

INTRAVASCULAR LASER IRRADIATION OF BLOOD IN INFLAMMATORY AND ALLERGIC DISEASES OF THE NOSE AND SINUS

Mahbuda S. Muhamedova¹, Jamol I. Kholmatov², H. H. Urunov¹

¹ “Shifo” Diagnostic and Medical Center

² Department of Otorhinolaryngology of the Tajik Medical University of the name Abuali ibni Sino

Corresponding author: Jamol I. Kholmatov, Department of otorhinolaryngology of the Tajik Medical University of the name Abuali ibni Sino, e-mail: Kholmatovji@mail.ru

The examination and complex treatment with application of intravascular laser irradiation of blood (ILIB) in patients with inflammatory and allergic diseases of the nose and sinus was conducted. As a result blood circulation in the damaged and areas improved and additionally anaesthetizing effect was experienced.

Abstract

The method of laser therapy of various inflammatory diseases has been applied widely in medical practice. It provides anti-inflammatory and analgesic effects. In the present study laser radiation of a red spectrum in a pulse mode was used for treatment. As a result 95% of patients with allergic rhinitis did not show any signs of complicated *nasal* respiration, attacks of sneezing, *plentiful allocation* of the *mucous* secret, and at 98% of patients with rhinosinusitis purulent discharges in nose, morbidity in paranasal sinuses, headaches have disappeared. The rhinoscopic picture of the examined patients was characterised by that the mucosa has obtained pink colour, nasal conchas considerably reduced and by that nasal breath has improved.

Thus, the authors came to a conclusion that laser application in complex treatment of patients with allergic rhinitis and rhinosinusitis allows to receive high medical and economic efficiency, the method has anaesthetising effect and by the increase of $\dot{V}O_2$ -transport function of blood, blood circulation in the damaged sites and the impoverished zones of all organism improves.

Background

The number of upper respiratory diseases, in particular of nose and sinus, tends to increase due to ecology deterioration, allergic diseases, on one hand, and growth of the amount of antibacterial remedies, histamine antagonists and their extensive application, on the other hand [2,3,7].

Recently the method of laser therapy of various inflammatory diseases has been applied widely in medical practice [1,4–6,9]. Results provided evidence of effect of low-energy laser radiation on a current inflammatory and regeneration processes in tissues [4–8]. Anti-inflammatory and analgesic effects are believed to be due to the fact that low-energy laser radiation has vasodilating effect, improves microcirculation in tissue, and also influences nonspecific organism protection factors – immune and phagocyte systems. Low-energy laser radiation also reduces reproductive function of pathogenic microflora [1,4,9].

The purpose of the study was examination and complex treatment of patients with inflammatory and allergic diseases of the nose and sinus with application of intravascular laser irradiation of blood (ILIB).

Material and method

During 2004–2010 employees of “Shifo” diagnostic and medical center gathered a sufficient clinical material on application of the laser therapy method in treatment of

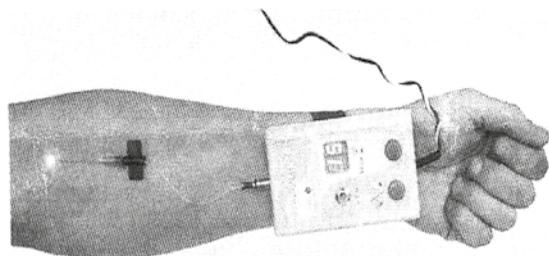
patients with pulmonary pathology, with gynecological diseases, including patients with allergic rhinitis and acute sinusitis.

For the first time in ENT practice of Tajikistan red laser radiation in a pulsed mode (630 nm) has been used and its clinical advantage from radiation of the same length wave, but continuous action has been presented.

In total 160 patients were surveyed, 100 of which had allergic rhinitis, 60 – inflammation of sinus. All patients have passed general clinical examination (properties of blood, urine, feces tests, radiography of paranasal sinuses, electrocardiogram, etc.) and the general otorhinolaryngological survey before the treatment. At anterior rhinoscopy the nasal cavity mucosa was pale blue and hydropic, part of the patients had symptoms of mucous hyperemia, swelling of the inferior and middle nasal conchas, 11% of the surveyed patients had the curvature of a nasal septum in its cartilaginous part which did not interfere with free nasal respiration. The rhinoscopic image of patients with rhinosinusitis was characterized by hyperemia and edema of the nasal cavity mucosa, a mucopurulent discharge in the area of right or left middle nasal conchas depending on localization of purulent process. Roentgenography of patients with a genyantritis showed decrease of lightness of genyantrums because of the parietal or total absence of the air transparency.

In “Shifo” diagnostic and medical center the ILIB procedure is conducted by puncturing antecubital veins in

aseptic conditions. ILIB is performed daily using an "Azor" apparatus. Light guide "KIVL-02" with wavelength 630 nm and radiation output power from 1.5 to 2.5 MW is exposed for 20 to 45 minutes into the vein of a patient. Course of treatment includes from 5 to 10 sessions daily. A repeated course was given to the patients with allergic rhinitis for 3 months.



It is necessary to point out that besides ILIB the patients were given traditional anti-inflammatory and anti-allergic treatment which included desensitizing and vasoconstrictive preparations.

Results

After examination and course of treatment with application of ILIB method 95% of patients with allergic rhinitis did not show any signs of complicated nasal respiration, attacks of sneezing, plentiful allocation of the mucous secret, and in 98% of patients with rhinosinusitis purulent discharges in nose, morbidity in paranasal sinuses, headaches have disappeared. The rhinoscopic image of the examined patients was characterized by patients' mucosa which obtained pink colour, nasal conchas that became considerably reduced and by the improvement of nasal breathing. Blood results before the treatment were the following: eosinophilia before the application of "ILIB" was $9 \pm 0.5\%$, lymphocytosis of $36 \pm 0.5\%$; LII (leukocytic index

of intoxication) up to $1.8 + 0.5\%$; Paramecium Test from 8 to 12 minutes (N 25–30 minutes).

After application of ILIB completed by with traditional anti-inflammatory and anti-histamine therapy following changes in blood results were obtained: eosinocytes in blood $1.8 + 0.5\%$; lymphocytes within $26 + 0.5\%$; LII – 1.0% ; Paramecium Test 25–28 minutes. Thus, it is established that as a result of intravenous laserotherapy vessels extended, speed of blood flow was improved, and quantity of vascular units (collaterals) were enlarged. It can be observed through blood circulation improvement in the damaged and impoverished areas (a mucosa of nose and sinuses, pharynx, etc.). Also metabolism and reproduction of cells are stimulated, which enhances healing process and regeneration of tissues both in normal and damaged conditions. ILIB improves elasticity of erythrocytes, stimulates functions of leucocytes – phagocytosis (absorption of microbes), development of protective antibodies. Blood becomes more liquid, fluid, better circulates through narrowed blood vessels. It is caused by decrease of blood coagulation properties, reduction of thrombogenesis and deformability of blood cells, improvement of their elasticity. The anti-allergenic effect, cholesterol decrease in blood becomes perceptible. During ILIB all factors of immunity are activated: reproduction of cells of adenoid tissue (tonsil) amplifies, the phagocytosis, development of interferon and antibodies are activated.

Conclusions

1. Results of examination and complex treatment with application of ILIB in patients with allergic rhinitis and rhinosinusitis have shown medical and economic efficiency of the conducted therapy.
2. As a result of increase of sensitivity threshold of painful receptors, anaesthetizing effect was experienced.
3. Thanks to increase of $\dot{I}2$ -transport function of blood, blood circulation in the damaged and impoverished areas improved.

References:

1. Bujlin VA, Nasedkin AN: Low-intense laser therapy in otorhinolaryngology. For the aid to practical doctor. Laser therapy. LLP firm "NĹĹNIŹŹ", 2000
2. Gjukan AO: Allergic rhinosinusitis: Autoabstract of dissertation by candidate of medical sciences. 1980; 20
3. Lantsov AA, Ryazantsev SV: Medicamentous treatment of allergic rhinitis. Materials of the conference devoted to the fifth anniversary of the Russian society of Rhinologists. 1997; 18–23
4. Lapchenco AS: Retrospective and possibilities of application of low-energy laser radiation in otorhinolaryngology. Otorhinolaryngology bulletin, 2002; 4: 51–54
5. Lapchenco AS, Kucherov AG: The use of laser radiation at otorhinolaryngological patients// Otorhinolaryngology bulletin. 2006; 5: 52–55
6. Palchun VT et al: Intravascular laser irradiation of blood at treatment of sensorineural hearing loss and Monera disease. Otorhinolaryngology bulletin, 1996; 6: 23–25
7. Piskunov GZ, Piskunov SZ: Clinical rhinology. 2006; 225
8. Piskunov GZ, Piskunov SZ, Kozlov VC, Lopatin AS: Diseases of nose and sinuses. Endo microsurgery. 2003; 202
9. El-Batanouny M: Some effects and mechanisms in laser tissue biostimulation. J Laser medicine, 2004; 8(3): 192