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## **THE EVOLUTION OF LASERTHERAPY IN FETO-MATERNAL MEDICINE**

For the purpose of optimization of a treatment process laser therapy has occupied a prominent place in an obstetrical practice. Its potentialities in a gynecological practice are limitless. Considering pathophysiological mechanisms of the effect of laser radiation on the organism, in gynecology all methods of laser treatment available in clinical practice are being used.

The most widespread and broadly applied in an obstetrical practice type of laser radiation is a helium-neon laser (of wave-length 632,8 nm). Basic methods of laser therapy in feto-maternal medicine are: laserreflexotherapy (laser-puncture), intravenous (invasive) laser-therapy, transdermal laser-therapy (non-invasive), endovaginal laser-therapy. The effect of laser on a living organism is based on a biostimulative effect consisting in activation of the organism's most important ferments: activated are bioenergetic and biosynthetic processes and in the end a biological therapeutic activity is revealed. Widely recognized are the following parameters of a biostimulant effect of low-intensity lasers: a wave-length range - 620-670 nm, power density - 2,5-200 mW/cm<sup>2</sup>, irradiation dose - 3-9 J/cm<sup>2</sup>.

The effect of a helium-neon laser on the organism is reflected in the following clinical changes: stimulation of metabolism, normalization of microcirculation, desensibilisation activity, increase of the resistance of tissues to pathogenic agents, improvement of immunogenesis, dehydration and thrombolytic activity, analgesic effect, anti-inflammatory activity, the decrease of pathogenicity of a microbotic factor, the increase of sensitivity of pathogenic and relatively pathogenic microorganisms to the effect of an antibacterial therapy.

## **IRRADIATION OF BLOOD BY LASER. INTRAVENOUS AND TRANSDERMAL LASERTHERAPY**

The following changes occur following irradiation of blood by laser: changes in interrelations of molecules (lipid-water, protein-water, lipid-protein, conformational transformation in proteins); changes of physical and chemical properties of bioliquids (of rheology, diffusion, phase stability, various mechanical, transportation and

membranes properties of organelles and cells; changes of activity of biochemical reactions.

As a result of a low-intensity laser action during a given pathology detoxication effect, thrombolytic action, stimulation of tissue regeneration, increase of cells' resistance to pathogenic agents, stimulation of general and local factors of immune protection, the decrease of pathogenicity of microbes and growth of their sensitivity to antibiotics, normalization of liquid metabolism and some other therapeutic effects were observed.

Indications for laser irradiation of blood: septic state (virus, chlam<sup>^</sup>dic, mycoplasmic, toxoplasmic), mycosis, staphylococcus, streptococcus and other infections, antiphospholipide syndrome; immunodeficiency.

During irradiation of blood by the intravenous invasion method preference is given to helium-neon laser with power density of 1-5 mW/cm<sup>2</sup>; the procedure is conducted every other day or daily. Duration of each procedure - 15-20 min., 7-12 procedures in all.

During irradiation of blood by transdermal (non-invasive) method over blood vessels preference is given to helium-neon laser with 20-50 mW/cm<sup>2</sup> power density. Duration of each procedure - 10-25 min. Procedures are carried out daily, during 10-15 days. It is preferable to use an elbow vein.

## **STANDARDS OF LASERTHERAPY IN THE OBSTETRICS PRACTICE**

Treatment of pregnant with laser beam is in no case of a monotherapeutic character, but is combined with minimum doses of medical preparations. In such cases our main objective is to avoid adverse side effects of medications on a mother's organism, the decrease of pharmacological loading on a fetus' organism.

### ***Pregnants' anemia***

**Indications for lasertherapy:** 1) Pregnants' anemia of I-II degree; anemia of III degree in combination with an infusion-transfusion therapy. Hypoferric anemia of I-II degree combined with other complications (Gestosis, resus-iso-sensibilisation, threatened abortion, threatened immature delivery and others) and with extragenital pathologies (chronic diseases of kidneys, liver, gastric and intestinal diseases<sup>^</sup>

For lasertherapy helium-neon laser beam is used with the wave-length of 632,8 nm. The seance is conducted on a daily basis. The length of treatment is from 3 to 12 days depending on the severeness of case. Exposition on each point - 10-30 sec.

### ***Pregnants' arterial hypotonia***

**Indications for lasertherapy:** 1) Symptomatic hypotonia before pregnancy; 2) Arterial hypotonia during pregnancy (originated). For lasertherapy helium-neon laser beam is used with a wave-length of 632,8 nm. Exposition on each point - 30-40 sec, number of procedures - 7-10. Three treatment courses are conducted with 7-day intervals.

### *EPH-Gestosis*

**Indications for laser-therapy:** EPH-Gestosis of I-II degree. For lasertherapy helium-neon laser beam is used with a wave-length of 632,8 nm. Exposition on each point - 10-15 sec, number of procedures-7-10.

Contra-indications for lasertherapy: 1) Pregnants' negative attitude towards lasertherapy. EPH-Gestosis of III degree combined with severe forms of extragenital diseases; 3) Severe form of EPH-Gestosis; 4) Somatic diseases during which pregnancy is a contra-indication.

### *Threatened abortion*

**Indications for laser-therapy:** threatened abortion caused by ovarian hypofunction. Object - stimulating endogenic hormone production by trophoblast. Helium-neon laser beam is used with a wave-length of 632,8 nm. Exposition on each point - 10-15 sec, number of procedures - 8-11.

### *Vomiting of pregnant*

**Indications for laser-therapy:** 1) Pregnants' vomiting of light degree; 2) Pregnants' vomiting of medium degree. For lasertherapy helium-neon laser beam is used with a wave-length of 632,8 nm. Exposition on each point - 10-15 sec, number of procedures-7-13.

### *Hypotrophia of fetus (a syndrome of disturbances in the growth of fetus)*

**Indications for laser-therapy:** Hypotrophia of fetus of I and II degrees. For lasertherapy helium-neon laser beam is used of the wave-length 632,8 nm. Exposition on each point - 10-15 sec, irradiation of the abdomen front wall skin (according to echolocation of placenta) for 2 min during 7-10 days.

### *Pregnants' preparation for labor and labor induction*

**Indications for laser-therapy:** 1) EPH-Gestosis of I and II degrees after inefficient treatment during 10-14 days; 2) Rezus-conflict; 3) Extragenital pathology and pregnancy; 4) Non-typical preliminary period; during hyperactivity of uterus (based on hystero-graphic data) at the pregnancy of 3B/40 weeks. For lasertherapy helium-neon laser beam is used with the wave-length of 632,8 nm. Exposition on each point -10-15 sec, number of procedures - 3-5.

### *Intrauterine infections: chlamydios, mycoplasmos, herpes, citomegalia, toxoplasmosis*

### *Urogenital chlamydios, uraeamycoplasmic infection*

**Indications for laser-therapy:** chronic urogenital infection in an acute phase in the case when pregnancy progresses in the presence of a chronic chlamyrdic and (or) uraeamycoplasmic infection.

For intravenous lasertherapy helium-neon laser beam is used with the wave-length of 632,8 nm, 2-3 mW once a day for 15-20 min intravenously during 7-10 days.

At the disclosure of chlamydic and (or) uraeamycoplasmic infection a first course of intravenous lasertherapy is carried out at the completion of 12 weeks of pregnancy. Repeated courses are indicated in cases when clinical and ultrasound signs indicate that fetus is infected as well as prior to delivery in the case of apparent progress of the disease.

### *Herpes-virus infection*

**Indications for laser-therapy:** in the cases of heavy anamnesis and complicated pregnancy. By laboratory investigation a simple herpes-virus is revealed during pregnancy. For lasertherapy helium-neon laser beam is used with the wave-length of 632,8 nm and power 1,5-3 mW.

**Regime of flathertherapy:** Alternation of a general lasertherapy and the local one; irradiation of blood from skin (by transdermal method) with power equaling 1,5-2 mW, exposition - 7-10 min, every other day, 3-5 procedures; endovaginal lasertherapy with power 1,5-3 mW, exposition - 3 min, every other day, 3-5 procedures; irradiation of damaged sections of skin during 3-5 min, every other day, 3-5 procedures. Lasertherapy is recommended after 12 weeks of pregnancy.

### *A citomegalovirus infection*

**Indications for laser-therapy:** in women with a heavy anamnesis, when by clinical and laboratory investigations reactivation of a citomegalovirus infection is proved. For lasertherapy helium-neon laser beam is used with the wave-length of 632,8 nm and power - 1,5-3 mW.

**Regime of flathertherapy:** Irradiation of blood by intravenous method with power 2-3 mW during 15-20 min; 5-7 procedures every other day; irradiation of blood by transdermal method with power equaling 1,5-3 mW, exposition - 10-15 min, 5-7 procedures every other day. Lasertherapy is recommended after a 12 weeks' pregnancy.

### *Toxoplasmodic infection*

**Indications for laser-therapy:** primary infection of a given pregnancy, when laboratory investigations reveal high and growing titres of specific anti-bodies and for the prevention of infecting fetus it is necessary to treat the pregnant. Another indication for lasertherapy is a pregnant's immunodeficit condition, proved by laboratory tests, during chronic toxoplasmosis as a risk-factor hampering a normal course of pregnancy. For intravenous lasertherapy helium-neon laser beam is used with a wave-length of 632,8 nm and power 2-3 mW once a day for 15-20 min, in a vein, during 7-10 days. Lasertherapy is recommended after a 14-weeks' pregnancy.

### *Colpitis*

Provision of pathogenetic effect is versatile: anti-inflammatory, anti-swelling, regenerative effects, improvement of local blood circulation.

Method of affecting: intravaginal irradiation. Irradiation is carried out by means of a dispersing (pointwise) light guide for 5-7 min, by helium-neon laser with power density within 2-5 mW/cm<sup>2</sup>, the wave-length of 632,8 nm during 7-10 days.

### *Erosion of cervix uteri*

Provision of pathogenetic effect is many-sided: anti-inflammatory, anti-swelling, regenerative effects, improvement of local blood circulation.

Method of affecting: irradiation of cervix uteri by means of gynaecological mirrors, set into the vagina during 10 min; by a helium-neon laser, power density within 2-10 mW/cm<sup>2</sup>, wave-length 632,8 nm during 7-10 days.