

Physical therapy of dissecretory syndrome and autonomic disorders in patients with chronic gastritis

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ABSTRACT

Purpose: to investigate the influence of the developed program of physical therapy for patients with chronic gastritis and to evaluate the effectiveness and dynamics of the indices of the secretory function of the stomach and the autonomic nervous system. Material and methods: 30 men were examined, patients with chronic gastritis, the average age of the patients was 25.9 ± 0.8 years in the main group ($n = 15$), and 26.4 ± 0.6 years in the control group ($n = 15$). The men of the main group were engaged in the author's program of physical therapy, the men of the control group – in the program of physical therapy for patients with chronic gastritis according to the method of I.I. Parhotik (2003). Results allowed to analyse the dynamics of the studied parameters under the influence of the program of physical therapy developed by us and to compare the results obtained in the main and control groups. Conclusion: author's program of physical therapy is effective and contributes to a more stable normalization of the secretory function of the stomach and improve the function of the main systems of the body. Keywords: pH-metry, Cerdo index, author's program, men, physical therapy, gastritis. **Keywords:** pH-metry; Cerdo index; Author's program; Men; Physical therapy; Gastritis.

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INTRODUCTION

The incidence of digestive organs in the structure of general morbidity occupies one of the first places, most often affecting people of working age. The causes of diseases are complex and diverse, although the main place is occupied by an infectious factor (Varbanova, Frauenschläger, & Malfertheiner, 2014; Chey, et al., 2017). Had an illness acute intestinal infection cause long-term disorders of the digestive organs. The most common diseases of the stomach and duodenum are gastritis, gastroduodenitis and peptic ulcer (Mosina, et al. 2009).

In the structure of diseases of the gastrointestinal tract chronic gastritis and chronic gastroduodenitis occupy the first place. This is a widespread disease of the digestive system, which affects around 20-30% of the entire adult population in different countries of the world. Among all diseases of the stomach, chronic gastritis accounts for 80-85%. It is believed that the prevalence of chronic gastritis depends on race, place of residence of people and their age (Topchy, et al., 2012; Ermak, et al., 2017). Chronic type A gastritis is quite rare (about 10% of all atrophic gastritis), mainly in two age groups: in the elderly and in children. Chronic gastritis of type B accounts for about 90% of all chronic gastritis, and young and middle-aged men suffer from it much more often than women, but after 60-65 years, these differences disappear (Kalmykov, et al., 2017; Yagura, et al., 2018).

Since the incidence of this disease is steadily increasing, it is not only a common digestive disease, but also a very topical problem of modern gastroenterology (Yang, & Zhang, 2018).

The main feature of chronic gastritis is that this is a morphological concept: solitary gastric mucositis and, at the same time, all the classic morphological signs of inflammation are observed (Singh, et al., 2018). Progression of gastritis is accompanied by a disturbance of the secretory and motor function of the stomach, and the degree of manifestations of this disease depends to a large extent on the activity of the cortical and subcortical centres of the central nervous and autonomic nervous system (VNS), namely, the predominance of sympathetic or parasympathetic divisions (Topchy, et al., 2012; Aruin, 2006).

Long-lasting stress influences the activity of the subcortical centres of the brain and, thus, affects the activity of the gastrointestinal tract with the development of dissection, pain, asthenovegetative, dyskinetic syndromes, causes the appearance of inflammatory changes in the mucous membrane of the stomach (Kalmykov, Kalmykova, & Urdina, 2016). At the same time, in the cerebral cortex, stagnant centres of excitation ("pathological dominant"), which support the pathological process in the mucous membrane of the stomach, are formed. Therefore, the success in the treatment and prevention of relapses of chronic gastritis depends to a large extent on the rapid and complete suppression of these focal points of excitation in the cerebral cortex and the normalization of motor and secretory functions of the stomach (Watari, et al., 2014); Kalmykov, & Sadat, 2015).

Positive results in the treatment of chronic gastritis with the use of drug and non-drug methods of influence are associated primarily with a decrease in the manifestation of morphological signs of the disease (Fedorenko, 2005; Urdina, et al., 2018). At the same time, manifestations of dissecting, dyskinetic and asteno-vegetative syndromes are often characterized by resistance to the used therapy (Kalmykov, Kalmykova, & Urdina, 2016). Drug therapy in chronic gastritis reduces the manifestations of the inflammatory process in the gastric mucosa and does not contribute to the attenuation of congestive foci of the pathological dominant in the cerebral cortex, which occur during long-term disease and play a major role in the pathogenesis of gastric secretory-motor function disorders (Garza-González, et al., 2014). Therefore, the

effect of the treatment of chronic gastritis, namely the reduction of manifestations of dissecretory and dyskinetic syndromes, is observed only when using drug therapy.

In the treatment of chronic gastritis, great importance is attached to the means of therapeutic physical culture (Kalmykov, Urdina, & Pelikh, 2014), helps to reduce inflammatory infiltration of the gastric mucosa and normalizes the function of the gastrointestinal tract. The most important result of the use of physical rehabilitation is not only the treatment of the disease itself, but also the restoration of the functional state of the damaged organ and the whole organism. Therefore, in the rehabilitation process, it is important to take into account the dynamics of changes in the functional parameters of various body systems (Zlatkina, 1994; Kalmykov, Kalmykova, & Urdina, 2016).

METHODS

Participants

30 young people were examined with a diagnosis of chronic type B gastritis in remission, increased secretory function of the stomach on the basis of the Kharkiv City Student Hospital. They were arbitrarily divided into two groups: the main group (MG) – 15 patients and the control group (CG) – 15 patients. The average age of patients in the main group was 25.9 ± 0.8 years, the control – 26.4 ± 0.6 years. The duration of the disease is from 1 to 3 years. In terms of the number of patients, age, and presence of comorbidities, the main and control groups were homogeneous. The disease duration in the main and control groups was 1-3 years. The studies were conducted according to compliance with international documents regulating biomedical research: "Declaration of the Ethnic Principles for Medical Research Involving Human Subjects" (World Medical Association, 2013); "Universal Declaration on Bioethics and Human Rights" (UNESCO, 2005); "The Convention on the Protection of Human Beings", adopted by the Council of Europe (1997).

Measurements

The main method of functional diagnostics in patients with chronic gastritis belongs to the study of gastric secretion by a thin probe and intragastric pH-meter (Sablin, et al., 2002; Leya, 2005; Yakovlev, 2009; Kalmykova, 2014; Yakovlev, et al., 2015).

The course of physical therapy in patients of the main and control groups lasted for 4 months. The analysis and synthesis of the results of the initial and re-examination of the gastric secretory function was carried out according to the results of the pH-metry of the AGM-05K Gastroskan-5 acidogastrometer (manufacturer – NPP Istok-System, city Fryazino, Russia). Evaluation of the data was carried out on the basis of Table 1.

Table 1. State of gastric secretion of the stomach.

State of gastric secretion of the stomach	Level of pH	
	Basal	During stimulation
Hyperacidity, continuous acid formation	0,9-1,5	0,9-1,2
Normalacidity, continuous acid formation	1,6-2,0	1,2-2,0
Hypoacid	2,1-6,0	2,1-3,0
Subanacid	-	3,1-5,0
Anacid	more than 6,0	more than 5,0

Due to the fact that in chronic gastritis the level of gastric secretory function and, consequently, manifestations of this disease depend to a large extent on the activity of the central and autonomic nervous system (ANS), we found it expedient to study the correlation of the functional state (balance or predominance) of the sympathetic and parasympathetic divisions of the ANS (Kalmykov, Kalmykova, & Urdina, 2016). To study the state of the ANS, which would allow the relatively small changes in vegetative activity to be recorded with the help of a simple means, has some influence on the very activity of the organism, we used the definition of the vegetative index Cerdo (V.I.) (Kérdő, 1966). V.I. calculated by Equation 1:

$$V.I. = (1 - d/p) \times 100 \quad (\text{Eq. 1}),$$

where V.I. – vegetative index Cerdo, d/p – the ratio of diastolic pressure / pulse rate. Estimation of the calculation of the Cerdo index are presented in table 2.

Table 2. Estimation of the vegetative index Cerdo

Indicators	Autonomic nervous system region
from +16 to +30	sympathicotonia
$\geq +31$	pronounced sympathicotonia
from -16 to -30	parasympathicotonia
≤ -30	severe parasympathicotonia
from -15 to +15	balance of sympathetic and parasympathetic influences

**Remark: Norm: from -10 to + 10%. A positive index value reflects the predominance of sympathetic regulation. Negative - predominance of parasympathetic regulation.*

Procedures

In order to prolong the remission phase of chronic gastritis of type B, we developed and applied in the main group of patients a program of physical therapy, including therapeutic physical training in the form of therapeutic gymnastics with the use of special physical exercises involving muscle groups innervated by the same segments of the spinal cord as the sick stomach – C3-C4, Th5-Th9, corrective exercises for the spine and regulated breathing exercises, taking into account the tone of the ANS at rest and when walking; morning hygienic gymnastics; self-study and therapeutic massage according to the method of P. B. Efimenko (2013).

In the main group of patients we have introduced therapeutic exercises based on S.A. Kalmykova, Y.S. Kalmykova, G.S. Urdina (Ukraine Patent UA 100691 U, 2015) methodology, which contributes to the normalization of the secretory function of the stomach for a long time and the lengthening of the remission period due to the effect of physical exercises on the subcortical structures of the brain through the formation of intense excitation centres that contribute to the attenuation of stagnant foci of the pathological dominant that arose during the illness and, consequently, increases such way, the effectiveness of the treatment of the disease. The task was solved by the fact that in the method of therapeutic gymnastics and self-study for patients with chronic gastritis, based on performing dynamic and static physical and regulated breathing exercises, depending on the state of the secretory and motor functions of the stomach, the initial tone of the autonomic nervous system is additionally determined by determining the vegetative index Cerdo, and modes of exercise are adjusted depending on the us specified index - eutonia, sympathicotonia, parasympathicotonia, wherein the dynamic and static physical exercises are performed in groups of muscles, innervated preferably the same segments of the spinal cord (C3-C4 and Th5-Th9), and that the patient stomach.

Determination of the vegetative index, taking into account the degree of ANS activity in patients with chronic gastritis before each occupation of therapeutic gymnastics allows to make timely adjustments to the

performance of dynamic and static physical and regulated breathing exercises. Recommended exercise modes for physical and breathing exercises depend on the value of V.I. and motion state.

The basis of the complexes of therapeutic gymnastics and self-study were general developmental physical exercises, corrective exercises for the spine and breathing exercises at rest and during walking, which were performed by patients during the three parts of the lesson - preparatory, main and final:

- In the preparatory part of each session, the patients used dynamic physical exercises, providing a general strengthening effect; excite the central nervous system; increase the mobility of the joints of the extremities, the spine and the chest; prepare the patient for the main part of the complex. The preparatory part of the therapeutic gymnastics complex was general-development exercises for all muscle groups of the extremities performed at a slow pace with full amplitude from the initial positions "sitting" and "standing" in combination with pauses of rest and breathing exercises.
- At the end of the preparatory part, in order to increase resistance, normalize the secretory function of the stomach and psychological state, patients perform breathing exercises while walking, taking into account certain activity of the sympathetic or parasympathetic divisions of the autonomic nervous system: in order to reduce sympathicotonia, inhale - by 2-3 steps, exhale 4-6 steps to hold your breath for 5-15 s; in order to reduce parasympathicotonia, inhale - by 4 steps, exhalation - by 2-3 steps with breath holding at the height of inhalation for 5-15 s; when determining the eutonic state (balance of activity of the sympathetic and parasympathetic divisions of the ANS) - the duration of inhalation and exhalation are the same without breathing delays.
- Final part of the therapeutic gymnastics complex consisted of walking around the gymnastics room at a slow pace, combined with relaxation exercises and breathing exercises for 1-3 minutes.

All exercises were performed: with a full amplitude at a slow and average pace; from the starting positions of "standing" and "walking"; the number of repetitions 8-12 times; in every 3-4 general developmental and breathing exercises, the complexes included rest pauses and relaxation exercises; lesson duration 30-50 minutes.

Used therapeutic massage according to the method of P. B. Efimenko (2013): a light relaxing massage the back and front surfaces of the body, including the stomach.

In the control group, men were engaged in a physical therapy program for patients with chronic gastritis according to the method of I.I. Parhotik, (2003), used a therapeutic massage according to L.A. Kunichev(1985).

Statistical analysis

The processing of the results of the research was carried out using the "Data Analysis" package of Microsoft Excel spreadsheets. Indicators of descriptive statistics (mean arithmetic mean, standard deviation and error of average value) were determined. The statistical reliability of differences in mean values was estimated by the Student's test, the differences were considered reliable when ($p < 0,05$).

RESULTS

Initial examination of patients was carried out before the start of a course of physical therapy. Analysis of the results of the pH - metry of the stomach showed that in the patients of both groups the phenomena of hyperacidity prevailed in combination with continuous acid production (Table 3). Stomach secretion on an

empty stomach in the main group was 1.31 ± 0.06 , in the control group - 1.26 ± 0.06 ; stimulated in the exhaust gas was 1.09 ± 0.04 , in the CG - 1.10 ± 0.04 ($p > 0.05$). In the main group, fasting normoacidism occurred in 3 patients (20.0%), in the CG - in 2 (13.3%) patients; in the MG, normoacidism during stimulation was observed in 2 patients (13.3%), in the CG - in 1 patient (6.7%).

Table 3: Indicators of gastric secretion when before experiment the main (n = 15)

and control (n = 15) group ($\bar{X} \pm m$)

Indicators	Gastric secretion	Norm	Surveyed group		t-criterion of Studentt	p
			Main Group, (n=15)	Control Group, (n=15)		
State of acid formation in the stomach	on an empty stomach	1,6-2,0	$1,31 \pm 0,06$	$1,26 \pm 0,06$	0,58	$> 0,05$
	stimulated	1,2-2,0	$1,09 \pm 0,04$	$1,10 \pm 0,04$	0,16	$> 0,05$

In determining the vegetative Cerdo index, we found 13 men from parasympathicotonia and 2 patients with sympathicotonia among men of the main group, sympathicotonia in 2 men and 2 parasympathicotonia in the control group. Eutonia in the primary examination of men OG was not determined, in the control group the balance of the sympathetic and parasympathetic divisions of the ANS we observed in 1 patient (Fig. 1).

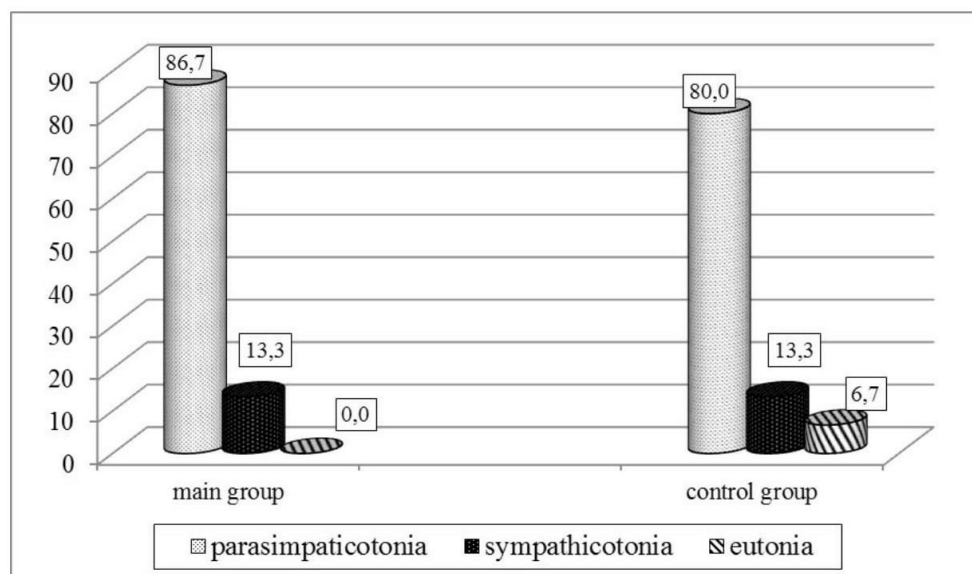


Fig. 1. Activity of the autonomic nervous system in patients of both groups during the initial study (%)

The data obtained also indicate that the shift of the vagal-sympathetic balance towards the weakening of the sympathetic one and the dominance of the parasympathetic tone in the patients of both groups, which is confirmed by the magnitude of the vegetative Cerdo index: $(-7,00 \pm 1,23 \text{ s. u.})$ in patients with MG and $(-4,4 \pm 1,47 \text{ s. u.})$ in patients with CG ($p > 0,05$) (Table 4).

Table 4. Cerdo index in patients of both groups during the initial study ($\bar{X} \pm m$)

Indicators	Surveyed group		t-criterion of Studentt	p
	Main Group, (n=15)	Control Group, (n=15)		
Cerdo index, s. u.	- 7,00±1,23	- 4,4±1,47	1.35	>0,05

After four months of using the means of physical therapy, certain changes occurred in the general condition of the patients of both groups - improvements in the secretory function of the stomach were found in patients of both groups (Table 5). In patients of the main group, we observed normalization of gastric secretory function on an empty stomach and stimulated one: according to $1,73 \pm 0,04$ i $1,48 \pm 0,04$ ($p < 0,05$). In the control group, there was also an improvement in the basal and stimulated secretory function: according to $1,44 \pm 0,05$ i $1,26 \pm 0,04$ ($p < 0,05$). In addition, when repeated research in the MG, normatsidnist on an empty stomach occurred in 100% of patients, in the CG - in 33.3% of patients (5 cases) in the MG, normatsidnist during stimulation was observed in 100% of patients, in the CG - in 73.3% of patients (11 cases).

Table 5: Indicators of gastric secretion in the primary and repeated research in the main and control groups ($\bar{X} \pm m$)

Indicators	Gastric secretion	Norm	Group	Before experiment $\bar{X} \pm m$	After experiment $\bar{X} \pm m$	t-criterion of Student	p
State of acid formation in the stomach	on an empty stomach	1,6-2,0	Main	1,31±0,06	1,73±0,04	5,78	<0,05
			Contro l	1,26±0,06	1,44±0,05	2,45	<0,05
	stimulated	1,2-2,0	Main	1,09±0,04	1,48±0,04	6,63	<0,05
			Contro l	1,10±0,04	1,26±0,04	2,61	<0,05

When comparing repeated indicators of acid formation in the stomach on an empty stomach and after stimulation in both groups, we found a statistically significant improvement in the main group compared to the control group, indicating a more stable normalization of the secretory function of the stomach under the influence of the proposed author's program of physical therapy in the main group of patients (Table 6).

Table 6: Comparative characteristics of indicators of gastric secretion in both groups of patients in repeated research ($\bar{X} \pm m$)

State of acid formation in the stomach	Surveyed group		t-criterion of Student	p
	Main Group, (n=15)	Control Group, (n=15)		
on an empty stomach	1,73±0,04	1,44±0,05	5,04	<0,05
stimulated	1,48±0,04	1,26±0,04	3,92	<0,05

After applying the means of physical rehabilitation in both groups, changes in the activity of the vegetative nervous system were revealed. When determining the vegetative Cerdo index after using the means of

physical rehabilitation, we found equilibrium in both sections of the ANS in 9 patients (60.0%) of the main group and in 5 patients (33.3%) of the control group. Repeated examination of patients with parasympathicotonia in the MG is not detected (during the initial examination – 13 (86.7%) in CG by repeated examination parasympathicotonia observed in 6 (40.0%) patients (during the initial - 12 (80.0%) (Fig. 2).

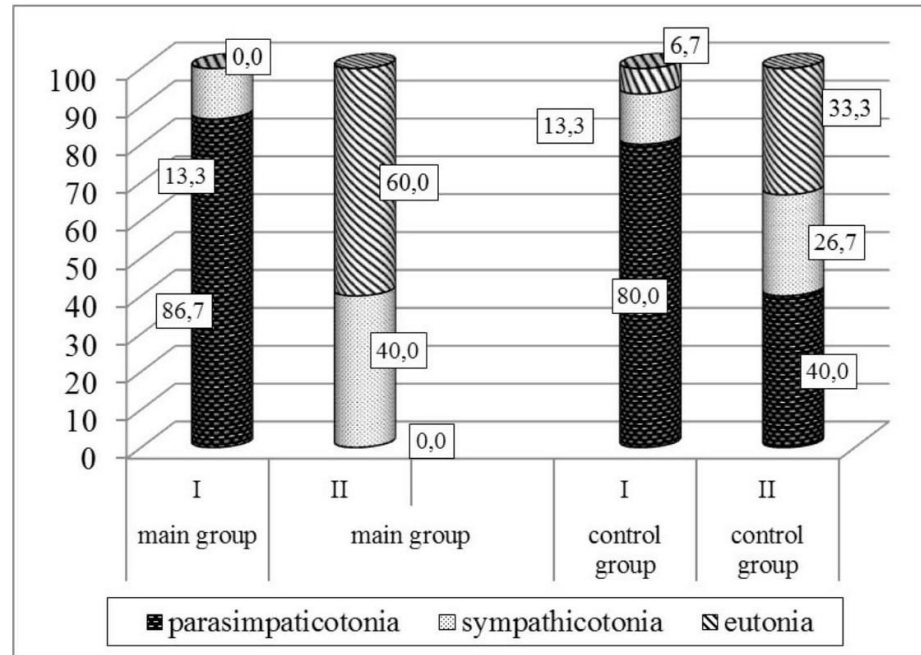


Fig. 2. Activity divisions of the autonomic nervous system in patients of both groups in the primary and repeated research (%)

The obtained data indicate a shift in the vagal-sympathetic balance towards weakening of the parasympathetic and domination of the balance of the ANS tone in patients of the main group, as evidenced by the value of the Cerdo vegetative index: in the MG - ($+ 1.87 \pm 0.76$), in the CG - ($-0,2 \pm 1.26$) ($p < 0.05$) (Table 7).

Table 7. Cerdo index in patients of both groups in the primary and repeated study ($\bar{X} \pm m$)

Indicators	Group	Norm	Before experiment $\bar{X} \pm m$	After experiment $\bar{X} \pm m$	t-criterion of Student	p
Cerdo index, s. u.	Main	$0 \pm 0,15$	$-7,00 \pm 1,23$	$1,87 \pm 0,76$	6,13	$< 0,05$
	Control		$-4,40 \pm 1,47$	$-0,2 \pm 1,26$	2,17	$< 0,05$

When comparing the Cerdo index in a repeated study in both groups, we found a statistically significant difference in the main and control groups, which indicates a greater positive impact of the author's program of physical therapy on the ANS tone (Table 8).

Table 8. Cerdo index in patients of both groups with repeated research ($\bar{X} \pm m$)

Indicators	Norm	Surveyed group		t-criterion of Student	p
		Main Group, (n=15)	Control Group, (n=15)		
Cerdo index, s. u.	0±0,15	1,87±0,76	-0,2±1,26	1,81	<0,05

DISCUSSION

The basis of the restoration of the functions of the internal organs is the mechanism of the motor-visceral reflexes, which are closely associated with nervous and humoral factors. In addition, psychological factors play an important therapeutic role. The very appointment of a complex of physical therapy exercises to a patient increases his confidence in the favourable outcome of the disease, improves neuropsychic condition (Epifanov, 2006). Action of exercise used in therapeutic physical training (physical therapy), based on their ability to stimulate and normalize the physiological processes in the body. They have a beneficial effect on the nervous system, trophism of tissues, contribute to the improvement of the functions of the nervous and muscular systems, internal organs. Under the influence of physical exercises, functional reorganization of organs and tissues is accelerated, it contributes to the compensation of impaired functions (Sokrut, Kazakov, & Povazhnaya, 2003; Murza, 2004).

It is known that the implementation of dosed physical exercises, which is accompanied by positive changes in the functional state of the centres of the pidbugorni region and an increase in the level of basic life processes, causes positive emotions (psychogenic, conditioned reflex effects). This is especially relevant in chronic gastritis, when the neuropsychological condition of the patients leaves much to be desired (normalization of dystonia in the nervous system expressed in patients) (Efimova, 2002). With regular exercise, energy reserves gradually increase, the formation of buffer compounds increases, the body enriches with enzyme compounds, vitamins, potassium ions and calcium. This leads to the activation of redox processes and an increase in the stability of acid-base balance, in turn, has a positive effect on the reduction of the inflammatory process in the gastric mucosa (effect on trophic and regenerative processes) (Epifanov, 2002; Murza, 2004).

The most important and most important in questions of rehabilitation of persons with pathology of digestive organs is the determination of the motor regimen, the intensity and duration of physical activity. Despite the long history of the problem and the large number of works devoted to it, there are contradictory data on the influence of muscular activity on the functions of the digestive system. So, L. Orbely (1942, 1949) in experiments on dogs with isolated stomach in Pavlov found that intensive muscular loading (running 30 min. in a wheel) sharply inhibits the nervous phase of gastric secretion, namely: the total amount of gastric juice decreases, its acidity decreases. The mechanism of these phenomena, according to the authors, depends on the central inhibitory effects and on the redistribution of blood at the moment of muscular activity. On the contrary, moderate habitual work, for example, quiet walking, stimulates the secretion of acid (Moshkov, 1977; Sokrut, Kazakov, & Povazhnaya, 2003).

It is believed that the cause of the increase in HCL secretion (Stepanov, & Kushnirenko, 2015) in patients with chronic gastritis during physical work is to increase the tone of the vagus nerves, increase the release

of gastrin, increase the sensitivity of the H₂-histamine receptors in the absence of suppressing factors, which increase the secretion of acid during exercise in healthy people.

According to V.M. Sokrut, V.M. Kazakova and E.S. Povazhnaya (2003), inclusion of physical therapeutic factors in the complex therapy of chronic gastritis shown in chronic gastritis with dissekretornim, dyskinetic syndromes and neurotic disorders. The choice and purpose of forms and means of exercise therapy in the complex treatment of chronic hepatitis is to establish the leading syndrome, the phase of the process, the predominant nature of violations of the secretory and / or motor function of the stomach.

According to I.I. Parhotik (2003) in the physical rehabilitation of patients with chronic gastritis, motor regimens and the stages of rehabilitation treatment are of great importance. Proceeding from this, the following motor regimes are distinguished: the inpatient clinical department is sparing, bed rest, ward, free; inpatient rehabilitation department - free sparing, sparing-training, training; clinic, dispensary, sanatorium: sparing, sparing-training training. The repetition of some modes of physical activity at different stages of treatment, according to the author, is caused by the need to implement at each stage the principle of continuity in the physical rehabilitation of patients, taking into account the clinical condition of the patient and his physical fitness.

According to S.M. Popova (2005, 2008) exercise therapy in the acute phase of chronic gastritis is prescribed in the hospital for half-bed mode. As soon as the exacerbation subsides, exercises are assigned to improve blood circulation in the abdominal cavity and create favourable conditions for regenerative processes, improve trophism of the gastric mucosa, influence the secretory and motor functions of the stomach and the neurohumoral regulation of the digestive processes.

V.A. Epifanov (2002, 2005, 2006) proposes to divide the treatment of chronic gastritis into two parts. In the first half of the course of physical therapy in the PT classes, general developmental and special exercises are used. General developmental exercises have a tonic effect on the central nervous system, improve the function of the digestive organs and metabolism. As special exercises, exercises are used for the muscles surrounding the abdominal cavity; muscle relaxation and breathing exercises. Exercises for the abdominal muscles are assigned according to the phase of the disease. They are shown, if necessary, to increase peristalsis, gastric secretory function and the bile outflow. In the acute and subacute stages, they are contraindicated. Exercises aimed at relaxing the muscles, reduce the tone of the muscles of the stomach and intestines, relieve spasms of the pylorus and sphincters. Respiratory exercises on the diaphragmatic type provide a massaging effect on the liver, stomach and intestines.

However, the existing methods of physical therapy (Moshkov, 1977; Efimova, 2002; Epifanov, 2002, 2005, 2006; Sokrut, et al., 2003; Murza, 2004; Popov, 2005, 2008) do not take into account the significant effect of vegetative innervation on the motor, secretory and suction functions of the stomach. Normalization of acid-producing functions of the stomach occurs immediately after the application of exercise therapy and is not long-term. In the scientific literature there is no information about the combined use of massage and exercise in this disease. All of the above necessitates the development and evaluation of a new physical therapy program that would contribute to the achievement of sustained remission of chronic gastritis of type B, normalization of the sour-to-stomach function of the stomach (Burdin, Minushkin, Zverkov, Volodin, et al., 2008). Therefore, the treatment of chronic gastritis should be comprehensive and include diet therapy (Festi, et al., 2009), drug therapy (Shi, et al., 2015), phytotherapy (Kalmykov, 2008), oxygen therapy (Dryden, 2018), drinking mineral water, physiotherapy (Yakovenko, & Samoilenko, 2011), massage (Hai, X., et al., 2015), physical therapy (Kalmykov, 2016; Kalmykov, Kalmykova, Sadat, 2017), psychotherapy (Voronov, 2002).

CONCLUSIONS

Due to the lack of effectiveness of standard treatment methods, increasing the allergisation of the population and the adverse effects of prolonged medical stress on the human body, the characteristics of chronic gastritis, it is necessary to use rehabilitation programs based on non-pharmacological effects, which would contribute to the long-term normalization of gastric and motor function of the stomach, lengthening the time of remission due to normalizing effects on the autonomic nervous system and subcortical structures brain.

The results of the study indicate a more significant improvement in the absorbing function of the stomach and metabolism as a result of the use of the author's program of physical therapy, helps normalize the secretory function of the stomach for a long time and lengthen the time of remission due to the influence of physical exercises on the subcortical structures of the brain by forming intensive foci of arousal, which contribute to the attenuation of stagnant lesions of the pathological dominant that have arisen in the process of the disease, and after impressively increases, therefore, effective in treating disease.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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