Treatment of patients with progressive myopia with traditional medicine and physiotherapy

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RESUME

Myopia is a disease of civilization, which affects one-third of the world's population. It is the most common cause of disability and loss of ability to work at a young age. Therefore, the search for new ways of treating the disease is currently important.

The purpose of this paper is to summarize the use of traditional medicine techniques and physiotherapy in the treatment of patients with progressive myopia.

Keywords: ophthalmology, traditional medicine, reflexology, bioresonance therapy, physiotherapy, myopia.

SUMMARY

Myopia is a "disease of civilization" that affects one third of the world's population. It is the most common cause of disability and disability at a young age. In view of this, it is urgent to search for new methods of treating this disease.

The aim of the work was to summarize the data on the use of methods of traditional medicine and physiotherapy in the treatment of patients with progressive myopia.

Key words: ophthalmology, traditional medicine, reflexology, bioresonance therapy, physiotherapy, myopia.

INTRODUCTION

Myopia is rightfully considered a "disease of civilization." Its steady growth is facilitated by computerization, television, a sedentary lifestyle, and early start of schooling. According to medical statistics, one third of the world's population suffers from myopia. The share of myopia in the nosological structure of visual disability in Russia reaches 18% (3rd place), and among the causes of disability in young people it takes the second place. About 20 out of a hundred Russians need treatment for myopia [1].

So what is myopia or, as it is also called, myopia?

Myopia is a common refractive error, in which the image of objects is formed in front of the retina. This can be associated either with the refractive power of the cornea and lens that is too strong for a given optical axis of the eye (refractive myopia), or with an increase in the anteroposterior axis of the eye (axial myopia). Most often, a combination of these two points is observed. As a result, the focal length decreases, the light rays converge in front of the retina, and a person clearly sees only objects that are in close proximity to him (Fig. 1) [2].

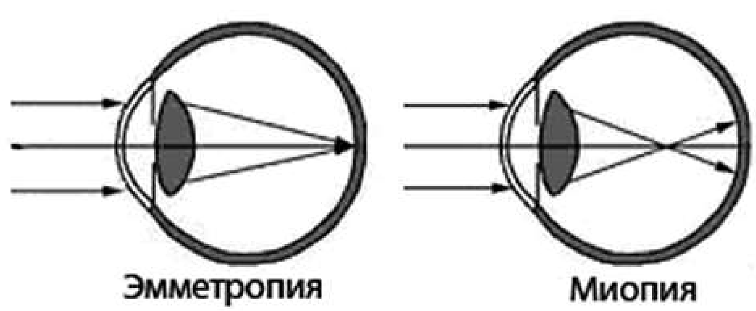


Fig 1. Comments: In an emmetrope, the image is focused on the retina, in a myopa - in front of it.

There is an opinion that by the origin and course of myopia is heterogeneous and two of it can be distinguished basic forms. One of them is a biological variant of normal refractogenesis with insignificant fluctuations in the combinations of various anatomical and optical elements of the eye, corresponding to a relatively small degree of myopia - "simple" myopia

("Commensurate") (according to AI Dashevsky, 1962), "physiological school myopia" (according to VV Volkov, 1988), "component myopia" (according to A. Sorsby, 1962). Another form of myopia - "pathological" ("malignant", "myopic disease"), as a rule, is accompanied by a significant lengthening of the anteroposterior axis of the eye and is often combined with various complications (Volkov V.V., 1988; Curtin V., 1985).

A special form of myopia is congenital myopia, which is associated with various malformations of the eyeball and is formed by the time the child is born. Its frequency, according to various authors, ranges from 1.4 to 4.5% among patients with myopia. Often this form of myopia is accompanied by low vision associated with organic changes in the light-receiving apparatus.

The causes of myopia are not fully understood. Several risk factors have been identified, namely:

A) Genetic factor.

Statistics show that if both parents are nearsighted, then in 50% of cases before the age of 18, their children develop myopia. It is believed that hereditary factors determine a number of defects in the synthesis of connective tissue protein (collagen), which is necessary for the structure of the scleral membrane of the eye.

B) Unfavorable environmental conditions leading to eye strain (long-term work at close distance, poor lighting of the workplace, improper sitting position when reading and writing, excessive interest in TV and computer).

C) Primary weakness of accommodation, leading to compensatory stretching of the eye.

D) Unbalanced tension of accommodation and convergence, causing a spasm of accommodation and the development of false and then true myopia [3, 4].

According to the severity, myopia is subdivided into:

- weak - up to 3 diopters;
- medium - up to 6 diopters;
- high - over 6 diopters.

According to the rate of progression, myopia is:

A) stable (increase by no more than 0.5 diopters per year); B) slowly progressive (increase up to 1 diopters per year); C) rapidly progressing (an increase of more than 1 diopters per year).

Myopia progresses most intensively in children during school years, during the period of the most intense visual stress. In some cases, lengthening of the eyeball in the anteroposterior direction can take on a pathological character, causing deterioration in the nutrition of the eye tissues and the development of complications (Fig. 2, 3, 4):

1) myopic cone;

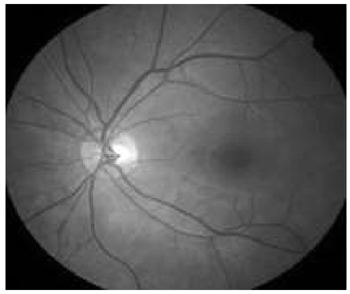
2) false posterior staphyloma - dystrophy of the choroid and reticular membranes, capturing the entire the circumference of the optic nerve head;

3) true posterior staphyloma - the formation of a limited protrusion of the eyeball due to stretching of the posterior segment of the sclera near the optic nerve;

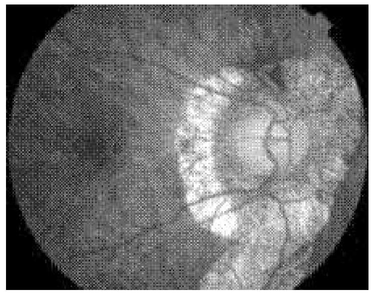
4) repeated hemorrhages in the retina and vitreous body, opacity of the vitreous body;

5) retinal detachment.

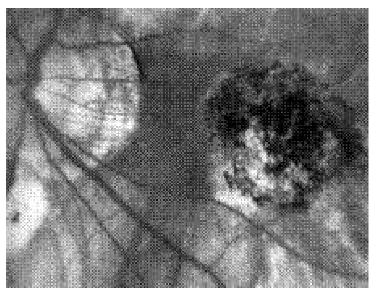
The progression of myopia gradually leads to irreversible changes in the central parts of the retina and a significant decrease in visual acuity up to the patient's disability [5, 6, 7].



Rice. 2. The fundus of a healthy person.



Rice. 3. Dystrophic changes on the retina with myopia (false posterior staphyloma - dystrophy choroid and retina with the capture of the entire circumference of the optic nerve head).



Rice. 4. Dystrophic changes on the retina in myopia (false posterior staphyloma and secondary macular degeneration in the form of a Fuchs spot).

MATERIALS AND METHODS

In our department, for the treatment of patients with progressive myopia, magnetotherapy and magnetophoresis of drugs are widely used, which improve blood flow and metabolic processes in the tissues of the eye, relieve tension from the ciliary muscle (Taufon 4%, riboflavin mononucleotide 1%, Mesaton 1%, etc.).

Magnetophoresis is carried out on the "Pole-3" apparatus with an exposure intensity of 10 mT and an exposure time of 10 minutes. The course of treatment consists of 10 daily sessions.

In the treatment of patients with progressive myopia, endonasal electrophoresis is widely used, with the help of which drugs are delivered directly to the posterior pole of the eye. For the treatment of dystrophic changes in the fundus, to strengthen the sclera and relieve spasm of the ciliary muscle, riboflavin-mononucleotide 1%, no-spa 2%, calcium chloride 2%, retinalamin are used [8]. Electrophoresis is carried out on a domestic Potok-1 galvanizer with a current strength of up to 1mA, the procedure time varies from 10 to 15 minutes, depending on the patient's tolerance, the course consists of 10 daily sessions. The polarity is set in accordance with the developed tables.

Myopia often occurs in children against the background of general weakness of the connective tissue, manifested by impaired posture, flat feet, etc. Most children with myopia are characterized by a decrease in immunity (frequent ARVI, childhood infections, chronic tonsillitis, sinusitis), the presence of chronic diseases of the liver, gallbladder, etc. [9, 10, 11, 12, 13]. Therefore, it is relevant to use treatment methods that allow not only to influence the organ of vision, but and to normalize the somatic state of patients. These methods include acupuncture and bioresonance therapy [14].

In the treatment of myopia, we are based on modern, generally accepted ideas about the autonomic-reflex effect of reflexotherapy, put forward in 1936 by A.E. Shcherbak.

A specific feature of acupuncture (AP) or acupuncture (IRT) is the extremely small (point) area of irritation. When exposed to acupuncture points (AT), a reflex response occurs, which assumes the presence of 3 interrelated components: local, segmental and general.

The local reaction to the introduction of the needle into the point is expressed in a change in skin color, temperature, increased blood flow, the appearance of an edematous ridge at the site of acupuncture. This is a typical reflex reaction involving afferent and efferent pathways.

The segmental reaction is expressed in the direct reaction of the structures of the spinal cord segment and the inclusion of reflex connections of the autonomic nervous system (ANS) with various internal organs, vessels, muscles of this segment and adjacent segments of the spinal cord (E.L. Macheret, I.Z. Samosyuk, 1989) ...

The general generalized reaction arises as a result of the receipt of signals from the periphery to the suprasegmental parts of the central nervous system - to the cortical-subcortical structures of the brain, the reticular formation, causing the activation of the hypothalamic-pituitary-adrenal system. This leads to the propagation of impulses along specific and nonspecific pathways, and also causes a pronounced neurohumoral response.

The main links in the mechanism of action of IRT in myopia are the normalization of blood supply and microcirculation in the tissues of the eye, improvement of eye trophism by activating the structures of the autonomic nervous system, neuroreflex stimulation of the subcortical and cortical structures of the visual analyzer, removal of spasm or hypertonicity of accommodation.

In ophthalmology, important reflexogenic zones are the area of innervation of the 1st and 2nd branches of the trigeminal nerve and the so-called "collar" zone (according to L.E. Shcherbak), which is the most accessible for influencing the cervical sympathetic center of innervation of the soft tissues of the face and head [15, 16, 17, 18].

All three of the aforementioned types of reactions are also characteristic of manual therapy and various types of massage, since these methods of treatment, by the nature of their effect, are specific types of reflexology. All these methods are characterized by a percutaneous effect on reflexogenic zones and ATs located subcutaneously and in deeper loci of the musculoskeletal system (ODS), however, there are significant differences between these methods in terms of the strength and effectiveness of exposure, points and areas of application.

Segmental massage (SM) is carried out according to the principles of general massage in individual, most important segments of the body, taking into account the segmental structure of the body. The impact is carried out on large reflexogenic zones of the skin, as well as the underlying muscles with moderate intensity. In our case, SM has a preparatory character for carrying out subsequent manual therapy techniques [19].

Acupressure massage (TM) is the closest to acupuncture, because the effect is carried out pointwise on the AT skin projection with varying intensity and duration.

Manual therapy (MT), acting on the most important and most reactive structures of the ODS - muscles, fascia, ligaments, joints, is the fastest and most effective method of eliminating functional disorders in this area (MT is sometimes called "bloodless surgery"), as well as the entire symptom complex of disorders surrounding and reflexively reacting organs and tissues [20, 21].

Despite the apparent independence of the state of the organ of vision and the musculoskeletal system, there is a certain correlation between them.

Often, the development of eye pathology is caused by disturbances in intracranial hemodynamics, which are a consequence of pronounced dystrophic changes in the spinal motion segments of the cervical and cervicothoracic regions with symptoms of cervical and cervicothoracic osteochondrosis, after craniocervical trauma, incl. in patients with arterial hypertension after concussion of the brain and spinal cord.

One of the pathological links in the development of myopia is congenital weakness of the sclera, which is a particular manifestation of systemic weakness of the connective tissue. A decrease in scleral resistance is also associated with impaired calcium metabolism (V.N. Kolosov, 1982), a general increase in catabolic processes in the connective tissue in adolescents (M.I. Vinetskaya, 1989).

Therefore, children and adolescents with myopia often have certain problems with ligaments and joints: these are posture disorders, especially kyphoscoliosis and its entire symptom complex, flat feet, a tendency to sprain and rupture of ligaments in typical places, hypermobility of joints, etc.

In addition, it has been established that functional blockages of the intervertebral joints and, above all, the craniovertebral junction, are of great importance in the origin of myopia in children. According to M.A. Kuznetsova. (1994, 1997), the use of MT promoted an increase in the supply of accommodation in 97.7% of children and stabilization of myopia in 80.4% within 3-5 years. In adults, such high effects were not observed, but subjective improvement in visual functions after MT was noted by the majority of patients, which is usually explained by an improvement in hemodynamics in the vertebrobasilar region [22].

MT is used both independently as an effective stimulating technique, and in the complex treatment of patients with various diseases of the organ of vision, being an excellent way to mobilize the reserve capacities of the body and create an optimal background for the use of other specific therapeutic techniques, such as physiotherapy, AP, and other types of resonance methods of treatment. MT can be easily combined with AP, enhancing and potentiating the therapeutic effect, because the mechanism of action here is largely similar.

In recent decades, bioresonance therapy (BRT) has been successfully used in patients with progressive myopia: adaptive (endogenous) BRT and multiresonance therapy with fixed frequencies (exogenous BRT). This type of treatment helps to activate the functions of nerve fibers and neurons of the visual analyzer, which are in a state of parabiosis, which does not allow responding to drug treatment and other types of exposure. BRT has anti-inflammatory, immunomodulatory, trophic effects, improves the state of the body's adaptive reserves, increases blood flow [23, 24, 25, 26, 27].

BRT is performed on an outpatient basis 2-3 times a week using the device for adaptive bioresonance therapy "IMEDIS-BRT-A". Therapy with specific frequencies is carried out on the apparatus for electro-, magnetic and light therapy according to BAT and BAZ "MINI-EXPERT-DT". The course of treatment consists of 10 procedures. The duration of the session varies, depending on the program, from 20 to 40 minutes.

For multiresonance therapy, the frequencies of spontaneous bioelectric activity of organs and tissues are used, taken from the databases of R. Voll, P. Schmidt, R. Rife and affecting the organ of vision. For the treatment of progressive myopia, frequencies are used: 3.6 Hz; 4.9 Hz; 31.5 Hz, 64 Hz; 70 Hz; 70.5 Hz; 95 Hz.

We present the clinical characteristics of patients with progressive myopia treated with bioresonance therapy.

We observed 240 patients (480 eyes) with progressive myopia at the age from 3 to 18 years (mean age 10.5 ± 7.5 years). Of them, boys - 102 (42.5%), girls - 138 (57.5%).

The follow-up period ranged from 1.5 to 6 years (on average 3 years); the criterion for stabilizing myopia was a decrease in the annual gradient of progression, an increase in the reserve of relative accommodation (RHA), a decrease in subjective refraction, and an improvement in visual functions of the retina.

Before adaptive bioresonance therapy (BRT), electropuncture diagnostics were performed using the autonomic resonance test (ART) method and R. Voll's method, which helped to identify functional abnormalities in the work of internal organs and select individual frequency therapy programs.

BRT was performed on an outpatient basis every day or 2-3 times a week using the device for adaptive bioresonance therapy "IMEDIS-BRT-A". Therapy with specific frequencies was carried out on the apparatus for electro-, magnetic and light therapy according to BAT and BAZ "MINI-EXPERT-DT". The course of treatment consisted of 10 procedures. The duration of the session varied, depending on the program, from 20 to 40 minutes.

Initially, BRT was performed in all organs and systems, and then the impact on those of them that were in the state of the greatest decompensation in accordance with the data of ART and EPD was performed.

When conducting multiresonance magnetotherapy, the frequencies of spontaneous bioelectric activity of organs and tissues were used, taken from the databases of R. Voll, P. Schmidt, R. Rife (6, 16) and affecting the visual analyzer, various parts of the visual tract, and other brain structures that were selected individually for each patient during EPD.

In the course of treatment, repeated testing according to R. Voll was carried out and, if necessary, treatment was corrected depending on the received EPD data.

During the indicated follow-up period, the patients did not receive any additional therapy. The functional state of the eyes, including the examination of visual acuity, the study of subjective and objective refraction, the reserve of relative and absolute accommodation, was determined before the appointment of BRT and 1, 2, 3 and 6, 12 and 24 months after its termination. Biomicroscopy and ophthalmoscopy were performed at the same time intervals. Before the course, as well as 12 and 24 months after it, the anteroposterior axis of the eye (APO) was measured.

RESULTS AND ITS DISCUSSION

As a result of the therapy, there was a decrease in asthenopic complaints, an increase in visual performance. The majority of patients showed a decrease in the average annual gradient of progression (GGP) of myopia and an improvement in the functional parameters of the visual analyzer (diagram 1, tables 1, 2).

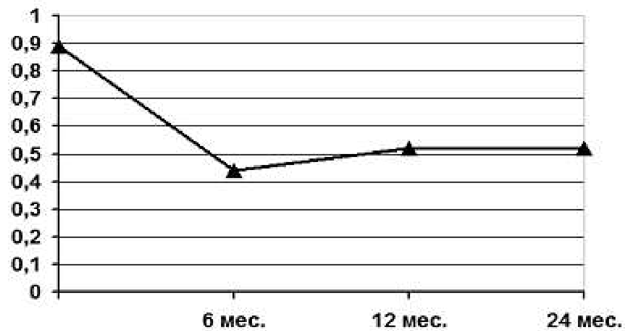


Diagram 1. Dynamics of the average annual gradient of progression against the background of repeated courses of bioresonance therapy.

Table 1

The dynamics of subjective and objective refraction against the background of repeated courses of bioresonance therapy

Сроки наблюдения	Стабилизация рефракции				Ослабление рефракции				Усиление рефракции			
	субъективной		объективной		субъективной		объективной		субъективной		объективной	
	кол-во глаз	%	кол-во глаз	%	кол-во глаз	%	кол-во глаз	%	кол-во глаз	%	кол-во глаз	%
14 дн.	211	43,3	480	100	256	55,7	-	-	13	2,7	-	-
6 мес.	224	46,7	384	80	241	50,2	-	-	15	3,1	96	20
12 мес.	223	46,5	380	79,2	237	49,3	-	-	20	4,2	100	20,8
24 мес.	214	44,6	349	72,7	159	33,1	-	-	107	22,3	131	27,3

отличия между показателями до и после лечения достоверны ($p < 0,001$)

table 2

Dynamics of the stock of relative accommodation against the background of repeated courses of bioresonance therapy

Показатель	14 дней			6 мес.			1 год			2 года		
	↑	↓	без изм.	↑	↓	без изм.	↑	↓	без изм.	↑	↓	без изм.
Число больных	169	-	71	170	3	67	158	7	75	160	9	71
Среднее значение	2,23±0,25	-	-	2,8±0,15	0,5	-	1,9±0,25	1,0±0,25	-	2,5±0,17	0,6±0,13	-

отличия между показателями до и после лечения достоверны ($p < 0,001$).

When analyzing the table. 1 and 2, we see that subjective refraction decreased in 256 eyes (55.7%) by an average of 0.54 ± 0.08D, in 13 (2.7%) eyes it increased by 0.3 ± 0.07, in the rest of the eyes remained without dynamics. Subjective refraction increased in 15 eyes by an average of 0.2 ± 0.12, while its decrease remained in 241 eyes.

Objective refraction in conditions of cycloplegia (two times Cyclomed 1%) in 96 eyes increased by 0.25–0.5 D, on average by 0.28 ± 0.06 D, in the rest of the eyes it remained unchanged.

Thus, the progression of myopia before a second course of treatment 6 months after the first course was noted in 24.2% of the eyes with an average rate of progression of 0.44 D per year.

This indicates a 2.5-fold decrease in the initial GGP. No baseline rate of myopia progression was observed in either eye. After a year of observation (6 months after the repeated course), objective refraction remained stable compared to the initial level in 380 (79.2%) eyes.

30 patients were followed up for 6 years. At the beginning of the observation, they underwent 2-3 courses of bioresonance therapy with an interval of 6 months. Over the entire observation period, objective refraction remained stable in 26 (86.7%) patients. In 2 (6.7%) patients, the rate of myopia progression during therapy became lower than the initial one, but exceeded 1.0 D per year, and therefore they were referred to a surgeon for scleroplasty. In the remaining 2 patients, the rate of progression was reduced (less than 0.5 D in 6 months), they were prescribed repeated courses of BRT until complete stabilization (3 additional courses).

The reserve of relative accommodation (RHA) increased in 211 patients (88%) by an average of 0.95 ± 0.25D (maximum by 3.0D). In congenital myopia, the ZOA practically did not change. Only in 4 patients did it increase to 0.5D.

One of the reliable criteria for the effectiveness of the treatment of progressive myopia is the stabilization of the PZO parameters. This indicator was analyzed in 120 patients (240 eyes) at 12 and 24 months from the start of treatment. Its stabilization during the first year of observation was noted in 216 eyes (90%), and after 2 years in 208 (88%). The data are presented in table. 3.

In 89% of cases, the existing dystrophic changes in the fundus did not progress, and in their absence before the start of treatment, their appearance was not noted.

CONCLUSIONS

Thus, physiotherapy and traditional medicine can be successfully used to treat patients with progressive myopia. BRT with preliminary electropuncture diagnostics according to R. Voll's method is effective in treating patients with progressive myopia and has a number of advantages:

- the use of BRT in the treatment of patients with progressive myopia makes it possible to obtain stable long-term positive therapeutic effect in 70–90% of cases, depending on the form and stage of the disease;
- the use of the method helps to reduce the rate of progression of myopia, improve visual functions, an increase in visual performance, stabilization of dystrophic changes in the fundus, which leads to an increase in the level of social and professional rehabilitation in this group of patients;
- the introduction of the method into ophthalmological practice allows to increase the effectiveness of treatment progressive myopia in the most severe cases of resistance to conventional therapy in complex pharmacotherapy;
- the BRT method is non-invasive, has no side effects and significant age restrictions and the somatic status of patients.

Table 3

Dynamics of the magnitude of the anteroposterior axis of the eye against the background of repeated courses of bioresonance therapy.

Сроки наблюдения	Частота стабилизации ПЗО		Частота увеличения ПЗО		Увеличение ПЗО (мм)	
	Кол-во глаз	%	Кол-во глаз	%	Min - max	средняя
12 мес.	216	90	24	10	0,1-0,2	0,15±0,03
24 мес.	208	88	32	12	0,1-0,3	0,23±0,02

The obtained result is achieved due to the systemic effect of BRT on the pathogenesis of myopia progression, including the normalization of the regulation of the accommodation process by the central nervous system and the ANS, the restoration of hormonal regulation by the diencephalic-pituitary system and metabolic processes in the connective tissue.

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