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Stage results of the investigation of the possibility of conservative treatment of the galschamary disease complicated by chronic cholecystitis

Abstract

Traditionally used surgical methods of treatment of cholelithiasis complicated by chronic cholecystitis inevitably lead to the removal of the gallbladder and to subsequent violations of digestive functions and metabolic disorders in the body as a whole. In connection with this, the search for organ-saving methods of treating this pathology is urgent. A hypothesis is advanced about the possibility of "reverse development" of pathological processes in the hepatobiliary system. As a means of stimulating such "reverse development" of the above pathological process, the use of infrared low-energy laser radiation is suggested. The results of the conducted experiments confirm the effectiveness of this approach in the conservative treatment of cholelithiasis complicated by chronic cholecystitis.

Keywords: cholelithiasis, chronic cholecystitis, transcutaneous laser therapy, disease, laser radiation, physico-chemical parameters

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Introduction

Gallstone disease complicated by chronic cholecystitis is a common disease that is traditionally offered to be treated with surgical methods. Regardless of what methods of treatment of this disease are used in surgical practice, the result is always removal of the gallbladder, which inevitably leads to a subsequent disruption of digestive functions and metabolic disorders in the body as a whole.

Nevertheless, information about the possibility of conservative treatment of this disease (in particular, methods of traditional eastern medicine) allowed putting forward a hypothesis about the possibility of "reverse development" of this pathological process.[1] The search for modern means and methods of treatment of cholelithiasis complicated by chronic cholecystitis appeared to be topical. In this respect, various methods of physiotherapeutic treatment and, in particular, laser therapy methods are of particular interest. There is information about the positive effect of low-energy laser radiation on physico-chemical parameters of bile (electrical conductivity, refractive index, dielectric conductivity, viscosity, pH, surface tension, nucleation time, etc.) in patients with cholelithiasis, and reports on the effective use of low-energy laser action in treatment of chronic cholecystitis.[1–3] Transcutaneous methods of laser action are of particular interest. When using transcutaneous methods of laser exposure, infrared lasers are most effective, since infrared laser light penetrates the body tissues to a depth of 10-12 cm (according to various studies).

Results of the research

In one of the issues of the Russian magazine "The attending physician" in 1999, a report was published on the results of a preliminary experiment on the treatment of an infrared therapeutic laser by T. F-ko, a 37-year-old woman, preparing for planned surgical treatment of cholelithiasis complicated by chronic cholecystitis.[1]

Before the start of the course of laser therapy, the patient complained of impaired well-being, a feeling of heaviness and constant pulling pains in the right hypochondrium, dyspeptic disorders. The patient for a long time used painkillers, spasmolytic and enzyme preparations. The performed ultrasound examination revealed deformation and echo signs of inflammation of the gallbladder wall, presence of calculus in the gallbladder, expansion of the hepatic bile ducts. The immobility of the concernment when the patient's body was changed was evidence of its adhesion to the wall of the gallbladder. The maximum size of the calculus in the initial ultrasound examination (before the laser therapy course) was 18.3mm (Figure 1). The test with food load (2 raw eggs, eaten on an empty stomach) revealed a significant decrease in the contractility of the gallbladder walls. In the experiment we used the infrared laser therapeutic apparatus "Binom" (Russia). As laser exposure methods, the following methods were used: the method of polygonal sequential transcutaneous laser action on the vascular plexus[1–3] and the method of polygonal transcutaneous laser action on the anatomical projections of the liver (right lobe) and the gallbladder (Figure 2). Particular mention should be made of the absolute painlessness and ease of laser procedures.

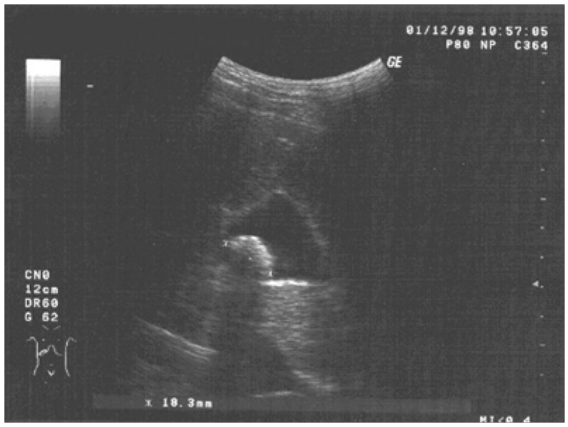

Figure 1 Initial (before the start of laser therapy) data of ultrasound examination of the gallbladder patient.

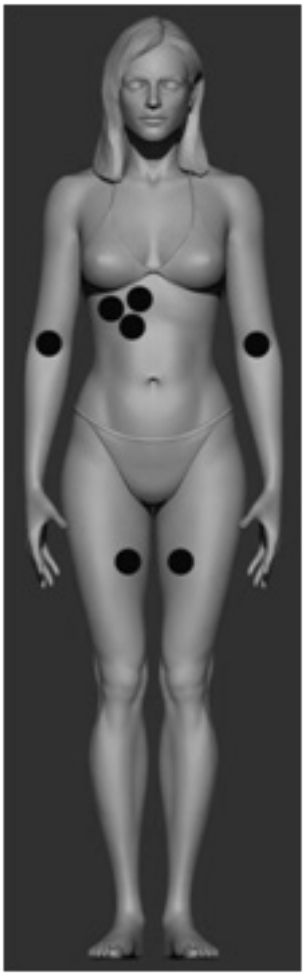

Figure 2 Zones of laser exposure in the treatment of cholelithiasis complicated by chronic cholecystitis.

The conditions of the study did not include the discontinuation of the use of pharmacological drugs previously prescribed by the gastroenterologist for symptomatic treatment. Nevertheless, the patient already after the second session of laser therapy herself refused to accept all previously took her medications-in connection with the complete disappearance of pain syndrome at this stage of treatment. Minor transient pain sensations were noted only at the end of the third week of laser therapy. During the first week of treatment the bowel function was normalized, the general condition of the patient improved.

Data from the final ultrasound (at the end of the 6-week course of treatment) revealed an actual absence of echoes of inflammation of the gallbladder wall, mobility of the calculus and a reduction in its maximum size to 11.2mm (Figure 3). Ultrasound examination after a nutritional load indicated some hyperkineticity of the gallbladder wall (a reduction in the volume of the gall bladder 77% of the original). The course of treatment of the patient T. F-ko was interrupted in connection with her departure for a long period abroad. During the following years, experimental work was continued to investigate the possibility of conservative treatment of cholelithiasis complicated by chronic cholecystitis, involving volunteer patients. During this period, 7 people (3 men and 4 women) aged 35 to 54years old participated in the experiments, with different physique, severity and length of illness.

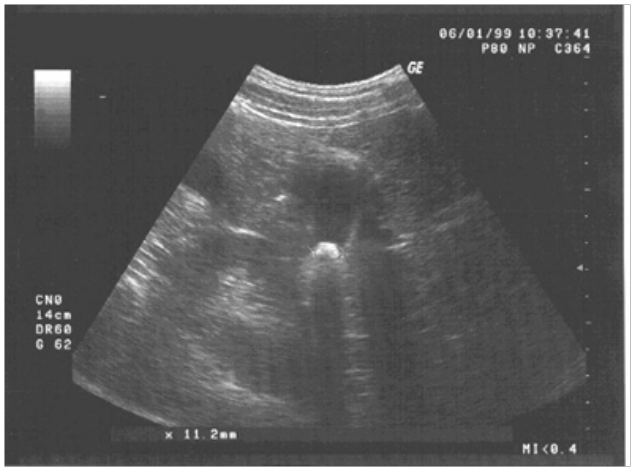

Figure 3 Final ultrasound examination of the gallbladder patient.

Each of the patients was asked to undergo an 8-week course of laser therapy. As methods of laser exposure, the following methods were used: the method of polygonal sequential transcutaneous laser action on the vascular plexus and the method of polygonal transcutaneous laser action on the anatomical projections of the liver (right lobe) and the gallbladder (Figure 2). The first 2-3 sessions were conducted by a laser therapist. The subsequent laser therapy sessions were carried out by the patients independently with the help of portable infrared laser therapeutic devices "Binom", "Success", "MILTA-Sport" (all of Russia) with matrix gallium-arsenide radiators provided with them during the experiments-with a large area (up to 20cm2) of the radiating surface. The laser therapy sessions were held every day 30minutes after the daytime meal. The total and zonal doses of laser exposure varied throughout the course of treatment in connection with the predictive modelling of the therapeutic outcome based on the dynamics of the clinical picture. Patients were advised to follow a sparing diet and regulate their diet. The participants of the experiment were warned about the danger of wedging of mobile calculi decreasing during laser therapy in the ductus choledochus and the need in this case for immediate treatment in a surgical clinic.

Patients reported to the doctor about their health on the phone every day and came to the medical examination once a week. During the initial and subsequent examinations of the patients, the doctor recorded complaints of patients and the severity of the symptoms of their diseases, which were then evaluated in a 10-point scale specially designed to evaluate the experimental results (for a maximum of clinical manifestations, a clinical picture of acute cholecystitis requiring immediate surgical intervention was adopted). Before and 4 and 8 weeks of treatment, each patient underwent an ultrasound examination of the gallbladder, including a sample with a nutritional load. Estimated: the number of concernments of the gallbladder, the size of the largest of them, the severity of echoes of inflammation of the gallbladder wall, the degree of contractility of the gallbladder after food load.

The results of the initial examination and ultrasound examination of patients who took part in the experiments are presented in Table 1. The dynamics of the severity of the clinical picture (on a 10-point scale) in patients who participated in the experiments. It should be noted that the severity of the clinical picture of the disease in question is largely related to its severity, which is also estimated, according to ultrasound data. Dynamics of the severity of the clinical picture (on a 10-point scale) in patients with cholelithiasis complicated by

chronic cholecystitis - in the course of their 8-week course of laser therapy. The dynamics of the severity of the clinical picture of the disease under consideration - against the backdrop of the 8-week course of laser therapy-was of an individual nature, which is quite understandable by the heterogeneity of the group of patients who took part in the experiments. Only three participants in the experiments (patient #1 and patient #1 and #4) after the 8-week course of laser therapy completely disappeared subjective clinical manifestations of the disease. In these patients, a preliminary ultrasound study revealed only 1 concernment, and the echo signs of the inflammatory process were of medium-severity. The disappearance of the pain syndrome after the 1st week of laser therapy in Patient No. 3 and after the 5th week of laser therapy in Patient No. 3 is associated with the anti-inflammatory effect of laser light, and the cause of the subsequent onset of pain in these patients is likely the mobility of the concernments present in their gall bladder - against the background of the normalization of the contractile function of the gallbladder.

Table 1 Data of primary examination and ultrasound examination of patients suffering from cholelithiasis complicated by chronic cholecystitis

	Floor	Rev. (years)	Height Weight	Expression of the wedge. Paintings (on a 10-point scale)	Size (mm)/number of concrements	Echoes of inflammation (on a 10-point scale)	Contractility of the gallbladder
Pt №1	м	47	183/85	5	10,2/1	4	56,8%
Pt №2	м	54	179/127	8	24,8/4	8	44,2%
Pt №3	м	49	187/98	6	14,1/2	5	51,7%
P-ka №1	same	42	172/68	6	19,4/1	4	55,1%
P-ka №2	same	35	167/72	7	18,3/7	8	39,6%
P-ka №3	same	46	165/87	7	17,8/3	7	41,9%
P-ka №4	same	38	169/65	3	15,7/1	3	58,3%

Table 2 shows the dynamics of individual data of ultrasound examination of the bile ducts of patients (baseline ultrasound, an ultrasound study conducted 4weeks after the start of the experiment, an ultrasound scan conducted 8 weeks after the start of the experiment), suffering from cholelithiasis complicated by chronic cholecystitis-in the course of their 8-week course of laser therapy. All patients showed a significant decrease in the size of the largest calculi and a decrease in echoes of the inflammatory process of the gallbladder walls - as a result of their 8-week course of laser therapy. There was a decrease in the number of concernments in Patients 2 and 3 and in Patients 2 and 3. The disappearance of concernments was fixed - after the 8-week course of laser therapy-in patient No. 1 and patient No. 4.

Table 2 Dynamics of individual data of ultrasound examination of bile ducts of patients suffering from cholelithiasis complicated by chronic cholecystitis-in the course of their 8-week course of laser therapy

No. Ultrasound	1 - Initial ultrasound		2 - ultrasound in 4 weeks		3 - Ultrasound in 8 weeks	
	Size (mm)/number of concernments	Echo-prism. Will inflame. the process (on a 10-point scale)	Size (mm)/number of concernments	Echo-prism. Will inflame. the process (on a 10-point scale)	Size (mm)/number of concernments	Echo-prism. Will inflame. the process (on a 10-point scale)
Pt №1	10,2/1	4	4,3/1	0	0	0
Pt №2	24,8/4	8	19,1/3	5	8,9/2	3
Pt №3	14,1/2	5	7,5/1	2	3,2/1	0
P-ka №1	19,4/1	4	10,6/1	0	4,7/1	0
P-ka №2	18,3/7	7	12,8/5	4	7,3/3	3
P-ka №3	17,8/3	7	9,7/3	3	4,3/2	2
P-ka №4	15,7/1	3	6,4/1	0	0	0

The dynamics of individual indicators of gallbladder contractility (%) in response to the nutritional load in patients with cholelithiasis complicated by chronic cholecystitis-in the course of their 8-week course of laser therapy. Dynamics of gallbladder contractility (%) in response to the nutritional load in patients with cholelithiasis complicated by chronic cholecystitis-in the course of their 8-week course of laser therapy. The norm is the contractility of the gallbladder in response to the nutritional load by 60-75%. The results of the initial ultrasound study of the bile ducts of patients who participated in the experiment indicated a violation of gallbladder contractility in all cases, to varying degrees. Normalization of the contractile function of the gallbladder based on the results of an ultrasound study, conducted 4 weeks after the start of the course of laser therapy, was recorded in Patient No. 1 and Patients No. 1 and No. 4. After 8 weeks of laser therapy, the normalization of the contractile function of the gallbladder was recorded in Patients 1 and 3 and in Patients 1 and 4. In other cases, a significant improvement in the contractile function of the gallbladder after 8 weeks of laser therapy was recorded.

Conclusion

Thus, the results of our experiments prove the effectiveness of the proposed method of transcutaneous laser treatment in the

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treatment of cholelithiasis complicated by chronic cholecystitis. However, the effectiveness of this method can be relatively low, in particular - in the presence of the patient's significant fat deposits in the upper abdomen (patient number 2). In such a case, when using transcutaneous methods of laser exposure, it may not be possible to achieve the required effective dose of laser radiation in organs and tissues "interested" in these pathological processes. It is extremely important that the possibility of restoring the contractile function of the gallbladder, as reflected in the course of the transcutaneous laser therapy, is fixed in our studies. It is also important that most patients (except Patient No. 2 and Patient No. 2) independently refused to take antispasmodic and analgesic medications already in the first week of laser therapy.

The results of our experiments indicate that the duration of the course of laser therapy of cholelithiasis complicated by chronic cholecystitis should be determined by the age and physique of the patient, the length of time, the clinical picture and dynamics of the disease, the number and size of concernments and cannot be limited by the generally accepted time frame for the course of physiotherapy procedures. It should not be assumed that low-energy laser radiation "destroys" the gallbladder concretions, affecting them directly. Obviously, the "destruction" of concernments is a consequence of the normalization of metabolic processes in the hepatobilliary system of the body-as a result of the action of low-energy laser light. However, we did not have the opportunity to conduct a deeper study of the mechanisms of action of laser light on the organism with cholelithiasis complicated by chronic cholecystitis - due to the complete absence of any material and partner support for our studies.

The results of the research provide opportunities to create new organ-saving methods for the treatment of cholelithiasis complicated by chronic cholecystitis-conservative (laser therapeutic) and combined (laser-therapeutic and minimally invasive endoscopic) methods.

Acknowledgment

None.

Conflicts of interest

Author declares that there are no conflicts of interest.

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