

## Respiratory

[Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2009 Mar-Apr;(2):19-22.

### **[Low-intensity laser radiation in the combined treatment of patients with chronic obstructive bronchitis]**

[Article in Russian]

[Kashanskaia EP](#), [Fedorov AA](#).

This study included 89 patients with chronic obstructive bronchitis (COB) that were exposed to harmful occupational factors. The control group consisted of 30 healthy subjects. Chronic obstructive bronchitis is characterized by serious disturbances in the cardiorespiratory system that manifest themselves in the form of bronchogenic pneumosclerosis with moderate lung emphysema and pulmonary hypertension associated with impaired general resistance. Simultaneously, activity of lipid peroxidation reactions decreases. Application of low-intensity laser radiation in combination with other therapeutic modalities for the treatment of patients with chronic obstructive bronchitis accelerates elimination of clinical symptoms, increases its efficiency, promotes drainage function of the bronchi, facilitates normalization of the patient's immune status, and contributes to the optimization of lipid peroxidation processes.

[Lik Sprava.](#) 2007 Apr-May;(3):42-6.

### **[Patients with tuberculosis associated with chronic non-specific lung diseases]**

[Article in Ukrainian]

[Nikolaieva OD](#).

159 patients have been observed to assess the efficiency of laseropuncture use in a complex treatment of patients with lung tuberculosis and chronic bronchitis. Disbalance in renal meridian (R), urinary bladder (V) and insufficiency of the energy in colon meridian (60.3%) were observed in patients with tuberculosis associated with chronic bronchitis. Medium deviations of electro-skin conductivity from the physiological gape in meridians of GI, IG, F, V, R in patients with tuberculosis associated with chronic bronchitis considerably differ from those data obtained from patients with only tuberculosis. Obtained data testify more severe disorders of energy balance in meridians of patients having except tuberculosis other associated diseases. Medium parameters of deviations from the physiological gape considerably decrease after the course of

laseropuncture compared with those patients treated traditionally. Improve of the course of the chronic bronchitis was noted in patients who underwent laseropuncture.

EMLA Laser Health J 2007;2:46-67  
European Medical Laser Association (EMLA)

### **Treatment of asthma and allergic rhinitis with low level laser and singulair in children**

C. Ailioaie 1,3, L-M. Ailioaie 2,3, D.A. Chiran 1,3

1. University of Medicine and Pharmacy, Faculty of Medicine, Iassy, Romania
2. "Al. I. Cuza" University, Dept. of Medical Physics, Iassy, Romania
3. Laser Clinic, Iossy, Romania

112 patients aged 9-18 years, with asthma and allergic rhinitis, were divided into 3 groups. Group 1 received laser therapy, as follows: acupoints (0.3 J/point), scanning technique (2 J/cm<sup>2</sup>), local regional ganglions (3 J/cm<sup>2</sup>), nose and oral mucous membranes (0.4 J/cm<sup>2</sup>) (670 and 830 nm, 25 mW -300 mW, CW and pulsed mode), three times/weekly, 12 days/monthly, during 3 months, together with classically drugs and 10 mg Singulair once daily. Group 2 was administrated placebo laser and Singulair, following the same protocol. Group 3 was treated only with classically drugs.

Low level laser therapy (LLLT) and Singulair have significantly reduced the symptoms, the duration and the dose of the corticosteroids, and have prolonged the disease remission better than other modality trials with side effects.

LLLT and Singulair improved the lung function and the quality of life in asthmatic patients with allergic rhinitis, too.

[Probl Tuberk Bolezn Legk.](#) 2007;(8):50-3.

### **[Efficiency of a combination of haloaerosols and helium-neon laser in the multimodality treatment of patients with bronchial asthma]**

[Article in Russian]

[Faradzheva NA.](#)

A hundred and thirty-eight patients with infection-dependent bronchial asthma, including 73 with moderate persistent asthma and 65 with severe persistent one, were examined. Four modes of a combination of traditional (drug) therapy (DT) and untraditional (halotherapy (HT) and endobronchial helium-neon laser irradiation (ELI) one were used. The efficiency of the treatment performed was evaluated, by determining the time course

of clinical symptoms of the disease on the basis of scores of their magnitude and the patients' condition. The findings indicated that in moderate persistent asthma, both HT and ELI in combination with DT exerted an equal therapeutic effect, which provided a good and excellent condition in 83.3% of cases. In severe persistent asthma, such a condition was achieved in 93.75% of cases only when multimodality treatment involving DT, HT, and ELI had been performed.

[Ter Arkh.](#) 2007;79(3):44-8.

## **[Intravascular laser irradiation of blood in the treatment of patients with bronchial asthma]**

[Farkhutdinov UR.](#)

AIM: To investigate action of intravascular laser blood irradiation (ILBI) on production of active oxygen forms (AOF) in patients with bronchial asthma (BA). MATERIAL AND METHODS: The trial included 59 BA patients aged 20 to 60 years (mean age 40.2 +/- 3.1 years). AOF generation in whole blood was registered with luminol-dependent chemiluminescence (CL). Basic therapy was given to 42 patients. ILBI was added to basic therapy in 17 patients. RESULT: CL of whole blood in BA patients depended on severity of inflammation. BA patients with intensive CL exposed to ILBI retained free radical oxidation defects and the disease symptoms. In low intensity of blood CL, ILBI activated A OF generation and raised treatment effectiveness. CONCLUSION: ILBI raises AOF production in the whole blood of BA patients. CL registration can be used for validation of ILBI administration in BA patients and control of

[Ter Arkh.](#) 2006;78(3):39-40.

## **[Clinical efficacy of target low-intensity laser radiation on the adrenal projection region in patients with bronchial asthma]**

[Article in Russian]

[Nikitin AV, Titova LA.](#)

AIM: To study efficacy of infrared laser radiation on the adrenal projection region in patients with bronchial asthma (BA). MATERIAL AND METHODS: The adrenal region of BA patients was exposed to infrared laser radiation. The effect was stated after blood count, examination of the urine and sputum, blood biochemical tests, blood hydrocortisone assay. RESULTS: Positive clinical response to laser therapy manifested with improvement of clinical, device and spirometric indices in BA patients. Blood levels of hydrocortisone normalized. CONCLUSION: Infrared laser radiation of adrenal projection region reduced the number of asphyxia attacks, improved bronchial drainage,

shortened the disease duration. The method is well tolerated, safe, easy to make and suggested for use in combined treatment of BA.

[Ter Arkh.](#) 2006;78(3):41-4.

## **[Outpatient use of laser therapy in bronchial asthma]**

[Article in Russian]

[Ostronosova NS.](#)

AIM: To analyse effects of outpatient laser therapy on the course of different forms of bronchial asthma (BA). MATERIAL AND METHODS: The examination has covered 466 patients with BA divided into three groups: group 1 patients received monotherapy with low-intensive laser radiation (LILR); group 2 - LILR plus conventional drug therapy (CDT); group 3 - CDT only. RESULTS: Group 1 and 2 patients achieved improvement after 2-3 sessions. Asphyxia attacks were less frequent and severe. These attacks disappeared to session 7-10, 10-12 in patients with exogenic, endogenic and mild, moderate mixed BA, respectively. The patients recovered sensitivity to sympathomimetics and methylxantines. Glucocorticosteroids (GCS) doses, hospital stay and temporary disability duration decreased. These two groups achieved remission within 0.5-1 year in 50% patients. Remission for 1-2 years was observed in 40% patients while in group. 3 - in 14%. CONCLUSION: The addition of laser therapy improves a BA course, results of outpatient treatment and rehabilitation, recovers bronchial sensitivity to sympathomimetics and xantine derivatives, reduces GCS dose and duration of hospital stay and disability in BA patients.

[Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2006 Mar-Apr;(2):8-10.

## **[Low-intensity laser radiation in therapy of bronchial asthma]**

[Article in Russian]

[Ostronosova NS.](#)

Efficacy of low-intensity laser radiation (LR) was studied by changes in a histamine level in peripheral blood and external respiration function (ERF). A total of 228 patients with exogenic bronchial asthma (EBA) were divided into two groups: 167 patients with nonhormone dependent asthma (group 1) and 61 patients with hormone-dependent bronchial asthma (group 2). Low-intensity LR lowered a histamine level and improved ERF in both group 1 and 2. A definite negative correlation was found between histamine content and ERF parameters. Laser therapy alone is effective in mild EBA. For moderate and severe EBA and hormone-dependent bronchial asthma a combination of conventional drug therapy with low-intensity LR is recommended.

## **[Efficacy of noninvasive hemolaserotherapy in patients with bronchial asthma and concomitant rhinosinusitis]**

[Article in Russian]

[Nikitin AV](#), [Treshchalina IuB](#).

AIM: To study efficacy of low-intensive infrared laser radiation impact on the tympanic membrane in patients with bronchial asthma (BA) and concomitant rhinosinusitis (RS). MATERIAL AND METHODS: 78 patients with moderate BA of a mixed type and concomitant chronic RS were divided into 3 groups: group 1 patients received medication plus infrared laser radiation of the tympanic membrane and paranasal sinuses; group 2 patients were exposed to supravenuous laser radiation (0.63 mcm); group 3 received pharmacotherapy alone. The effect of the treatment was assessed by spirometry, peakflowmetry and paranasal sinuses findings. RESULTS: The highest response was achieved in group 1 which manifested with positive changes in clinical, device and spirometric data on BA and x-ray data on RS courses. The least effective treatment was observed in group 3. CONCLUSION: Use of infrared laser radiation of the tympanic membrane and paranasal sinuses projection in the treatment of BA patients with RS is effective, nontoxic and easy to use both in hospitals and outpatient departments.

Med Pregl. 2003 Sep-Oct;56(9-10):413-8.

## **[Low power laser biostimulation in the treatment of bronchial asthma]**

[Article in Serbian]

**Milojevic M, Kuruc V.**

Institut za plucne bolesti, Sremska Kamenica, Medicinski fakultet, Novi Sad.  
drmilojevic@yahoo.com

INTRODUCTION: Modern concept of acupuncture is based on the fact there are designated locations on the surface of human body, which are related to integrative systems of an organism by means of sensory nerves, correlating and synchronizing organ functioning, depending on external and internal conditions, by means of nervous and neurohumoral regulation of metabolic and regenerative processes, including also mobilisation of immunological, protective and antistress reactions. Apart from standard needle acupuncture, other methods of stimulating acupuncture points are also applied. Due to invention of low power lasers, irradiation laser acupuncture has been introduced into routine medical practice, characterised by painless and aseptic technique and outstanding clinical results. MATERIAL AND METHODS: The investigation was

aimed at defining therapeutic effects of low power laser irradiation by stimulating acupuncture points or local treatment of asthma. A prospective analysis included 50 patients treated at the Institute of Pulmonary Diseases in Sremska Kamenica during 2000, 2001 and 2002. Together with conservative treatment of present disease, these patients were treated with laser stimulation of acupuncture points in duration of ten days. During treatment changes of functional respiratory parameters were recorded. Results were compared with those in the control group. The control group consisted of the same number of patients and differed from the examination group only by not using laser stimulation. RESULTS: Patients with bronchial asthma presented with significant improvement ( $p < 0.0005$ ) of all estimated lung function parameters just 30 minutes after laser stimulation. Improvements achieved on the third and the tenth day of treatment were significantly higher ( $p < 0.001$  to  $p < 0.00005$ ) in the examination group in comparison with the control group. Further investigation confirmed that improvement of measured lung function parameters was significantly higher in younger patients, in patients whose disease lasted shorter, as well as in women. Patients with asthma, who were treated every three months for a one year period, presented with significantly lower frequency and intensity of attacks. DISCUSSION: The mechanism of laser stimulation activity in treatment of bronchial asthma is explained in detail, correlating our results to those obtained by other authors. CONCLUSIONS: A ten-day course of low-power laser stimulation of acupuncture points in patients with bronchial asthma improves both the lung function and gas exchange parameters. Positive effects of laser treatment in patients with bronchial asthma are achieved in a short time and they last long, for several weeks, even months. Successive laser stimulation in asthmatics prolongs periods of remission and decreases the severity of asthmatic attacks. Better positive effects of laser stimulation are achieved in younger asthmatics, in those with shorter disease history and in female patients. There is a negative correlation between effects of laser stimulation and patients' age and disease history. However, these characteristics do not affect response rate and speed but positive laser stimulation effects are achieved in a shorter period in female asthmatics.

Ter Arkh. 2002;74(3):25-8.

### **Efficacy of low intensity laser irradiation and sodium nedocromil in the complex treatment of patients with bronchial asthma]**

[Article in Russian]

**Landyshev IuS, Avdeeva NV, Goborov ND, Krasavina NP, Tikhonova GA, Tkacheva SI.**

AIM: To study efficiency of low-intensity laser radiation (LILR) and sodium nedokromil (tailed) in combined treatment of bronchial asthma (BA). MATERIAL AND

METHODS: The choice of the treatment depended on the activity of bronchial inflammation and the presence of contraindications. Laser was used on the skin in the area of the lung and great vessels projection, endobronchially. Tailed was given in

inhalations and irrigations of the tracheobronchial tree during therapeutic fibrobronchoscopy. These methods were used in combined treatment of 220 BA patients. RESULTS: Combined use of LILR and tailed proved highly effective and safe in BA. Cytological markers of cell reactions of the bronchopulmonary system on the action of LILR were revealed. CONCLUSION: Availability, good reproducibility, cost-effect efficacy and safety make LILR one of the most beneficial nonpharmacological treatments for bronchial asthma.

### **The treatment of bronchial asthma with LLLT in attack-free period in children.**

Ailioaie C, Ailioaie L.

98 patient aged 10-18 years, diagnosed with moderate or severe asthma were divided into three groups. -Group 1: 35 patients received laser acupuncture using extrameridian acupuncture points plus scanning. Lasers used were 670 and 830 nm, 50 and 200 mW respectively, in continuous mode. Treatment was given twice daily 10 days per month, 3 months in total. No other therapy was given. -Group 2: 33 patients inhaled Salmeterol xinofoat 2 x 25, twice daily for 3 months. -Group 3: 30 patients were treated with Theophylline retard 15 mg/kg every 12 hr for 3 months. Results: A noticeable improvement in the clinical, functional and immunological characteristics were observed in 83% of the patients in group 1, 70 in group 2 and 53 in group 3. There were no side effects in the laser group.

### **[Effects of laser therapy on lipids and antioxidants in blood of patients with bronchial asthma]**

[Article in Russian]

**Rakitina DR, Urias'ev OM, Garmash VIa, Ivanova MV, Krasnovid NI, Lebedev AV.**

Laser therapy was assessed for effects on lipoperoxides and free radical catchers in blood lipids of patients with bronchial asthma (BA). When a group of 52 BA patients was compared to healthy donors by dienic conjugates, vitamin E and overall lipid-soluble antioxidants levels in the whole blood and plasma, these appeared higher in the asthmatics. Combination of laser therapy with conventional treatment returned these parameters close to normal.

Ter Arkh. 2002;74(3):40-3.

### **[Parameters of membrane permeability, microcirculation, external respiration, and trace element levels in the drug-laser treatment of pneumonia]**

[Article in Russian]

**Amirov NB.**

**AIM:** To study effects of laser therapy in combined treatment of pneumonia on external respiration function, membrane permeability, microcirculation and serum trace elements. **MATERIAL AND METHODS:** 142 pneumonia patients were randomly divided into two groups: 96 patients treated with drugs and laser radiation (the study group) and 46 patients treated with drugs only (control group). **RESULTS:** In the study group there was more pronounced reduction in cell membrane permeability, a rise in concentrations of iron and chromium in the blood serum, improvement of microcirculation. These changes closely correlated with those in immunity, external respiration function. **CONCLUSION:** Laser therapy is an effective method of pneumonia treatment and can be included in relevant combined schemes.

**THERAPY IN PATIENTS WITH CHRONIC OBSTRUCTIVE BRONCHITIS (COB)**

Nikitin A.V., Evstratov A.Yu., Esaulenko I.E.  
Medical Academy, Voronezh, Russia

A variety of mechanisms of laser irradiation in non-specific immunity stimulation have been reported lately. One of the factors contributing to the frequent exacerbation's of COB is the presence of the secondary immunological insufficiency in this category of patients. The aim of the present study is to analyze the results of different schemes of the low intensity laser therapy use and its influence on cellular immunity and the clinical course of the disease in patients with COB during the period of exacerbation. 100 patients, 78 male and 22 female, the mean age was 51, with the diagnosis of COB and respiratory insufficiency I-II, were divided into 4 equal groups at random. Patients of the first group underwent endovascular laser irradiation of the blood by the helium-neon laser installation "ALOK-I" with the irradiation power of 2mW; the second group received the contact treatment on the projection of the main bronchi, interscapular area by the infrared laser installation "Mustang-017" with the power of 8-10W. The third group received the combination of endovascular laser irradiation with the contact one, The course of laser therapy in all group lasted for 15 days and was combined with conventional therapy. The control group of patients underwent only conventional therapy including antibacterial drugs, vitamins, physiotherapy. The indices analysis of the immunity cellular link in the dynamics of laser therapy and conventional therapy in these groups has shown the evident positive dynamics of the initially decreased T-lymphocytes (CD, J, T-suppressors (CDg<sup>^</sup>), B-lymphocytes (CD,<sup>^</sup>) ( $p < 0,05$ ). The best results were observed in patients who had received the combination of endovascular laser irradiation with the contact one ( $p < 0,05$ ). In the control group the dynamic of the studied indices was positive, but not strongly marked ( $p > 0,05$ ).

Vopr Kurortol Fizioter Lech Fiz Kult. 2001 May-Jun;(3):15-8.

## **[Laser therapy of elderly patients with pneumonia]**

[Article in Russian]

**Lutai AV, Egorova LA, Shutemova EA.**

The aim of the study was to evaluate the efficiency of laser therapy included into the treatment of pneumonia in the elderly. A follow-up included the analysis of their clinical status and external respiratory function, pulmonary blood flow, and immunological parameters in 2 matched groups of pneumonia patients aged 60 to 72 years. Low-intensity laser therapy (transcutaneous sliding contact procedure) was used as part of routine treatment in one of the groups. The findings demonstrate that non-drug treatment had an undeniably positive impact. There was an earlier regress of clinical symptoms and a sound recovery of functional parameters. In the absence of side effects of this method, these data allow infrared laser therapy to be recommended for rehabilitation of elderly patients with pneumonia.

## **LOW-LEVEL LASER THERAPY IN PATIENTS WITH PNEUMONIA**

Kustova N.L., Yemelyanova L.A.  
Urals State Medical Academy, Yekaterinburg, Russia

We compared the effectiveness of complex treatment including transcutaneous low-level laser radiation of chest by He-Ne laser /66 patients/, AsGa laser/68 patients/, magnet-laser therapy/66 patients/ and decimeter-wave therapy /62 patients/. We used individual laser radiation dosing method according to V.M. Lisienko and R.I Mintz / 1987/. All three types of laser therapy have beneficial influence on inflammation process in patients with pneumonia, having positive effects on laboratory and rentge-nological symptoms. After such treatment patients recover two times faster, especially after infrared laser radiation or its combination with magnettherapy. Structural optical serum properties evaluation with the help of polarization microscopy and refractometry methods showed that there are many liquid crystals of different types in the beginning of pneumonia. There is feedback between serum refraction index and severity of pneumonia, existence of complications. After treatment serum refraction index average values returned to normal in all four groups of patients. Laser therapy improves immune status of patients. Magnet-lasertherapy and infra-red laser radiation are the most effective, including cases of lingering disease. Individual laser radiation dosage stimulates phagocytosis. According to the above-mentioned complex treatment of pneumonia can include low-level laser radiation.

## **USE OF LOW POWER LASER LIGHT IN TREATMENT OF A CHRONIC PURULENT BRONCHITIS**

G.G. Prosorova , A.F. Anoshkina, S.A. Afendulov

Physician in Chief, Medical Centre of the Novolipetsk, Lipetsk, Russia

Transplantation of autologous leukocytic suspension extracorporeally cured with a helium-neon laser "TPLA" of  $\lambda = 632,8$  nm and an exit light conductor power of 1,5 mW was made use of in treatment of 53 pts suffering with CPB. Curing was applied during a 7 minutes period. Transplantation of AL suspension was carried out during a sanitation fibroscopy (FN3). The treatment was conducted up to a normalisation in an endoscopy state and elimination of clinical and laboratory inflammatory signs. The results were compared to those of the conventionally treated 32 CPB pts (antibiotics, broncholytics, FBS with an infusion of mycosolvin and furagin). The following phenomena were revealed: 1) an improvement in the blood cells phagocytic activity under an application of HNL light cured autoleukosuspension. An increase in Ph% from 71,8 up to 88,8 ( $p < 0,05$ ), in PhN from 5,3 up to 8,9 ( $p < 0,05$ ), in PhCV from 0,76 up to 1,01 ( $p < 0,05$ ) was evidenced, besides, these post treatment values in the experimental group didn't differ from those of healthy persons ( $p > 0,05$ ); 2) a reduction in a number of FBS sessions from 5-7 conducted during the conventional treatment down to 3-4 ones carried out with LL- cured AL suspension. 3) a reduction in the quantity of anti-biotics administered: while carrying out transplantation of autoleukosuspension cured with HNLaser light we could completely reject antibiotics administration and only 1 pt had to be subjected to a second course of administering antibacterials preparations, whereas during the conventional treatment antibiotics were administered to all the pts, and 47,1% of them had to be subjected to a double course of antibiotics therapy; 4) a reduction in an average hospital stay period from 30,2 down to 23,8 days. Thus, an introduction of transplantation of HNL- cured AL-suspension into the CPB pts therapy causes an increase in the organism's non-specific resistance, minimises a medicamentous load upon a pt and cuts down a duration of a hospital stay period.

## **THE EFFECTIVENESS OF A LASER BEAM THERAPY IN A COMPLEX HEALTH RESORT TREATMENT OF PATIENTS WITH BRONCHIAL ASTHMA**

L.I. Pogosyan, S.A. Molchanov, T.V. Daraeva, V.A. Novozhilova,

T.N. Prozorova, V.I. Dmitrienko

Kislovodsk, Russia

Rehabilitation and health improvement of patients with chronic, non-specific lung diseases at the health resort of Kislovodsk with the help of a wide application of the natural physical factors alongside with the laser beam therapy is of great importance. The observation covered 79 patients with bronchial asthma (BA) of the age range from 32 to 56 with an atopic and infectious-atopic form under a mild and moderate flow. At

the initial stage the prevailing majority of the observed patients demonstrated a considerable deviation from the norm concerning the parameters of external breathing function (EBF-83,1%), more than half of the patients-that of the level of adaptation reactions (Garkavi-Kvakina-Ukolova), as well as of the immunity status (V.G.Vogralik, M.V.Vogralik), 73,4% and 62,6% accordingly, and almost half of the patients - that of the peroxide oxidation of lipids (POL -42,8%) . A group of 54 patients (the Main group, MG) received an infra-red, continuous wave laser therapy by means of the "AZOR-2K" device, alongside with the general complex spa treatment (natural factors, carbonic mineral baths, massage, electro- and curative physical therapy, etc.), which the Reference group (RG) of 25 patients received. The total aggregated dose of laser energy per session was 12 J , the course of treatment - 10-15 procedures. As a result, the overwhelming majority of the patients (98,4%) enjoyed an improvement of clinical, laboratory and functional parameters , group-wise : MG - 99,1%; RG -92,3%. A differential analysis of the results obtained in the MG itself has revealed a higher, although unreliable percent of correction of the acquired immunodeficiency and of optimisation of adaptation processes in comparison with a degree of positive dynamics concerning other parameters (EBF, POL). Taking into consideration previous results the observations demonstrated that the introduction of the laser therapy into the complex health resort treatment enhances for certain the effectiveness of the treatment of patients with BA. We should specifically mention the positive effect of the physical factors, in combination with the laser therapy, on the level of adaptation reactions and their immunocorrective influence with patients, suffering from BA complicated by the secondary immunodeficiency.

## **COMPARATIVE EFFECTIVENESS DETOXICATION TRANSFUSION OF THERAPY (TT) AND INTRAVENOUS OF A LASER IRRADIATION BLOOD (ILIB) IN COMPLEX TREATMENT OF PATIENTS BY A PULMONARY TUBERCULOSIS**

P.I.Pitcyco, E.I.Krivoshapova Kharkov Institute of Physicians Advanced Training, Kharkov. Ukraine

Two groups of the patients infiltrative by a pulmonary tuberculosis in a phase of decay, MBT+, (discovered Koch's bacillus), comparable on a floor, age, pronounced intoxication and syndrome, extent of process in lungs and regime of chemotherapy. I groups 45 patients receiving TT (albumen 5%- 100 ml alternated with haemodesum 200 ml, daily 10), II groups - 68 patients, which was carried out ILIB(wavelength 0,63  $\mu$ m, capacity of radiation on an output flexible monofiber conductor of light 2 mW, duration of a procedure 15 minutes, course 10 sessions). The efficiency of therapy was estimated on a reduction intoxication, which degree was defined on a level and structure middle molecules (MM) ( presence of pathological fractions and dis-polypeptidemy) in whey of blood. MM were studied prior to the beginning and after realisation of rates TT and ILIB by a method helium-chromatography on helix "Toyop-carl HW-40F" (Japan). A normal level and structure MM ( $361 \pm 14$  cond I. unit) was established with inspection 40 healthy donors. It is established, that at the patients from I groups after realisation of a course TT the general level MM on the average has decreased from  $858 \pm 29$  unit till

769 ± 31 unit (p<0,05), the frequency dispolypeptid-cmy (from 75 ± 7,3 % till 33 ± 6,7 % has decreased; p<0,001) and pathological fractions (from 60 ± 7,2 % to 40 ± 7,2 %; p>0,05). After a course ILIB investigated parameters also have decreased: a level MM from 920 ± 36 unit to 584 ± 23 unit (p<0,001), frequency dispolypeptidcmy from 78 ± .6,2% to 31 ± 6,8% (p<0,001) and pathological fractions from 67 ± 6,7% till 24 ± 6,4 % (p<0,001). From the given data it is visible, that the course ILIB in comparison with TT allows more and level of pathological fractions (24 ± 6,4 % against 40 ± 7,2 %).

## **SORT-SANATORIUM TREATMENT OF PATIENTS SUFFERING FROM LUNGS DISEASES WITH THE HELP OF LOW-INTENSIVE LASER ERADIATION**

I. Shuvalova, I. Klimcnko Sanatorium <Pnicpcr>, Yalta, Ukraine

With the view of improvement of effectiveness rate of resort-sanatorium treatment of patients suffering from chronic non-specific lungs diseases (CNLD) we have used low-intensive laser eradiation. 160 patients suffering from CNLD have been exam-ined, including 50 patients suffering from bronchial asthma of mild and average sever-ity, 60 patients suffering from chronic obstructive bronchitis, and 50 patients suffering from chronic non-obstructive functionally unstable bronchitis. All the patients have been divided into two identical groups according to their sex, age and nature of the disease. 40 patients from the first group received traditional course of treatment con-sisting of clima-totherapy, massage, exercise therapy. Apart from the above mentioned measures, the course of treatment of the second group (120 patients) employed laser therapy. The treatment was provided by dint of scanning the thorax with Helium-Neon laser eradiation with the power density equal to 80-100 mW/cm<sup>2</sup>. Besides, acupunc-ture areas were exposed to infrared eradiation with power rate equal to 4-5 W and fre-quency rate equal to 150-80 Hz. The course of treatment consisted of 7-12 everyday treatment measures. The patients who received the laser therapy improved the function of external respiration (FER) in 93.7 % of cases. An immunodelting effect and re-gress of phlogistic processes have also been observed. The patients from the reference group improved FER only in 37.5% of cases; there were no essential changes in the state of phligistic processes and of immunity either. The analysis of the actual results of treatment demonstrated the fact that the remedial complex making use of the laser therapy produces a visible clinical effect (considerable improvement - in 43.3% and improvement -in 56.7% of cases). 89% of the patients from the reference group expe-rienced improvement, and 11% of them were discharged without any changes. Thus, laser therapy is a strong efficiency-advancing factor of the integrated treatment of pa-tients suffering from (CNLD).

## **THE EFFECTIVENESS OF BIOCONTROLLED IMPULSE LASER RADIATION IN CHILDREN BRONCHOPULMONARY DISEASES**

Chernyishcheva L.A., Khan M.A., Scrcda E.V, Semenova N.Y. SRI of pediatrics of RAMS, Moscow

Laser therapy is being widely introduced in cases of respiratory organs diseases, as a result of medical supersaturation of the sick child's organism, the growing resistance to medicaments, the development of toxic and allergic reactions. In the complex therapy of 80 sick children with chronic bronchopulmonary disease the biocontrolled impulse laser radiation of ALT "Mustang-BIO" with auto-synchronisation of radiation parameters with the patient's rhythm of pulse and respiration was used. The action was carried out through the contact with reflexo-segmental zone (D, D<sup>^</sup>) and the zone of the pathologic focus projection in the period of exacerbation and incomplete remission of the diseases according to the standard procedure. The effectiveness was estimated with regard to clinic, functional. X-ray-bronchial and cytochemical research before, after a single procedure and after a course of treatment. The carried research showed individual sensitivity of children to the established individual dose of the action, 18.75% of sick children after the first single procedure demonstrated a certain, compared to the control group, improvement of external respiration. During the course of treatment most patients (85%0 showed the lessening or liquidation of physical changes in lungs, the decreasing activity of the inflammatory process, the improvement of cytochemical characteristics. Cat-amncsis study, carried out in 6 and 12 months showed the stability of the therapeutic effect. The obtained data broaden the possibilities of pathogenic therapy of chronic bronchopulmonary children diseases.

## **THE EFFECIENCY OF THE LASER THERAPY IN THE TREATMENT OF BRONCHIAL ASTHMA SUFFERED BY CHILDREN**

I.M. STRELTSOV Volgograd Regional Children's Clinic , Volgograd, Russia

In the recent years there is a considerable increase of bronchial asthma diseases, the tendency of the aggravation of this disease being more and more noticeable herewith . There is also a tendency for more and more resistance to the therapy conducted . That is why the bronchial asthma treatment still remains one of the most crucial and viable issues in the contemporary medicine . According to the literature data and facts , laser therapy has been successfully applied for more than 10 years . We have applied this method to 49 children suffering from bronchial asthma. Laser therapy was effected by the infrared semiconductor laser AL-09 . All the patients were split into 3 groups . The first group comprised 19 children , who have had intradermal laser therapy. The 16 patients of the second group have received I/V (intravenous) laser therapy . The rest 14 children of the third group have received laser therapy combined with plasmapheresis . The sample group consisted of 17 children who have had Sodium Gromoglicatc treatment combined with symptomatic means . The efficiency of the treatment effected was assessed in accordance with the 3 point system, 2 and 3 points being considered satisfactory. After the treatment has been completed the satisfactory results breakdown looks as follows : the first group - 56.2% ; the second group - 75% ; the third group -85.7% of the cases . In control group the positive results are registered only at 29.4% of the children. All the

abosc said shows that laser therapy proved to be an effective method of the bronchial asthma treatment for children, I/V laser application being more effective than its intravenous application. The major therapeutic effect of the combination of laser therapy with plasmapheresis is , probably , connected with the application of plasmapheresis . Laser application during the bronchial asthma treatment for children allows one to considerably reduce the medication pressure on the human body.

Ultrastruct Pathol. 2000 May-Jun;24(3):183-9.

### **Ultrastructure of the blood and lymphatic capillaries of the respiratory tissue during inflammation and endobronchial laser therapy.**

**Polosukhin VV.**

Laboratory of Ultrastructural Research, Russian Academy of Medical Sciences, Novosibirsk, Russia. vpolosuk@unmc.edu

For wide application of low-energy laser irradiation in the pulmonary clinic, study of the structural basis of the therapeutic effect is necessary. The aim of this research is to describe the structural changes of the blood and lymphatic capillaries in the respiratory tissues during inflammation and following laser biostimulation. Comparative ultrastructural study was carried out on 127 open respiratory biopsy specimens from 45 patients with infectious-destructive lung diseases. These patients were divided into two groups, depending on tactic of pre-operative therapy: patients treated by only traditional anti-inflammatory measures and patients receiving additional laser therapy. Heightened permeability of the blood capillary endotheliocytes was noted as the initial stage in the development of the inflammatory reaction. Intensification of the process of permeability is accompanied by interstitial edema, deformation of the interalveolar septa, and structural disorganization of alveolar epithelium cells. Local lesions of microcirculation result in tissue hypoxia and induce processes of fibrosis. Laser biostimulation promotes reversion of the inflammatory process and stabilizes fibroplastic processes. Basic principles of pathogenetic therapy were stated. It was shown that low-energy laser irradiation satisfies these requirements as an additional method in the therapy of destructive lung diseases.

Indian J Chest Dis Allied Sci. 2003 Jan-Mar;45(1):19-23.

### **Role of gallium arsenide laser irradiation at 890 nm as an adjunctive to anti-tuberculosis drugs in the treatment of pulmonary tuberculosis.**

**Puri MM, Arora VK.**

Department of Tuberculosis and Chest Diseases, LRS Institute of Tuberculosis and Allied Diseases, Sri Aurobindo Marg, New Delhi, India.

**BACKGROUND:** Tuberculosis is a global emergency with about nine million people

developing disease every year. The long duration of treatment has emerged as a major obstacle in the control of tuberculosis. There is a need for development of new drugs and or shortened therapy. **METHODS:** The present study was carried out to explore whether any benefit could be achieved by the addition of low level energy laser therapy (LLLT) to the conventional anti-tubercular chemotherapy. One-hundred-thirty new sputum smear positive patients of pulmonary tuberculosis were enrolled to evaluate the bio-stimulatory effects of Gallium Arsenide laser irradiation at 890 nm, as an adjuvant therapy. These patients were randomly divided into two groups to receive either LLLT or sham irradiation (control) concomitantly with anti-tuberculosis chemotherapy. **RESULTS:** The patients treated with semiconductor laser as an adjuvant therapy along with anti-tuberculosis drugs had a faster clearance of tubercle bacilli from the sputum as compared to the control group (P value at :45 days=0.1392, 60 days=0.0117, 75 days=0.00805, 90 days=0.00739). **CONCLUSIONS:** These findings provide preliminary evidence that low level laser therapy with Gallium Arsenide laser may be a promising adjunctive therapy for patients with tuberculosis. Faster conversion of sputum should prevent the development of resistant mutants.

### **Low level laser therapy for treating tuberculosis.**

The Cochrane Database of Systemic Reviews. 2002.

Vlassov V V, Pechatnikov L M, MacLehose H G.

The authors have made a thorough literature search for studies using laser therapy as an adjunct therapeutic modality in the treatment of tuberculosis. These studies come from the former Soviet states and India. The studies in Russian language have generally only been available as Medline abstract and they have been vague on the details. Now, for the first time, Russian researchers have evaluated the original texts. Laser therapy has been used in many ways. Acupuncture points, irradiation over the organ, blood irradiation, puncture into the lungs, irradiation into the trachea and into the urinary bladder. Laser types used have also differed a lot; HeNe, nitrogen, GaAs, Nd:YVO4 and at powers ranging from 2 to 200 mW. The weak spot in previous Cochrane reviews on laser therapy has been the lack of dosage analyses. No such analysis has been made in the current study, but with the different therapeutic approaches used, such an analysis is not possible in this case. The reviewers have not found any randomised or quasi-randomised studies, but an evaluation of the quality of the studies has been performed. There is a lack of relevant information on procedures in many studies and some contradictory statements. All in all, the reviewers come to the conclusion that laser therapy is currently being used to treat tuberculosis without evidence of its benefits and harms.

Probl Tuberk. 2002;(8):16-8.

**[Efficiency of supra-venous blood laser radiation used in the treatment of disseminated pulmonary tuberculosis in adolescents]**

[Article in Russian]

**Rusakova LI, Dobkin VG, Ovsiankina ES.**

In 19 of 40 adolescent patients with disseminated pulmonary tuberculosis, supravenuous blood laser radiation was used in the complex treatment 2-3 weeks after the initiation of chemotherapy. The use of this type of laser therapy enhanced the efficiency of the treatment, accelerated positive changes of tuberculosis by 2.5-3.5 months, as evidenced by clinical and laboratory parameters, led to a smooth course of tuberculosis to develop less pronounced residual changes in the lung.

Cochrane Database Syst Rev. 2002;(3):CD003490.

### **Low level laser therapy for treating tuberculosis.**

**Vlassov VV, Pechatnikov LM, MacLehose HG.**

Russian Branch, The Cochrane Collaboration, PO Box 54, Moscow, Russia, 127238.  
vlassov@cochrane.ru

**BACKGROUND:** The main treatment for tuberculosis is antituberculous drugs. Low energy laser therapy is used as an adjunct to antituberculous drugs, predominantly in the former Soviet Union and India. **OBJECTIVES:** To assess the benefits and harms of low level laser therapy for treating tuberculosis in randomized and quasi-randomized controlled trials. To seek information about potential benefits or harms from observational studies. **SEARCH STRATEGY:** We searched the Cochrane Infectious Diseases Group specialized trials register (up to June 2001), the Cochrane Controlled Trials Register (Issue 1, 2001), MEDLINE (1966 to December 2001), EMBASE (1988 to December 2001), CINAHL (up to November 2001), PEDro (up to November 2001), the Science Citation Index (up to December 2001), National Centre for Science Information at the Indian Institute of Science (15 April 2002), electronic catalogue of the Central Medical Library (Moscow; 1988 to January 2002), the internet using 'Google' (21 January 2002), and reference lists of articles. We contacted relevant organizations and researchers. **SELECTION CRITERIA:** (1) Randomized and quasi-randomized controlled trials comparing low level laser therapy with no low level laser therapy in people with tuberculosis. We also conducted a subsidiary analysis of the potential benefits and harms from observational studies. **DATA COLLECTION AND ANALYSIS:** Two reviewers independently assessed trial quality and extracted data. We contacted study authors for additional information. Adverse event information was collected from the studies. **MAIN RESULTS:** No randomized or quasi-randomized controlled trials met the inclusion criteria for the review. The potential benefits and harms from 29 observational studies involving over 3500 people are described. **REVIEWER'S CONCLUSIONS:** We have not identified any well designed trials using low level laser therapy (LLLT) to treat tuberculosis. Therefore, the use of LLLT to treat tuberculosis is not supported by reliable evidence.

Probl Tuberk. 2002;(8):16-8.

## **[Efficiency of supra-venous blood laser radiation used in the treatment of disseminated pulmonary tuberculosis in adolescents]**

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## **COMPARATIVE EFFECTIVENESS DETOXICATION TRANSFUSION OF THERAPY (TT) AND INTRAVENOUS OF A LASER IRRADIATION BLOOD (ILIB) IN COMPLEX TREATMENT OF PATIENTS BY A PULMONARY TUBERCULOSIS**

P.I.Pitcyco, E.I.Krivoshapova

Kharkov Institute of Physicians Advanced Training, Kharkov. Ukraine

Two groups of the patients infiltrative by a pulmonary tuberculosis in a phase of de-cay, MBT+, (discovered Koch's bacillus), comparable on a floor, age, pronounced intoxication and syndrome, extent of process in lungs and regime of chemotherapy. I groups 45 patients receiving TT (albumen 5%- 100 ml alternated with hacmodesum 200 ml, daily ?10), II groups - 68 patients, which was carried out ILIB(wavelength 0,63 urn, capacity of radiation on an output flexible monofiber conductor of light 2 mW, duration of a procedure 15 minutes, course 10 sessions). The efficiency of therapy was estimated on a reduction intoxication, which degree was defined on a level and structure middle molecules (MM) ( presence of pathological fractions and dis-polypeptidemy) in whey of blood. MM were studied prior to the beginning and after realisation of rates TT and ILIB by a method helium-chromatography on hcle "Toyop-carl HW-40F" (Japan). A normal level and structure MM ( $361 \pm 14$  cond I. unit) was established with inspection 40 healthy donors. Is established, that at the patients from I groups after realisation of a course TT the general level MM on the average has de-creased from  $858 \pm 29$  unit till  $769 \pm 31$  unit ( $p < 0,05$ ), the frequency dispolypeptid-cmy (from  $75 \pm 7,3$  % till  $33 \pm 6,7$  % has decreased;  $p < 0,001$ ) and pathological fractions (from  $60 \pm 7,2$  % to  $40 \pm 7,2$  %;  $p > 0,05$ ). After a course ILIB investigated parameters also have decreased: a level MM from  $920 \pm 36$  unit to  $584 \pm 23$  unit ( $p < 0,001$ ), frequency dispolypeptidemy from  $78 \pm 6,2$ % to  $31 \pm 6,8$ % ( $p < 0,001$ ) and pathological fractions from  $67 \pm 6,7$ % till  $24 \pm 6,4$  % ( $p < 0,001$ ). From the given data it is visible, that the course ILIB in comparison with TT allows more and level of pathological fractions ( $24 \pm 6,4$  % against  $40 \pm 7,2$  %).

Minerva Med. 1983 Jun 30;74(27):1683-8.

**[Antiasthma therapy with laser radiation of the stellate ganglia]**

[Article in Italian]

**Bence L, Dussert G.**

The authors present a 42-case series of bronchial asthma treated with laser therapy. The technique consists in the use of a diode laser with transcutaneous irradiation projected anteriorly into stellar ganglion. The clinical cases are presented together with the therapeutical results, pointing out how children are more receptive to this therapy and outlining the importance of timing and hour of treatment.