

## Optimization of reflexology technologies for lumbosacral dorsopathies

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### Optimization of reflexology techniques in treatment of lumbosacral dorsopathies

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#### SUMMARY

This article is devoted to the establishment of the effectiveness and therapeutic reliability of modern technologies of reflexology in the treatment of patients with dorsopathies at the lumbosacral level. There were 90 patients under observation at the age from 26 to 52 years; methods of examination of this contingent included clinical, pathopsychological and electrophysiological analysis. The groups of patients were identified: in the first two groups, the drug Target T, indicated for pathology of the musculoskeletal system, was used. In the control group, the drug was used intramuscularly, in the main group - through pharmacopuncture. In the comparison group (placebo), pharmacopuncture with physiological saline was performed.

In the case of pharmacopuncture, the drug established the addition of reflex and drug links in the form of effectiveness and therapeutic reliability, while in response to the use of saline, the instability of the results achieved. The cumulative therapeutic effect of standard drug use has also been demonstrated. In general, this study expands the evidence base for the use of reflexotherapy methods for dorsopathies.

**Key words:** dorsopathies, reflexology, pharmacopuncture, thermography, rheovasography, somato-sensory evoked potentials.

#### RESUME

This article focuses on estimation of the therapeutic efficacy and reliability of modern reflexology technologies in treatment of patients with dorsopathy at lumbosacral level. We observed 90 patients aged 26 to 52 years; methods of examination included clinical, pathopsychological and electrophysiological analysis. Patients were distributed into 3 groups: in the first 2 groups we used Zell T preparation which is indicated for pathology of the musculoskeletal system. In the control group the drug was used intramuscularly, in the main - by pharmacopuncture. In the control group (placebo) saline injections were performed.

In case of pharmacopuncture addition of reflex and drug units in the form of therapeutic effectiveness and reliability was established, whereas in response to the use of saline (placebo) - instable results were achieved. Cumulative therapeutic effect of the standard drug use was also demonstrated. In general, this study expands the evidence base for application of acupuncture methods in treatment of dorsopathies.

**Keywords:** dorsopathies, reflexology, pharmacopuncture, thermography, rheovasography, somatosensory evoked potentials.

#### Introduction

Among the priority issues facing medical rehabilitation, the topic of scientific substantiation and implementation of new effective methods of treatment and rehabilitation of patients is highlighted [6]. The put forward thesis is directly related to the problem of dorsopathies, the medical and social significance of which is determined by the prevalence of the process (at the level of a pandemic), with the maximum indicators of disability of the population [1, 4, etc.]. Dorsopathies, as a rule, are characterized by a protracted course and resistance to most conservative

methods of influence, which causes interest in other methods of correction, including reflexology technology [1, 3].

Among the latter, pharmacopuncture stands out - a method of introducing medications into the area of acupuncture points, thus combining physical and medication principles [1, 3, 4, etc.]. It has been proven that the effects of pharmacopuncture go beyond the simple summation of the reflex and drug links, however, the therapeutic mechanisms of this method are far from fully disclosed. In particular, researchers deliberately avoid the use of imitation of pharmacopuncture in the form of placebo for dorsopathies, explaining this a priori by insufficient effectiveness. The present study is aimed at solving, among others, this problem, in general, expanding the evidence base of reflexology.

#### Materials and methods

The study included 90 patients (41 women and 49 men) aged 26 to 52 years with dorsopathy at the lumbosacral level in the phase of prolonged exacerbation. According to the anamnesis, the previous long-term conservative treatment was not effective enough.

#### Research methods

All patients underwent vertebro-neurological examination [5], with the additional use of pain assessment according to the coordinates of the Visual analogue scale - VAS [7]. At the same time, psychological testing was performed using the questionnaire methods of "multilateral personality research" (MIL) and "well-being-activity-mood" (SAN). Thermographic characteristics of the lumbosacral region and lower extremities were determined using an AGA-782 device from AGEMA (Sweden). Pulse blood circulation in the legs and feet was investigated by means of tetrapolar rheovasography (apparatus "Bioset-6001"), analyzing such indicators as rheographic (RI) and dicrotic (DI) indices, as well as the time of rise of the pulse wave (EP). Somatosensory evoked potentials (SSEP) were recorded using the Neuron-Spect-4 / VPM apparatus from Neurosoft (Russia),

#### Treatment methods

Patients were divided into 3 randomized treatment groups, each of 30 individuals. In all groups, medications, segmental massage and therapeutic physical education were used as the baseline. In addition to this, in the first two groups, we used a complex preparation Zel T ("Heel", Germany), which is directly indicated for pathology of the musculoskeletal system. In the 1st, control group, the drug was prescribed by intramuscular injections, in the 2nd, the main one - through pharmacopuncture, injecting it into the area of reflexotherapy points, mainly the meridian of the bladder [4]. In the 3rd, comparison group, pharmacopuncture was performed with physiological saline, stimulating the same loci as in the main group. This approach, despite the known reflex effect, we regarded as a placebo.

The treatment course, regardless of the technologies used, consisted of 10 procedures performed every other day. When evaluating the effectiveness of treatment methods, the positions of "significant improvement" were singled out - in the form of positive dynamics of both subjective and objective characteristics; "Improvements" - positive changes only on the part of subjective indicators; "No effect" and "deterioration". After six months from the end of therapy, a follow-up analysis was carried out, with the specification of the therapeutic reliability of the results achieved.

The studies were carried out in dynamics, with computer-statistical data processing according to Student's t test.

## results

Clinically, reflex manifestations of lumbar osteochondrosis were established in 47 cases, radicular manifestations - in 43 cases. In addition to the vertebral syndrome, the vascular component of the vertebrogenic process prevailed in two-thirds of the patients. At the same time, the initial average intensity of pain, one of the leading complaints of patients, was  $6.5 \pm 0.32$  points on the VAS scale.

Initially, in the course of psychological examination, 72% of patients revealed changes in the mental sphere, with the predominance of disorders of the astheno-neurotic register. The peculiarities of these violations were reflected in the averaged profile of the MIL test: the rise in the 1st (significant,  $p < 0.05$ ) and, to a lesser extent, the VI-VIII scales. Characteristic was a distinct (also significant,  $p < 0.05$ ) decrease in SAN indices, first of all - "activity".

As a result of thermography, 62% of patients showed a decrease in local temperature in the lower extremities, mainly from the "affected" side. The noted increase in displacements in the distal direction - up to  $\Delta t 1.4 \pm 0.04$  degrees Celsius ( $p < 0.05$ ) indirectly testified in favor of the spastic nature of vascular reactions. These data were in good agreement with the results of rheovasography in the form of a decrease in the pulse blood filling of the legs and feet ( $p < 0.05$  relative to the control) against the background of the spastic state of the arteries of the middle and small register. During the analysis of SSEPs in patients with radiculopathies, a difference ( $p < 0.05$ ) was noted in the quantitative characteristics of "healthy" and "affected" limbs - lengthening and asymmetry of the latent periods of the estimated peaks within 2.2-3.2 ms.

At the end of treatment, the pharmacopuncture groups (i.e., the main and comparison groups) showed positive, generally comparable results. So, "significant improvement" and "improvement" was noted here in 70% and 66.6% of patients, respectively, versus 53.3% in the control group (Table 1). It should be noted that the deterioration observed in one case in the first two groups is difficult to associate with the ongoing therapy - they, most likely, were associated with the peculiarities of the course of the vertebrogenic process.

Table 1

Comparable treatment success (in%)

Группы больных	Состояние							
	Значительное улучшение		Улучшение		Без эффекта		Ухудшение	
	Абс.	%	Абс.	%	Абс.	%	Абс.	%
1-я	5	16,6	11	36,7	13	43,4	1	3,3
2-я	10	33,3	11	36,7	8	26,7	1	3,3
3-я	10	33,3	10	33,3	10	33,4	-	-

The average time to achieve a positive stable effect in both groups of pharmacopuncture, with a slight scatter of numbers, was 4.5 procedures in patients with reflex and 6.4 in patients with radicular syndromes, significantly ( $p < 0.05$ ) exceeding the indicators of the control group - 7.5 and 9.1 procedures, respectively. At the same time, the dynamics of the severity of pain, one of the significant manifestations of dorsopathy, corresponded to the emerging trend: in the pharmacopuncture groups, the VAS index decreased on average by 65%, while in the control group - by 37%.

Changes in the mental status of patients primarily depended on the level of the achieved therapeutic effect. Parallel to the regression of neurological manifestations in the main and comparison group, 59% of patients noted a decrease in affective tension and fatigue, and in the control group - only 38%. The averaged analysis of the MIL test of patients with improved condition reflected a significant ( $p < 0.05$ ) drop in the initial peak on the 1st scale and a relatively favorable position of the positions on the right side of the graph; in parallel, there was an increase in the average indicators of SAN, mainly - "mood".

The trend towards normalization of thermogram indices in the pharmacopuncture groups was noted in 82% of cases, with a significant ( $p < 0.05$ ) decrease in the thermoasymmetry of the lower leg zones, while in the control group - in 43%. The actual quantitative characteristics of thermograms

are presented in table. 2.

table 2

Группы больных	Выраженность асимметрии ( $\Delta t^{\circ}\text{C}$ )	
	Исходно	После лечения
1-я	$1,27 \pm 0,08$	$1,2 \pm 0,1$
2-я	$1,28 \pm 0,1$	$0,63 \pm 0,09^*$
3-я	$1,25 \pm 0,12$	$0,75 \pm 0,15$

Примечание: \* – достоверность ( $p < 0,05$ ) изменений.

In response to pharmacopuncture, both means showed an improvement in rheographic and characteristics (RI - significant,  $p < 0.05$ ) of the legs and feet, while in the case of intramuscular injections, the persistence of "vascular" complaints was associated with minor changes in rheograms (Table 3).

According to the results of the SSEP analysis, in the pharmacopuncture groups there was a significant ( $p < 0.05$ ) reduction in the latent periods of the peaks - P19, on average, in 80% of patients, N21 - 76%, P40 - 63%, with a significant decrease in their asymmetry - by two and more times. On the contrary, in the control group, the decrease in the latent periods of the peaks, as well as the asymmetry itself, was insignificant.

Table 3

Dynamics of rheovasogram indices of the legs in groups of patients ( $M \pm m$ )

Группы больных	Показатели					
	РИ (Ом)		ДИ		ВП (с)	
	До	После	До	После	До	После
1-я	$0,046 \pm 0,005$	$0,048 \pm 0,006$	$0,35 \pm 0,05$	$0,36 \pm 0,05$	$0,12 \pm 0,004$	$0,12 \pm 0,007$
2-я	$0,047 \pm 0,006$	$0,063 \pm 0,006^*$	$0,33 \pm 0,05$	$0,36 \pm 0,07$	$0,12 \pm 0,005$	$0,11 \pm 0,009$
3-я	$0,045 \pm 0,007$	$0,061 \pm 0,005^*$	$0,34 \pm 0,06$	$0,37 \pm 0,08$	$0,13 \pm 0,008$	$0,12 \pm 0,008$
Контроль	$0,07 \pm 0,01$		$0,39 \pm 0,06$		$0,09 \pm 0,007$	

Примечание: \* – достоверность ( $p < 0,05$ ) изменений.

Thus, immediately after the completion of the treatment, the therapeutic advantage of pharmacopuncture with both agents was established over the standard, intramuscular use of the drug Objective T, which is explained by the analgesic and vasoregulatory effect inherent in the studied technology. In addition, according to the results of this stage of the study, a conclusion is made about the primary positive effect of the reflex component, and not the medication itself.

However, during the follow-up analysis, the opposite picture was noted in the form of shifts in the ratio of the results achieved. If in the comparison group (pharmacopuncture with physiological saline) relapses of dorsopathy were found in 32% of those observed, then in the first two groups exacerbations were noted in a comparatively smaller number of observations - 20% ( $p < 0.05$ ), and in the main group they proceeded in a softer "Form. At the same time, the clinical characteristics were verified by the data of an objective study.

#### Discussion and conclusions

As a result of the study, it was confirmed that the rate of formation of positive reactions, as well as their stability, directly depends on the applied complex technologies of reflexology. In particular, the addition of reflex and drug effects in the course of pharmacopuncture with the drug Target T was revealed, and, on the other hand, the instability of the results in response to the use of saline. In addition, the data obtained indicate a delayed cumulative therapeutic effect and standard, intramuscular use of the studied drug, which is confirmed by a small number of exacerbations in the long-term period. Also, a particular problem was solved about the possibility of using placebo in studies on reflexology and traditional medicine in general.

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Agasarov, L.G. Optimization of reflexology technologies for lumbosacral dorsopathies / L.G. Agasarov, I.V. Kuzmina // Traditional Medicine. - 2015. - No. 1 (40). - S.31-34.

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