



Article

Therapy with Muscle Relaxants for Radiculopathies Associated with Spinal Pathology

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Abstract: The article examines the efficacy of centrally acting muscle relaxants (tolperisone, tizanidine, baclofen) in the complex treatment of vertebrogenic radiculopathies. Was to evaluate the impact of muscle relaxants on reducing muscle tone, alleviating pain syndrome, and improving the effectiveness of nerve root decompression. Two groups of patients with MRI-confirmed radiculopathy were examined: the primary group received muscle relaxants in combination with standard therapy, while the control group received standard therapy alone. Assessment was based on the Visual Analog Scale (VAS) and neurological deficit dynamics. It was found that incorporating muscle relaxants into the treatment regimen for 7–14 days facilitates faster regression of muscle-tonic syndrome and restoration of the range of motion. The use of muscle relaxants is pathogenetically justified and significantly increases the effectiveness of complex treatment, especially in cases of severe pain syndrome.

Keywords: Vertebrogenic radiculopathy, Centrally acting muscle relaxants, Dorsalgia.

Introduction

Vertebrogenic radiculopathies represent one of the most frequent reasons for patients seeking medical assistance in both neurological and general clinical practice. According to various studies, a significant portion of the adult population experiences manifestations of dorsalgia and radicular syndromes during their lifetime, which accounts for the high medico-social significance of this pathology[1,2,3].

The underlying cause of the disease involves degenerative-dystrophic changes of the spine, including osteochondrosis, as well as protrusions and herniations of intervertebral discs, which lead to nerve root compression. In response to pain impulses, a reflex muscle spasm is formed. While initially performing a protective function, it subsequently becomes an independent pathogenetic factor that exacerbates the pain syndrome and restricts spinal mobility [4,5,6,7].

The musculo-tonic syndrome contributes to the formation of a "vicious cycle": pain triggers a spasm, which in turn intensifies the pain and the compression of neural structures. This leads to the chronicity of the process, reduction in patients' work capacity, and deterioration in the quality of life. Consequently, eliminating the muscular component of pain is one of the key objectives of therapy [8,9,10].

Modern approaches to the treatment of vertebrogenic radiculopathies involve a comprehensive impact on various links of pathogenesis. Along with non-steroidal anti-

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inflammatory drugs (NSAIDs), B-group vitamins, and physiotherapeutic methods, centrally acting muscle relaxants occupy an important place. Their application is aimed at reducing pathological muscle tone, decreasing pressure on nerve roots, and enhancing the effect of analgesic therapy [11,12,13].

Despite the widespread use of muscle relaxants in clinical practice, issues regarding the optimal drug selection, duration of therapy, and assessment of their efficacy as part of complex treatment remain highly relevant. This determines the necessity for further study of their role and the justification for their use in vertebrogenic radiculopathies [14,15].

Aim of the Study

To conduct a comprehensive assessment of the efficacy of muscle relaxants in the treatment of vertebrogenic radiculopathies. The study examines their impact on reducing muscle tone, decreasing nerve root compression, and alleviating pain intensity, as well as the restoration of mobility and the functional status of patients. Additionally, the study analyzes their role within complex therapy and provides a comparative evaluation of treatment outcomes both with and without the use of muscle relaxants.

Materials and Methods

Study Design This study was conducted as a prospective comparative trial at a clinical facility. The study included 60 patients diagnosed with vertebrogenic radiculopathy. The diagnosis was established based on clinical neurological examinations and confirmed by Magnetic Resonance Imaging (MRI) data.

Patient Characteristics The cohort consisted of 34 women (56.7%) and 26 men (43.3%) aged 25 to 65 years (mean age 44.2 ± 10.3 years). The duration of the disease ranged from 2 weeks to 6 months.

Inclusion and Exclusion Criteria

Inclusion criteria: Presence of clinically manifest radicular syndrome (pain, paresthesia, sensory loss, muscle weakness), confirmed by instrumental diagnostic methods.

Exclusion criteria: Severe somatic or oncological diseases, acute infectious processes, pregnancy, as well as contraindications or individual intolerance to the studied medications.

Study Groups Patients were divided into two groups, comparable in their primary clinical and demographic characteristics:

Study Group (n = 30): Received standard therapy supplemented with centrally acting muscle relaxants (tolperisone, tizanidine, or baclofen).

Control Group (n = 30): Received standard therapy without the use of muscle relaxants.

Treatment Protocol Standard therapy included non-steroidal anti-inflammatory drugs (NSAIDs), B-group vitamins, physiotherapy, and therapeutic exercise. Muscle relaxants were prescribed in therapeutic dosages for a course of 7–14 days, depending on the clinical severity of the symptoms.

Efficacy Assessment Treatment efficacy was evaluated dynamically: before the start of therapy and upon completion of the course. The following methods were used to objectify the results:

Visual Analog Scale (VAS) for pain intensity;

Clinical assessment of muscle tone;

Neurological examination to determine the degree of radicular deficit;

Assessment of the range of motion (ROM) in the affected spinal segment.

Statistical Analysis Statistical data processing was performed using variational statistics methods. Quantitative indicators are presented as mean and standard deviation

(M ± SD). The significance of differences between groups was assessed using parametric and non-parametric tests. Differences were considered statistically significant at a significance level of $p < 0.05$.

Results and Discussion

In the course of the study, all patients exhibited a pronounced pain syndrome prior to therapy, accompanied by musculo-tonic disorders and restricted mobility in the affected spinal segment.

According to the Visual Analog Scale (VAS), the baseline pain level was 7.6 ± 1.2 points in the study group and 7.4 ± 1.3 points in the control group, indicating no statistically significant differences between the groups at the initial stage ($p > 0.05$).

Following the course of therapy, positive dynamics were observed in both groups; however, the changes were more pronounced in the study group receiving muscle relaxants. Specifically, the VAS pain level decreased to 2.9 ± 1.1 points, whereas in the control group, it decreased to 4.5 ± 1.2 points ($p < 0.05$).

A reduction in the severity of musculo-tonic syndrome was observed in 86.7% of patients in the study group, compared to 60.0% in the control group. Patients receiving muscle relaxants demonstrated a more rapid elimination of muscle spasm and a decrease in tenderness during palpation of the paravertebral muscles.

Analysis of the neurological status showed that regression of radicular symptoms (reduction of paresthesia, restoration of sensitivity, and increase in muscle strength) was observed in 73.3% of patients in the study group and 53.3% of patients in the control group.

Furthermore, a more significant restoration of the range of motion (ROM) in the spine was noted in the study group. Improvement in motor activity was recorded in 80.0% of patients, whereas in the control group, this figure was 56.7% (Table 1).

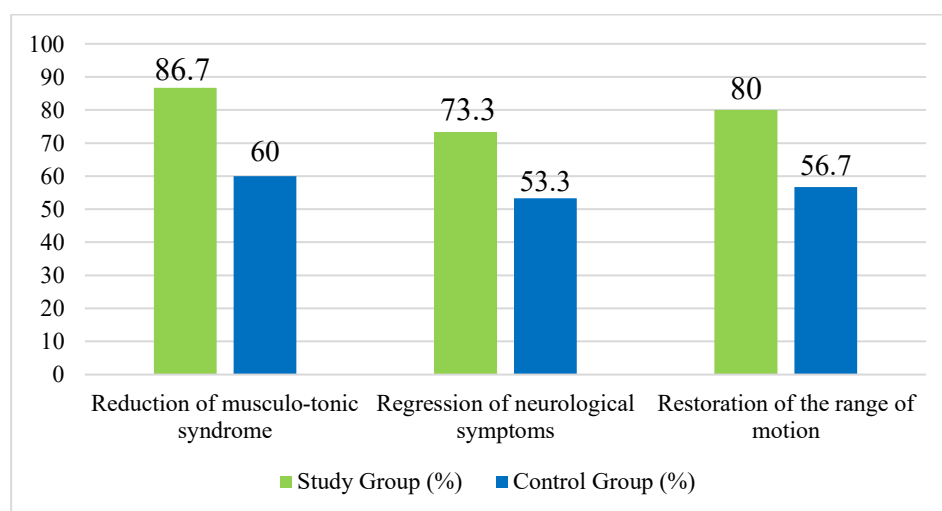


Table 1. Comparative Evaluation of Clinical Treatment Outcomes in Patients with Vertebrogenic Radiculopathies (%).

The obtained results confirm that the inclusion of muscle relaxants in комплекс therapy contributes to a more effective interruption of the pathogenetic “vicious circle” of pain and muscle spasm. A reduction in muscle tone leads to decreased pressure on nerve roots, which, in turn, promotes a faster regression of pain syndrome and neurological manifestations.

The greatest effectiveness of these drugs is observed with their short-term use in the acute and subacute periods of the disease as part of комплекс treatment, including nonsteroidal anti-inflammatory drugs, B vitamins, and non-pharmacological methods.

Additionally, it was found that the early inclusion of muscle relaxants in therapy contributes to a more rapid achievement of clinical effect, reduction in recovery time, and a decreased risk of chronic pain development. This is of significant importance for the prevention of persistent functional impairments and for improving patients' quality of life.

It was also noted that the combined use of muscle relaxants with physiotherapeutic methods and therapeutic exercise enhances the therapeutic effect due to more complete restoration of muscle balance and normalization of spinal biomechanics.

Importantly, the use of muscle relaxants reduced the need for analgesic drugs and improved overall treatment tolerability. Adverse effects were mild (drowsiness, moderate weakness) and did not require discontinuation of therapy.

Thus, the obtained data indicate the high clinical effectiveness of muscle relaxants in vertebrogenic radiculopathies, especially in the acute and subacute stages of the disease. Their use as part of комплекс therapy ensures faster pain relief, reduction of muscle-tonic disorders, accelerated regression of neurological symptoms, and improvement of patients' functional status.

Conclusions

The conducted study demonstrated that the inclusion of centrally acting muscle relaxants in the комплекс therapy of vertebrogenic radiculopathies significantly increases treatment effectiveness. Their use contributes to a more pronounced reduction in pain syndrome, a decrease in muscle-tonic manifestations, and an accelerated regression of neurological symptoms compared to standard therapy without their use.

It was established that muscle relaxants help break the pathogenetic "vicious circle" of pain — muscle spasm — increased pain, which leads to reduced compression of nerve roots and improvement in patients' functional status. During therapy, a faster restoration of range of motion and increased motor activity were observed.

The highest effectiveness of these drugs is noted with their short-term use in the acute and subacute periods of the disease as part of комплекс therapy, including nonsteroidal anti-inflammatory drugs, B vitamins, and non-pharmacological treatment methods.

Thus, the use of muscle relaxants is pathogenetically justified, clinically effective, and a reasonable approach in the treatment of vertebrogenic radiculopathies, allowing for reduced treatment duration, decreased severity of symptoms, and improved quality of life for patients.

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