. Therefore, further search and development of new, gentle and at the same time effective means for the treatment of traumatic lesions of the oral mucosa remains an urgent task. Laser therapy can significantly reduce the dose of prescribed pharmacological drugs, and sometimes even avoid taking drugs with unwanted side effects [5,6].

A non-drug, anti-relapse method of treating traumatic injuries of the oral cavity using a magnetic infrared laser therapy apparatus, included in the complex of etiopatho-genetic, therapeutic measures, is especially relevant [3].

The pulsating broadband red radiation of semiconductor LEDs, penetrating to a shallow depth, has an antibacterial effect, reducing the intensity of inflammatory processes. The red light visualizes the treatment area and has a weak local warming and beneficial psychothera-

peutic effect. Laser radiation has monochromaticity, spatial and temporal coherence and polarization, and due to these properties it has a powerful stimulating effect on blood circulation, membrane cell metabolism, activates neurohumoral factors, immune-competent systems, harmonizes hormonal factors of metabolism [13,14,15] ...



All of the above physiotherapeutic, therapeutic and prophylactic effects of polyfactorial effects were included in the apparatus of magnetic-infrared-laser therapy “Sogdiana”. The device MIL-T “Sogdiana” improves the harmonization of the biochemical composition of blood and its aggregate state, tissue regeneration, enhancement of collagen synthesis, anti-inflammatory, anti-edema and analgesic effects, stimulates the immune system, has a powerful antioxidant effect in this disease [14]. Thus, treatment with the device MIL-T “Sogdiana” is recommended for children with traumatic injuries of the oral cavity.

#### 4. CONCLUSIONS

1. The main effect of the apparatus “Sogdiana” on membrane cellular metabolism, activates neurohumoral factors, harmonizes hormonal factors.
2. When using the device MIL-T “Sogdiana”, a rapid onset of complete epithelialization, a decrease in the frequency and severity of relapses, as well as an increase in the duration of remission.
3. The device MIL-T “Sogdiana” improves the harmonization of the biochemical composition of the blood and its aggregate state, tissue regeneration, anti-edema and analgesic effects, stimulates the immune system, has a powerful antioxidant effect in traumatic lesions of the oral cavity.

#### 5. REFERENCES

- [1] 1. Buligina V.M. Dynamics of changes in the immunological indicators of the oral age in the process of treatment of ailments due to chronic mechanical trauma of the mucous membrane of the empty mouth / V.M. Kuligina, M.A.Goray // Modern dentistry. - 2010. - No. 4 (53) - S. 72–77.
- [2] 2. Zakirov T.V., Pyriev A.A. “Features of trauma of the oral mucosa in children” Problems of dentistry, 2015, V. 11 No. 5. P. 32-36.
- [3] 3. Kamalova M.K. Possibilities of using MIL - therapy in the treatment of chronic recurrent herpetic stomatitis in children. Journal of Biomedicine and Practice, 2018, vol. 1, issue 3, pp. 30–35. <http://dx.doi.org/10.26739/2181-9300-2018-30-35>

- [4] 4. Moskvina S.V. Nasedkin A.N., Osin A.Ya., Khan M.A. "Laser therapy in pediatrics." Moscow 2009. 6-7.
- [5] 5. Prokhorova E.V., V.V. Gemonov, P.A. Druzhinin, I.V. Abramova, Volozhin A.I. Influence of infrared irradiation by the "Svetovid" apparatus on the course of experimental periodontitis in immunodeficiency states. // Russian dental journal. - 2007. - No. 4 - P.10-13.
- [6] 6. Прохорова Е., Гилева Ю., Климова Т., Русанова А., Воложин А. Лечебный эффект инфракрасного излучения у пациентов с non-removable orthodontic structures, chronic gingivitis. // Cathedra. - 2007, Vol.6- No.4- S. 40-44.
- [7] 7. Rusanova A. G., Prokhorova E. V., Klimova T. V. Influence of infrared radiation on the blood flow of the gums is normal. // Actual problems of dentistry Materials of the All-Russian scientific-practical conference dedicated to the 105th anniversary of the birth of Professor Efim Efimovich Platonov M, 2006.-P 150.
- [8] 8. Rusanova A.G., Prokhorova E.V., Klimova T.V. Influence of infrared radiation in patients with non-removable orthodontic construction, the course of chronic gingivitis // Proceedings of the VIII International Congress of Health and Education in the XXI century, the concept of diseases of civilization RUDN-2007-S 516-517.
- [9] 9. Chijevsky I.V., Ermakova I.D., Zabyshny A.A., Jurba O.O. Mechanical traumatic injuries of the mucous membrane of the oral cavity in children of early and preschool age // Collection of articles, 2013, issue 17, VOL. 2, p. 325-328.
- [10] 10. Kamalova M.K. (2019). Prevention and treatment of dental caries optimization in preschool children. Digest of articles. Science, Research, development. – P.72-74
- [11] 11.Kamalova M.K. Raximov Z.K. (2019). Clinical and economic rationale for the organization of dental care for preschool children New Day in Medicine, Enlightenment and Spiritual journal. – No. 4 (28). 268-271
- [12] 12.Maslak E. et al. (2019). The patient and the dentist. Trust and consent to treatment. Journal of International Pharmaceutical Research. – Vol. 46. – No.1. - P. 613-621.
- [13] 13. Naumovich, S. A., Kuvshinov, A. V., Dmitrochenko, A. P., Dosta, A. N., & Pashuk, A. P. (2006). Application of laser technologies in dentistry, Modern dentistry (1), 4-13.
- [14] 14. Guidelines for the use of a magneto-infrared laser quantum therapy apparatus "SOGDIANA" (2001). Tashkent.
- [15] 15. Pershin, S. V. (2013). Experience in the use of low-intensity laser radiation (LIL) of the infrared range in the treatment of diseases of the oral mucosa in children (17, T. 2), 285-290.