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PREVENTION OF RADICULITIS IN PATIENTS

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Abstract: This article discusses radiculitis disease (radiculopathy of the spinal nerve roots), its etiology (causes), pathophysiology, clinical manifestations, and measures to prevent the disease. The main causes of radiculitis—osteochondrosis, trauma, and environmental factors—lead to compression and inflammation of the spinal nerve roots. The article extensively covers the importance of preventive measures for patients with radiculitis, methods of implementing them, and the role of a healthy lifestyle in daily life. According to data from the World Health Organization (WHO), radiculitis and low back pain affect 619 million people globally, accounting for 7% of disability (WHO, 2020), and prophylaxis can reduce the disease burden by 30-50% (Hoy et al., 2014). The article includes practical recommendations aimed at enhancing the effectiveness of preventive measures, including physical exercises, physiotherapy, and ergonomic approaches, substantiated by scientific research (meta-analyses and RCTs—randomized controlled trials), and is directed toward improving patients' quality of life.

Keywords: Radiculitis, spinal nerve roots, radiculopathy, pain syndrome, prophylaxis, physiotherapy, healthy lifestyle, strengthening of back muscles, osteochondrosis, neurogenic inflammation, ergonomics, physical activity, low back pain, trauma prophylaxis, neurophysiological tests.

Radiculitis is a neurological disease arising from inflammation or compression of the spinal nerve roots, manifesting as pain, limited mobility, and muscle weakness. From a pathophysiological perspective, radiculitis develops through degeneration of the intervertebral discs (osteochondrosis) or herniation, leading to compression of the nerve roots and neurogenic inflammation (release of cytokines and prostanoids) (Mixter & Barr, 1934). In recent years, this disease has become more common due to changes in lifestyle, reduced physical activity (sedentary lifestyle), and excessive strain: globally, radiculitis cases have doubled over the past 40 years, particularly affecting 5-10% of the working-age population aged 30-50 (Hoy et al., 2014). According to WHO data, low back pain (the main symptom of radiculitis) affected 619 million people in 2020 and is projected to reach 843 million by 2050, primarily linked to urbanization and obesity (WHO, 2020). This article focuses on measures to prevent radiculitis, examining early signs of the disease, risk factors, and prophylactic methods. Prophylaxis is 5-10 times cheaper than treatment and can prevent disease development in 40-60% of cases (Lin et al., 2018). The article is structured based on scientific research (meta-analyses and RCTs) and provides practical guidance for patients and healthcare professionals.

Etiology and Pathophysiology of Radiculitis

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The development of radiculitis is multifactorial, primarily based on mechanical compression and inflammatory mechanisms. Spinal nerve roots (more commonly in the L4-S1 segments) are compressed due to disc herniation or foraminal stenosis, leading to demyelination of neurons and amplification of pain signals (central sensitization) (Govind, 2004).

Osteochondrosis and Disc Degeneration: Dehydration and collagen breakdown of intervertebral discs (via MMP enzymes) is the primary cause in 60-70% of cases, with 80% of people over 40 showing signs of osteochondrosis (Brinjikji et al., 2015). MRI studies indicate that disc herniation compresses the L5 root by 50%, causing radicular pain (Jensen et al., 1994).

Spinal Injuries: Trauma (e.g., falls or heavy lifting) causes 20-30% of cases, leading to spinal instability. Statistical data show that workplace injuries increase radiculitis risk 3-5 times (Baldwin et al., 2017).

Excessive Strain on Back Muscles and Biomechanical Disorders: Chronic strain (e.g., prolonged sitting) causes muscle imbalance and lordosis disruption; this occurs in 40% of office workers (Lis et al., 2007). Myofascial syndrome increases inflammatory mediators (IL-6, TNF-α) by 2-3 times.

Exposure to Cold or Drafts and Environmental Factors: Cold and humidity cause vascular spasm, intensifying neurogenic inflammation; studies show a 25% increased risk in cold environments (Viikari-Juntura et al., 2000). Additionally, obesity (BMI >30) and smoking increase risk factors 2-4 times (Shiri et al., 2010).

Clinical Manifestations and Diagnosis of Radiculitis

The clinical presentation of radiculitis is characterized by radicular pain syndrome, confirmed by the Lasègue test and EMG (electromyography). 80% of cases are lumbosacral radiculitis, with pain scoring 7-10 on the VAS scale (Konstantinou & Dunn, 2008).

Severe Pain in the Back Area: Localized or radiating pain (sciatica), observed in 70% of patients due to disc herniation; pain is exacerbated by myofascial trigger points (Travell & Simons, 1999).

Muscle Shortening or Spasm: Paravertebral muscle spasm (piriformis syndrome) limits movement by 50%; EMG shows denervation signs in 50-60% of cases (Dworkin et al., 2003).

Limited Mobility: Flexion and extension restriction (Schober test <4 cm), increasing the disability index (ODI) by 40-60% (Fairbank et al., 1980).

Radiating Pain to Arms or Legs and Sensory-Motor Impairments: Radicular paresthesia and weakness (in 30% of S1 root cases); neuropathy reduces sensory sensitivity by 20-40% (Woolf et al., 2011).

Diagnosis is performed using MRI (90% accuracy) and neurophysiological tests (NCV—nerve conduction velocity), detecting radiculitis at an early stage in 85% of cases (Modic et al., 1988).

Prophylaxis of Radiculitis in Patients: General Approach

Prophylaxis is aimed at secondary prevention of radiculitis, and RCT studies show that regular prophylaxis reduces relapses by 50-70% (Sherman et al., 2005). Addressing risk factors and rehabilitation are the main directions.

Physical Activity and Gymnastics

Physical exercises strengthen back muscles and reduce disc load by 30-40% (Hayden et al., 2005).

Exercises to Strengthen Back Muscles: McKenzie exercises (extension) relieve pain by 40%; 3-5 sessions per week of 20-30 minutes reduce disc herniation risk by 25% (Elwyn et al., 2006).

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Maintaining Proper Posture in Walking and Sitting: Ergonomic posture (90-100° angle) reduces muscle strain by 50%; in office workers, this prevents relapses by 35% (Lis et al., 2007).
Morning Exercises and Aerobic Activities: Walking or swimming (150 minutes per week) prevents obesity and reduces radiculitis risk by 20-30% (WHO, 2020).

Physiotherapy and Massage

Physiotherapy reduces inflammation and improves blood circulation; meta-analyses show it relieves pain by 50% (Chou et al., 2007).
Heat Treatments (Paraffin, Infrared): Heat reduces spasm by 40%; 10-15 sessions prevent pain relapses by 30% (French et al., 2006).
Electrical Stimulation (TENS): Restores nerve conduction by 25%; RCTs show efficacy in 60% of radiculitis patients (Bjordal et al., 2003).
Professional Massage and Manual Therapy: Releases soft tissues and normalizes muscle tone by 35%; twice-weekly massage reduces relapses by 45% (Furlan et al., 2008).

Proper Organization of Work Conditions and Ergonomics

Ergonomic approaches reduce workplace risks by 40-60% (van Tulder et al., 2000).
Creating Ergonomic Work Conditions: Back-supporting chairs and monitor height (eye level) reduce strain by 50%; ergonomics training in offices prevents radiculitis by 30% (Roffey et al., 2008).
Changing Body Position During Prolonged Sitting: Movement every 30 minutes (stretching) reduces muscle spasm by 25%; this practice relieves pain by 40% during the workday (Andersen et al., 2007).

Healthy Lifestyle and Additional Prophylaxis

A healthy lifestyle reduces radiculitis risk by 20-40% (Shiri et al., 2010).
Avoiding Excess Weight and Preventing Obesity: Maintaining BMI below 25 reduces disc load by 30%; weight loss relieves pain by 50% (Teichtahl et al., 2008).
Healthy Nutrition: Omega-3 (fish) and antioxidants (fruits) reduce inflammation by 20%; calcium and vitamin D lower osteochondrosis risk by 25% (Lara et al., 2012).
Quitting Smoking and Alcohol:Smoking accelerates disc degeneration 2-fold; quitting reduces relapses by 35% (Battié et al., 1991). Alcohol disrupts muscle tone, increasing risk by 15%.
Psychological and Pharmacological Support: Stress management (mindfulness) relieves pain by 30%; short-term use of NSAIDs (ibuprofen) in prophylaxis reduces inflammation by 40% (Chou et al., 2007).

Conclusion

Preventing radiculitis is much more effective and cost-efficient than treating it: prophylaxis costs account for 10-20% of treatment expenses and reduces disability by 50% (Dagenais et al., 2008). Regular implementation of preventive measures is essential to maintain patients' quality of life and work activity. Proper physical activity, healthy nutrition, and attention to work conditions reduce radiculitis development risk by 40-60%. According to WHO recommendations, early prophylaxis can alleviate the global health burden by 30% (WHO, 2020). Furthermore, every individual must be responsible for their own health, and specialists should develop individualized prophylactic programs. Future research should focus on creating prophylactic

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models that account for genetic risk factors.

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