Review (Review)

A Detailed Look At Autonomic Involvement in Multiple Sclerosis: Clinical and Diagnostic Approach

Multipl Skleroziste Otonomik Tutuluma Detaylı Bir Bakış: Klinik ve Tanısal Yaklaşım

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Özet

Multipl skleroz, merkezi sinir sisteminin otoimmün bir hastalığıdır ve gençlerde engelliliğin en yaygın nedenlerinden biridir. Somatik sinir sisteminde olduğu gibi otonom sinir sistemini de çok çeşitli semptom ve bulgularla etkiler. Hastaların %85'inde otonom sinir sistemi tutulumunun klinik bulguları saptanmıştır. Mesane ve bağırsak sorunları, cinsel, kardiyovasküler, termoregülatuar disfonksiyon, ortostatik hipotansiyon ve yorgunluk otonom sinir sistemi tutulumunun bulguları arasındadır. Otonomik semptomlar en az motor semptomlar kadar özürlülüğe ve yaşam kalitesinde azalmaya neden olur. Hastalar otonomik semptomlar açısından sorgulanmalı ve gerekirse tedavi başlanmalıdır.

Anahtar Kelimeler: Multipl sklerozis, otonomik tutulum, otonom sinir sistemi

Abstract

Multiple sclerosis is an autoimmune disease of the central nervous system and one of the most common causes of disability in young people. It affects the autonomic nervous system, presenting a wide range of symptoms and signs similar to those of the somatic nervous system. Clinical signs of autonomic nervous system involvement were found in 85% of patients. Bladder and bowel problems, sexual dysfunction, cardiovascular dysfunction, thermoregulatory dysfunction, orthostatic hypotension, and fatigue are among the findings of autonomic nervous system involvement. Autonomic symptoms cause disability and decreased quality of life at least as much as motor symptoms. Patients should be questioned regarding autonomic symptoms, and treatment should be initiated if necessary.

Keywords: Multiple Sclerosis, Autonomic involvement, Autonomic nervous system

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INTRODUCTION

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system characterized by inflammation, demyelination, and axonal loss and is one of the most common causes of neurological disability in young people (1). It affects more than 2 million people worldwide (2).

MS affects the somatic and autonomic nervous system with a wide range of symptoms and signs. Autonomic dysfunction may occur in various stages of multiple sclerosis (3). Clinical signs of autonomic nervous system involvement were found in 85% of patients, and laboratory findings in 56% (4). Bladder and bowel problems, sexual, cardiovascular, thermoregulatory dysfunction, orthostatic hypotension, and fatigue are among the findings of autonomic nervous system involvement.

In Which Systems And With Which Clinical Findings Does Autonomic Involvement Occur?

The most common site of autonomic dysfunction in multiple sclerosis is the urinary system (4). Both sympathetic and parasympathetic systems influence the urinary system. While the sympathetic system provides urine storage, activation of the parasympathetic system allows the bladder to empty by contracting the bladder muscles (5). Frequent urination, sudden feeling of urgency, nocturia, intermittent urination, and difficulty at the onset of urination are clinical findings related to autonomic involvement of the urinary system (6). The location of the MS plaque is important in the pathophysiology of urinary system symptoms. The results obtained from studies suggest that disruption of the connections between the sacral and pontine micturition centers causes urinary symptoms. MS plaques are most commonly located on the cervical spinal cord, and the lateral corticospinal (pyramidal) and reticulospinal tracts are frequently affected. Since these two pathways are responsible for the innervation of the bladder detrusor muscle and external urethral sphincter, urinary system dysfunction is frequently encountered in MS (6-8).

The gastrointestinal system is one of the systems in which autonomic dysfunction is seen in MS and affects morbidity. Symptoms of gastrointestinal involvement include diarrhea, constipation, fecal incontinence, nausea, vomiting, and gastroesophageal reflux. Diarrhea and constipation are symptoms highly influenced by autonomic mechanisms, then sympathetic changes triggered by peripheral inflammatory processes may be responsible for the severe diarrhea and constipation found in the early stages of MS (5).

Various clinical findings may occur because of both sympathetic and parasympathetic involvement in the cardiovascular system. Cardiovascular complaints are one of the most common complaints of MS patients, and blood pressure and heart rate fluctuations can be seen frequently. Although it is thought to be caused by lesions in the midbrain, limbic lobe, insula, and parietal lobe, the exact pathophysiology is unknown. The triggering of catecholamine release by inflammatory lesions in the central nervous system may be considered as another mechanism (9).

Another form of autonomic involvement thought to be related to the severity and type of the disease is sexual dysfunction (10). 70% of MS patients complain about this issue (11). The most common symptom is erectile dysfunction (5). Other symptoms include ejaculation disorder, anorgasmia, decreased lubrication, and decreased libido. The parasympathetic system is responsible for erection, and the sympathetic system for ejaculation. Studies have shown that sexual dysfunction is related to total lesion area on magnetic resonance imaging, hypointense lesion area, atrophy on T1-weighted images, and lesion load in the pons (12-14).

Fatigue is a common symptom seen in 90% of MS patients. Studies suggest that autonomic involvement, vagal and sympathetic activity disorders, may be the cause of fatigue. Patients complain of fatigue from the early stages of their disease (15). In previous studies, no correlation was found between fatigue and disease duration and severity (16). This perception of fatigue is thought to be caused by inflammation in the amygdala, hypothalamus, insular cortex, and anterior cingulate cortex (15).

What Tests Are Performed To Detect Autonomic Involvement?

Since urinary system involvement is common in patients with MS, detailed urinary system evaluation should be performed (4). Urinary ultrasonography can be used to investigate urinary retention; urodynamic examination can be used to measure bladder function, urine flow, bladder internal pressure, and pediatric muscle activity; and somatosensory evoked potential can be used for pudendal nerve analysis (3).

Patients should be investigated in the presence of diarrhea, constipation, nausea, vomiting, and gastrointestinal reflux. Anal manometer, colon transit time, external anal electromyography, radionuclide gastric emptying time can be used for gastrointestinal system (5).

Electromyography, heart rate variability measurement, blood pressure measurement, tilt test, handgrip

test, corrected QT distance, and sympathetic skin response can be used to detect autonomic abnormality of the cardiovascular system (3,17).

Sympathetic skin response in the genital area and somatosensory evoked potentials of the pudendal nerve can be used to test sexual dysfunctions in terms of autonomic involvement (3).

Fatigue is a subjective complaint in MS patients. The fatigue severity scale can be used for screening purposes in patients without complaints (18).

Which Treatments Can Be Used in Which System Involvement?

While the sympathetic system provides urine storage, activation of the parasympathetic system allows the bladder to empty by contracting the bladder muscles. In urinary system treatment, bladder emptying is tried to be prevented, and the sphincter is tried to be relaxed, and treatment is decided according to the patient's condition. In overactive bladder, treatments such as oxybutynin and local botulinum toxin injection are used to prevent detrusor hyperactivity. Tricyclic antidepressants may be useful in mild urge incontinence (3).

Pelvic floor muscle training should be recommended in addition to medical treatment. Intermittent and permanent urinary catheterization is recommended in patients who do not respond to medical treatment (3).

Topical estrogen in women and phosphodiesterase 5 inhibitors in men may be used in sexual dysfunctions related to autonomic involvement in MS patients (3).

Patient education is primarily important in autonomic hypotension and postural orthostatic tachycardia syndrome. Volume expanders, vasoconstrictors, and adrenergic antagonists can be used in pharmacotherapy (19).

In addition to non-pharmacologic methods such as sleep hygiene and physical exercise, pharmacologic treatment methods such as Amantadine and Modafinil can also be used to reduce the perception of fatigue (3).

CONCLUSION

Autonomic symptoms seen in MS patients may not be questioned and may be ignored in busy outpatient clinics, but autonomic symptoms cause disability and decreased quality of life at least as much as motor symptoms. Patients should be questioned in terms of autonomic symptoms, and treatment should be initiated if necessary.

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