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CLINICAL AND NEUROLOGICAL FEATURES OF POLYNEUROPATHY OF CORONAVIRUS AND DIABETIC ETIOLOGY

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Relevance. Polyneuropathies of various etiologies represent one of the pressing problems of modern clinical neurology. In the post-COVID period, lesions of the peripheral nervous system are being increasingly reported, the clinical manifestations of which require differential diagnosis with diabetic polyneuropathy.

Objective. To perform a comparative assessment of the clinical and neurological manifestations of polyneuropathy of coronavirus and diabetic etiology.

Materials and Methods. A total of 95 patients with polyneuropathy were examined: 57 with coronavirus-associated polyneuropathy and 38 with diabetic polyneuropathy. The control group consisted of 30 practically healthy individuals. Assessment included clinical and neurological examination, the Total Symptoms Score, the Visual Analogue Scale for pain, and the Spielberger–Hanin Anxiety Scale.

Results. Patients with coronavirus-associated polyneuropathy demonstrated a higher intensity of pain syndrome and more pronounced anxiety-affective disorders. Sensory disturbances showed comparable prevalence in both groups but differed in structure and stability. Motor impairments were more pronounced in patients with diabetic polyneuropathy.

Conclusions. Polyneuropathies of coronavirus and diabetic etiology have similar clinical manifestations; however, they differ in pain severity, the characteristics of sensory and motor disturbances, and the influence of psycho-emotional factors. These differences should be taken into account in diagnosis and in the selection of treatment and rehabilitation strategies.

Keywords: polyneuropathy, coronavirus infection, diabetic polyneuropathy, pain syndrome, anxiety.

Introduction

Coronavirus disease COVID-19, initially considered primarily a respiratory illness, has demonstrated a pronounced systemic nature during the pandemic, affecting various organs and systems, including the peripheral nervous system. In the post-COVID period, a significant proportion of patients develop persistent neurological complications, among which polyneuropathy occupies a prominent place, accompanied by sensory, motor, and autonomic disturbances.

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Polyneuropathies of various etiologies represent a pressing issue in clinical neurology due to their chronic course, impact on patients' quality of life, and the need for long-term rehabilitation. The most common form is diabetic polyneuropathy, whose pathogenesis is associated with metabolic disorders, microangiopathy, and chronic ischemia of peripheral nerves. In contrast, coronavirus-associated polyneuropathy develops against the background of neuroinflammatory, immune-mediated, and vascular mechanisms, which determine the peculiarities of its clinical course and symptomatology.

Despite the apparent similarity of certain clinical manifestations, coronavirus- and diabetic-associated polyneuropathies may differ substantially in symptom structure, severity of pain syndrome, characteristics of sensory and motor impairments, and the influence of psycho-emotional factors. Comparative study of the clinical and neurological features of these forms of polyneuropathy is of considerable importance for refining diagnostic criteria and developing differentiated approaches to patient management.

Objective

To perform a comparative assessment of the clinical and neurological manifestations of coronavirus- and diabetic-associated polyneuropathy, including analysis of pain syndrome, sensory and motor impairments, as well as anxiety-affective disorders.

Materials and Methods

A total of 95 patients with clinically confirmed polyneuropathy, hospitalized in neurology departments between 2020 and 2023, were examined. Patients were divided into two groups based on disease etiology:

- **Group I** — 57 patients with polyneuropathy developing after coronavirus infection;
- **Group II** — 38 patients with diabetic polyneuropathy.

The control group included 30 practically healthy individuals without clinical signs of peripheral nervous system involvement.

The age of the participants ranged from 35 to 65 years. Groups were comparable in terms of age and sex.

All patients underwent a comprehensive clinical and neurological examination, including analysis of complaints and medical history, assessment of superficial and deep sensitivity (pain, temperature, tactile, and vibratory), evaluation of muscle strength using a five-point scale, and assessment of tendon reflexes.

For quantitative assessment of symptom severity, the Total Symptoms Score (TSS) and Visual Analogue Scale (VAS) for pain were used. Psycho-emotional status was assessed using the Spielberger–Hanin Anxiety Scale (state and trait anxiety).

Statistical analysis was performed using methods of variance statistics. Differences were considered statistically significant at $p < 0.05$.

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Results

Clinical Characteristics

In both groups, the main complaints were numbness, paresthesia, and pain in the distal regions of the lower limbs. However, the structure and severity of symptoms showed notable differences.

Patients with coronavirus-associated polyneuropathy more frequently reported diffuse paresthesia, burning pain of moderate to high intensity, and instability of sensory disturbances, which tended to fluctuate depending on general health status and psycho-emotional background.

In contrast, patients with diabetic polyneuropathy exhibited more persistent "stocking-type" sensory deficits, pronounced burning sensations, and a gradual progression of motor impairments.

Pain Syndrome

The mean pain intensity on the Visual Analogue Scale (VAS) in Group I was 6.8 ± 1.6 points, which was significantly higher than in Group II (5.3 ± 1.4 points, $p < 0.001$).

On the Total Symptoms Score (TSS), the mean total score was 5.20 ± 4.32 in patients with coronavirus-associated polyneuropathy and 4.61 ± 2.24 in patients with diabetic polyneuropathy. No significant intergroup differences were observed for the overall TSS score; however, analysis of individual components revealed differences in symptom structure.

Sensory Disturbances

The most common sensory disorder in both groups was reduced vibratory sensitivity, observed in 56.1% of patients in Group I and 60.5% in Group II. Temperature sensitivity impairments were noted in 49.1% and 44.7% of patients, respectively.

Hyperesthesia and pronounced hypesthesia were more frequently observed in diabetic polyneuropathy, whereas moderate and unstable sensory disturbances predominated in coronavirus-associated polyneuropathy.

Motor Impairments

Reduced muscle strength in the distal lower limbs was observed in patients from both groups. However, motor deficits were more pronounced in diabetic polyneuropathy and were often accompanied by signs of muscle hypotrophy. Statistically significant intergroup differences were noted in muscles responsible for plantar flexion of the foot ($p < 0.05$).

Anxiety-Affective Disorders

A moderate level of situational anxiety was observed in the majority of patients in both groups, with mean scores of 39.3 ± 7.7 in Group I and 37.4 ± 7.8 in Group II. Trait anxiety was also at a moderate level and was significantly higher compared with the control group ($p < 0.01$).

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Discussion

The results indicate substantial differences in the clinical and neurological profiles of coronavirus- and diabetic-associated polyneuropathy. In the post-COVID form, pain syndrome and anxiety-affective disorders were more pronounced, likely related to neuroinflammatory and immune-mediated mechanisms affecting the peripheral nerves.

Diabetic polyneuropathy is characterized by a more stable and progressive course, with predominance of motor deficits and persistent sensory impairments, reflecting the chronic nature of metabolic and microangiopathic changes.

These findings underscore the need for a differentiated approach to the diagnosis and management of patients, taking into account the etiology of polyneuropathy, symptom structure, and psycho-emotional status.

Conclusions

- Coronavirus-associated polyneuropathy is characterized by higher pain intensity compared with diabetic polyneuropathy.
- Sensory disturbances are similarly prevalent in both forms of polyneuropathy, but differ in clinical structure and stability.
- Motor impairments are more pronounced in diabetic polyneuropathy and are often accompanied by signs of muscle hypotrophy.
- Coronavirus-associated polyneuropathy shows a high frequency of anxiety-affective disorders, which influence patients' subjective symptom perception.

Considering these clinical and neurological features allows for optimization of diagnostic, therapeutic, and rehabilitation strategies in patients with polyneuropathy of different etiologies.

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