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**OPTIMIZATION OF REHABILITATION MEASURES FOR LUMBAR SPONDYLOGENIC RADICULOPATHIES**

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*Abstract: Lumbar radiculopathy, manifested by back pain due to various lesions of the lumbosacral spine, is one of the most common pathological conditions found not only in outpatient neurology, but also in general medical practice. That is why back pain is currently considered as an interdisciplinary problem. The complexity of pathogenesis, the great socio-economic importance, the need for special training of doctors led to its separation into a separate direction of neurology, neurosurgery and traumatology o'2,4,9g'.*

*Keywords: socio-economic importance, neurology, neurosurgery and traumatology.*

The relevance of studying the problem is determined by the significant proportion of lumbar radiculopathies in the structure of morbidity. Almost every second person during his life has symptoms indicating the presence of spondylogenic radicular pathology. And the specific weight of neurological manifestations of osteochondrosis of the spine, according to various authors, ranges from 67 to 95% of all diseases of the peripheral nervous system [1,5,7].

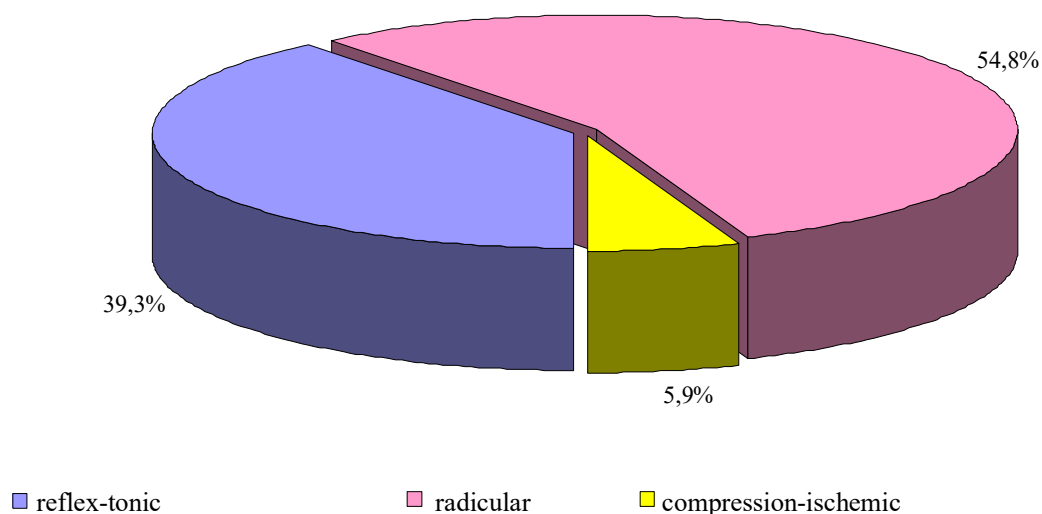
According to the analysis of the literature of recent years and scientific research devoted to the neurological manifestations of lumbar osteochondrosis, it is worth noting a considerable amount. Despite this, vertebrogenic dorsalgias and dorsopathies remain an urgent problem of modern neurology. Of particular importance is the problem of conducting an effective inpatient stage of treatment, which is used in most medical institutions, but, unfortunately, does not take into account the subsequent complex of rehabilitation measures. At the same time, despite the wide discussion of the problem, there is no consensus in the literature sources and there is no program for conducting phased inpatient and subsequent outpatient rehabilitation measures, including the achievements of modern methods of medical rehabilitation [3,6,8].

The purpose of the study: to develop comprehensive rehabilitation programs for patients with lumbar spondylogenic radiculopathies.

Material and methods of research. The studies were performed in 2014-2022 on the basis of the neurological department of the Samarkand City Medical Association. 168 patients receiving inpatient treatment were examined. Subsequently, 84 patients who made up the main group continued the rehabilitation course at the Samarkand Rehabilitation Center. At the third stage, all the studied patients were on outpatient treatment and observation. The age of the patients ranged from 16 to 60 years, of which

94 (55.95%) were women and 74 (44.05%) men.

At the inpatient stage, all patients underwent clinical and neurological examinations, among which 66 (39.3%) patients with reflex-tonic syndromes, 92 (54.8%) with radicular syndromes and 10 (5.9%) with compression-ischemic syndromes were identified (Fig.1).



**Rice. 1. Leading clinical and neurological syndromes in patients**

All patients who were on inpatient treatment, depending on the observance of the stages of rehabilitation and taking into account the intensity of pain syndromes, were divided into two groups of equal sex and age: the main group consisted of 84 (50.0%) patients (of which 51 patients had a pronounced pain syndrome and 33 patients had moderate pain syndrome). The second group (comparison) also included 84 (50.0%) patients (51 patients with severe pain and 33 with moderate pain).

The first (main) group of patients received staged treatment: hospital - rehabilitation center - outpatient stages. And 84 patients, which make up the 2nd group, were limited to treatment in a hospital and in an outpatient setting (table 1).

**Table 1**  
**Distribution of patients by stages of therapeutic measures**

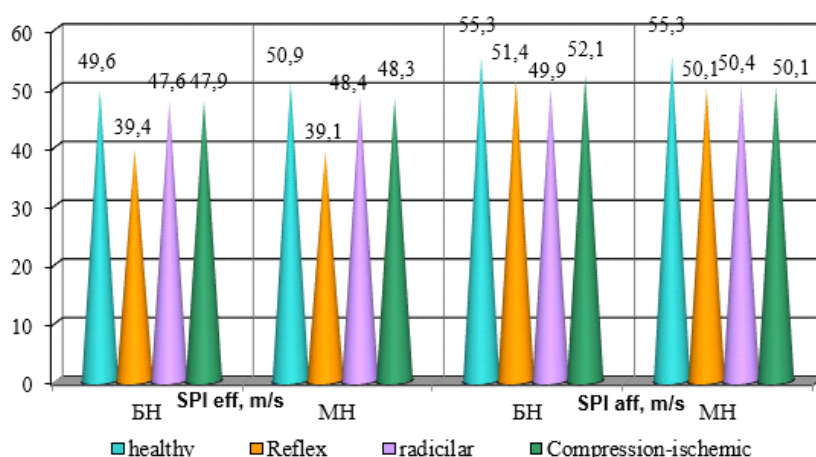
Place of treatment	1 group		2 group		Total	
	abs.	%	abs.	%	abs.	%
Samarkand city medical association	84	50	84	50	168	100
Rehabilitation Center	84	50	-	-	84	50
Polyclinic	84	50	84	50	168	100

When collecting an anamnesis, special attention was paid to the factors influencing the origin and course of the disease. The intensity of the pain syndrome after a general examination of patients was assessed using a 10-point visual analogue scale (VAS). All patients completed the Roland-Morris (1983) questionnaire on "Lower back pain and disability" from the first day of hospitalization. In 1994, R.S. Startford and J.M. Binkley developed a form of a questionnaire consisting of 18 items. According to the terms of the questionnaire, patients assessed their condition by marking the item that they considered correct. If patients respond to 7 or more items, the quality of life of these patients is

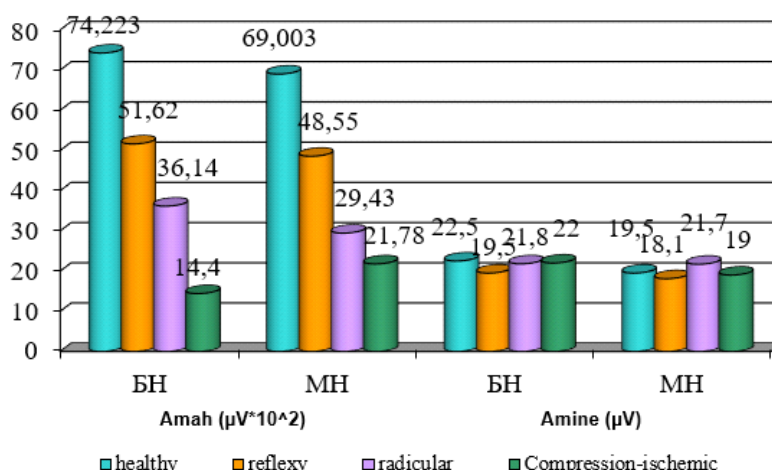
considered impaired. The test is very sensitive for assessing acute and subacute pain. The questionnaire was filled out by patients on the first day in a hospital or rehabilitation center, then every 2-4 weeks a second survey of patients was conducted. If the patient at the first test indicated 12 points, and after 2 weeks only 2 points, then his condition improved by 10 points or 83%, i.e.  $(10/12 \times 100 = 83)$ .

To determine the effectiveness of measures, study the state of the spinal column and observe the dynamics of nerve conduction for the purpose of monitoring, a set of measures was carried out using functional methods such as radiography, computed tomography (CT), magnetic resonance imaging (MRI), electroneuromyography (ENMG).

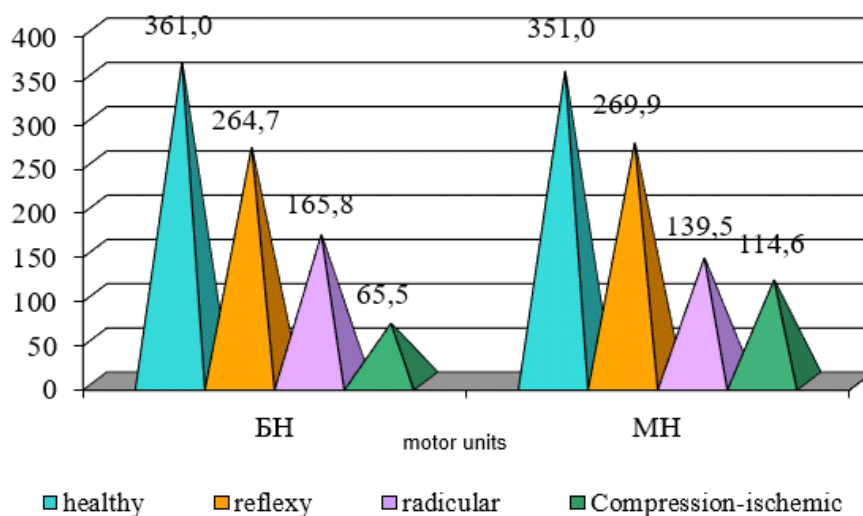
Research results and discussion. According to the ENMG performed in patients with reflex syndromes, there was a decrease in the conduction of motor impulses. In radicular syndrome, there was a maximum 2-fold decrease in the M-response relative to other groups, and relative decrease in the motor unit. With compression syndrome, a 3-fold decrease in the maximum M-response and a significant decrease in the motor unit were revealed (Fig. 2, 3, 4).



Rice. 2. Indicators of the velocity of motor and sensory impulses before treatment



Rice. 3. Data on the amplitude of the maximum and minimum M-response of ENMG in patients before treatment



Rice. 4. ENMG motor unit data in patients before treatment¶

All 168 patients received traditional therapeutic measures in the form of medical treatment, including non-steroidal anti-inflammatory drugs, anticholinesterase agents, B vitamins, biostimulants, drugs that improve blood circulation, as well as physiotherapy procedures (diadynamic currents, ultraphonophoresis with 4% mumiyo, massage).

The patients of the main group (Group 1), along with the traditional treatment, were prescribed a muscle relaxant intramuscularly for 5 days, then tablets 3 times a day for 10 days), in addition, to reduce the pain syndrome, additional NSAIDs were prescribed in the form of paravertebral blockade and acupuncture (IRT). When using acupuncture, combined treatment is widely used: corporal acupuncture and auriculotherapy using the meridians of the kidneys, liver, spleen, pancreas.

IRT for pain relief was performed at the local segmental points: V 25 Yes - chan-shu, V 26 - Guan-yuan-shu, V 40 - Wei-zhong, V 60 - Kun-lun, T 1 - Chang-qiang, T 3 - Yao-yang-guan, T 4 - Ming-men, TVM 76 - Zhong- kun, TVM 139 - Quan-sheng-ju.

When diagnosing a patient with depression and asthenia, the points of Feng-chi ( VB 20 ) , San-yin-jiao (RP 6) were used symmetrically; Bai-hui (T 20), Gan-shu (V 18), Shen-shu (V 23), Xe-gu (GI 4) symmetrically, Da-zhui (T 14) by the exciting method.

Auriculotherapy was carried out at the points AT 52 - sciatic nerve, AT 40 - lumbar spine.

For a one-stage procedure, common points were used in an amount from 5 to 10. For each patient, an individual prescription for points was developed and acupuncture was performed for 10 minutes. When the excitation syndrome prevailed, a sedative method of auriculotherapy was used to relieve severe pain. In this case, the exposure time is somewhat lengthened. The treatment course also ranged from 5 to 10 procedures (until a good clinical result).

To excite the vertebral muscles and biologically active points, a complex vacuum massage was used. In our opinion, during vacuum massage, local blood circulation improves, the autonomic nervous system is activated, and muscle tone decreases.

According to the results of our studies, after the inpatient stage, pain decreased in 58 (69%) patients from the main group, and paresthesias disappeared in 4 patients. Tension symptoms improved in 74 (85.7%) patients.

In the comparison group, pain decreased in 49 (58%) patients, paresthesia in 3

patients, and tension symptoms decreased in 65 (77.4%) patients. Disturbance of sensitivity of the radicular type decreased in 27 (58.7%) patients, in 16 (59.2%) patients the tone of the tibial, femoral and gluteal muscles increased.

The study of the next rehabilitation stage included patients of the main group.

The treatment was carried out in the Samarkand Regional Socio-Medical Rehabilitation Center for the Disabled. In the treatment, a set of measures was used, including therapeutic physical exercises and PIR (post-isometric muscle relaxation).

In order to draw up rehabilitation programs, a study was made of the effectiveness of physical rehabilitation methods and their impact on the musculoskeletal system, and on the entire body, as well as objective criteria for post-isometric muscle relaxation at the stages of rehabilitation.

In the complex treatment, we used exercises according to the method of Professor V.V. Povoroznyuk, which harden, give strength and strengthen the muscle-articular segments. At the rehabilitation stage, non-intense exercises were prescribed in combination with PIR. The effect of a course of therapeutic gymnastics and the implementation of special PIR complexes for the correction of muscle imbalance were considered.

The essence of the technique lies in the combination of short-term (5-10 with . ) isometric work with minimal intensity and passive stretching of the muscle in the next 5-10 s. The repetition of such combinations is carried out 3-6 times. As a result, persistent hypotension occurs in the muscle and the initial soreness disappears.

The mechanism of therapeutic action of PIR is complex. Relaxation is based on a complex of factors, the most important of which is the normalization of the activity of the reflex apparatus of the spinal cord, the restoration of a normal dynamic stereotype. It should be emphasized that PIR is a completely safe manual therapy technique. It can be used as an alternative to joint manipulation. PIR is the basis of the so-called soft technique. The relaxing effect of PIR is practically not realized on clinically healthy muscles, which eliminates the side effects of the technique.

PIR consists in a two-phase effect on the muscle. First, we perform a preliminary stretching of the muscle to the elastic barrier with a small effort, then the patient himself conducts active work on volitional muscle contraction for 6-10 seconds. At the same time, we feel the "inclusion" of the muscle in the work, without making significant efforts to counteract. Thus, the muscle performs minimal isometric work - tension without shortening. The isometric contraction phase lasts about 6-10 s. Then we ask the patient to relax, after which we perform additional stretching of the muscle with minimal effort and fix it in a new position. Passive stretching of the muscle is also performed for 6-10 s.

It should be noted that no exacerbation of the pathological process was observed during the treatment. 96% of patients had a positive effect. Only at the first session in 34% of patients, and after 3-4 sessions in 90% of patients the pain decreased.

At the end of treatment procedures, 88% of patients showed an increase in the range of motion in the spinal column and a decrease in muscle tension. And also the indications of pain on the scale of the Visual analogue scale decreased by 3 points.

At the end of the treatment course, the general condition of the patients improved in the form of a decrease in general weakness and an improvement in mood.

After the stage of rehabilitation procedures, to characterize the effect of treatment, an ENMG study was performed. At the same time, the speed of conduction of motor impulses clearly increased in reflex syndrome, and the index of the motor unit and the amplitude of the maximum M-response increased markedly in radicular and compression-ischemic syndromes.

According to the Rolland-Morris questionnaire, before treatment, patients noted 12



points, after analyzing the rehabilitation measures, 3 patients noted 2 points, and 2 patients noted 1 point, and the rest of the patients did not mark a single point.

At the rehabilitation stage, 96% of patients in the 1st group showed a general improvement. The results of the research showed that the developed complex measures for physical rehabilitation show high efficiency in relation to patients with osteochondrosis of the spinal column who took special restorative methods.

Patients of both groups participated in the outpatient stage of treatment. They were under observation in polyclinics and rural medical centers at the place of residence. At this stage, physiotherapeutic treatment was used in patients of both groups (electrophoresis with 4% mumiyo and Chondroxide ointment). Along with this, patients of the main group took muscle relaxants 1 tab. 3 times a day for up to 10 days, as well as non-steroidal anti-inflammatory drugs (NSAIDs) 1 tab. 2 times a day up to 10 days. In addition, the patients independently continued the exercises of the PIR method and therapeutic physical exercises. And patients from the comparison group underwent NSAID monotherapy - 1 tab. 2 times a day for 10 days.

According to the results of ENMG after the stage of complex rehabilitation, the indicators in patients from the main group were much closer to the normative ones. In the comparison group, despite clinically positive results in 71 (84.5%) patients who experienced statistical changes, only patients with compression-ischemic syndrome were diagnosed with minor changes in the M-response (Table 2).

**Table 2.**

**Parameters of the ENMG study in the observation groups after the outpatient-polyclinic stage of treatment**

Indicators		Reflex syndrome		radicular syndrome		Compression-ischemic syndrome	
		Main group	Comparison group	Main group	Comparison group	Main group	Comparison group
SPI eff (m-s)	tibial nerve	48.9±1.0 <sup>^^^</sup>	42.3±1.00 <sup>^</sup>	48.5±0.99	47.8±1.07	48.4±1.8	48.0±3.2
	peroneal nerve	49.9±1.11	42.8±0.96 <sup>^</sup>	50.1±1.02	49.4±1.03	48.9±2.3	48.4±2.0
SPI aff (m-s)	tibial nerve	55.0±1.24 <sup>^</sup>	52.9±1.18	53.1±1.09 <sup>^</sup>	49.9±1.01	52.7±2.5	51.7±2.4
	peroneal nerve	55.1±1.22 <sup>^^</sup>	51.4±1.21	53.9±1.1 <sup>^</sup>	51.7±1.07	54.4±2.6	52.1±2.2
A max (μV)	tibial nerve	7241±1.54 <sup>^^^</sup>	5979±133.5 <sup>^^^</sup>	4840±95.8 <sup>^^^</sup>	3815±76.0	2770±107.5 <sup>^^^</sup>	1940±77.9 <sup>^^</sup>
	peroneal nerve	6815±150.2 <sup>^^^</sup>	5734±129.3 <sup>^^^</sup>	4499±89.0 <sup>^^^</sup>	3089±65.8	3110±111.9 <sup>^^^</sup>	2594±100.9 <sup>^</sup>
A min (μV)	tibial nerve	21.1±0.47 <sup>^</sup>	20.7±0.49	22.1±0.45	21.2±0.41	22.1±0.68	22.1±0.96
	peroneal nerve	19.4±0.43 <sup>^</sup>	19.0±0.43	20.1±0.41	20.4±0.45	19.1±0.89	19.1±0.77
DE	tibial nerve	327.2±7.3 <sup>^^^</sup>	290.1±6.6 <sup>^</sup>	219.1±4.4 <sup>^^^</sup>	180.1±4.2 <sup>^</sup>	123.4±3.2 <sup>^^^</sup>	81.1±3.5 <sup>^^</sup>
	peroneal nerve	349.9±7.8 <sup>^^^</sup>	301.8±6.8 <sup>^^</sup>	223.5±4.6 <sup>^^^</sup>	151.9±3.5 <sup>^</sup>	162.1±6.5 <sup>^^^</sup>	128.2±4.0 <sup>^</sup>

Note: <sup>^</sup>-significant compared with the data of the group before treatment (<sup>^</sup>-P<0.05, <sup>^^</sup>-P<0.01, <sup>^^^</sup>-P<0.001).



In patients of the main group according to VAS, mild pain was observed only in 4 patients after the complex rehabilitation. In all patients, the tension of the rectus dorsi muscles disappeared. The positive symptom of tension remained in a weak negative form only in 3 patients.

In patients of the comparison group according to the VAS scale, severe pain remained in 3 patients, moderate pain in 4 patients, and mild pain remained in 14 patients. Tension of the rectus dorsi muscle remained in 7 patients, the tension symptom was sharply positive in 3 patients, moderately positive in 7 patients, and weakly positive in 12 patients.

As a result, at the outpatient stage, the overall efficiency in patients of the main group was 97%, in the comparison group - 85.5%.

### **Conclusions**

1. In the manifestation of the clinical picture in patients with lumbar spondylogenic radiculopathies, subjective manifestations (pain, hyperesthesia) dominate. The severity of acute pain syndrome according to VAS can be regarded as severe or moderate.

2. In the dynamics of ENMG indicators, the restoration of reduced neuromuscular transmission is revealed, as well as the restoration of the conduction of excitation in the peripheral nervous system. A timely course of inpatient treatment and subsequent comprehensive rehabilitation can reduce the intensity of pain in many patients with lumbar vertebrogenic syndromes.

3. Carrying out adequate methods of early rehabilitation treatment improves the condition of patients and accelerates the regression of lumbar spondylogenic neurological syndromes, as well as improves the prognosis for the restoration of lost functions and improves the quality of life of patients.

4. Carrying out a complex of rehabilitation programs for patients with lumbar vertebrogenic syndromes, including algorithms for inpatient, rehabilitation and outpatient treatment stages, can reduce the time of temporary disability and disability of patients.

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