



MULTIPLE SCLEROSIS: ETIOLOGY, PATHOGENESIS, CLINICAL FEATURES, DIAGNOSIS AND TREATMENT

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Abstract Multiple sclerosis (MS) is a chronic autoimmune disease affecting the central nervous system, characterized by demyelination and neurodegeneration. This article provides a comprehensive overview of the etiology, pathogenesis, clinical manifestations, diagnostic approaches, and modern treatment strategies. Despite the absence of a definitive cure, advances in disease-modifying therapies have significantly improved patient outcomes.

Keywords: multiple sclerosis, autoimmune disease, demyelination, neurology, central nervous system

Introduction Multiple sclerosis is one of the most common neurological disorders among young adults. It primarily affects individuals between the ages of 20 and 40 and is more prevalent in women. The disease leads to progressive disability due to immune-mediated damage to myelin and axons.

MS affects over 2.8 million people worldwide. It is more common in women than men. The prevalence varies geographically, being higher in regions farther from the equator. Environmental and genetic factors both contribute to disease distribution. MS affects over 2.8 million people worldwide. It is more common in women than men. The prevalence varies geographically, being higher in regions farther from the equator. Environmental and genetic factors both contribute to disease distribution. MS affects over 2.8 million people worldwide. It is more common in women than men. The prevalence varies geographically, being higher in regions farther from the equator. Environmental and genetic factors both contribute

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Etiology

The exact cause remains unknown, but MS is considered multifactorial. Genetic predisposition increases susceptibility, while environmental triggers such as viral infections, smoking, and vitamin D deficiency play important roles. The exact cause remains unknown, but MS is considered multifactorial. Genetic predisposition increases susceptibility, while environmental triggers such as viral infections, smoking, and vitamin D deficiency play important roles. The exact cause remains unknown, but MS is considered multifactorial. Genetic predisposition increases susceptibility, while environmental triggers such as viral infections, smoking, and vitamin D deficiency play important roles. The exact cause remains unknown, but MS is considered multifactorial. Genetic predisposition increases susceptibility, while environmental triggers such as viral infections, smoking, and vitamin D deficiency play important roles. The exact cause remains unknown, but MS is considered multifactorial. Genetic predisposition increases susceptibility, while environmental triggers such as viral infections, smoking, and vitamin D deficiency play important roles. The exact cause remains unknown, but MS is considered multifactorial. Genetic predisposition increases susceptibility, while environmental triggers such as viral infections, smoking, and vitamin D deficiency play important roles.

Pathogenesis

MS involves immune-mediated destruction of myelin. T-cells cross the blood-brain barrier and trigger inflammation. This leads to demyelination, axonal damage, and plaque formation in the brain and spinal cord. MS involves immune-mediated destruction of myelin. T-cells cross the blood-brain barrier and trigger inflammation.

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Clinical Features

Symptoms vary depending on lesion location but commonly include visual disturbances, muscle weakness, coordination problems, fatigue, sensory disturbances, and cognitive impairment. The disease often follows a relapsing-remitting course.

Types of Multiple Sclerosis

1. Relapsing-remitting MS (RRMS)
2. Secondary progressive MS (SPMS)
3. Primary progressive MS (PPMS)
4. Progressive-relapsing MS (rare)

Diagnosis

Diagnosis is based on clinical evaluation and paraclinical tests including MRI, cerebrospinal fluid analysis, and evoked potentials. MRI is the most sensitive tool for detecting demyelinating lesions.

Treatment

Although there is no cure for MS, treatment focuses on managing symptoms and slowing disease progression. Therapies include corticosteroids for acute relapses, disease-modifying therapies (DMTs), and symptomatic treatments.

Rehabilitation

Rehabilitation plays a crucial role in improving quality of life. Physical therapy, occupational therapy, and speech therapy help patients maintain functional independence.

Prevention and Lifestyle

Healthy lifestyle choices such as balanced nutrition, regular exercise, stress management, and adequate vitamin D levels may help reduce disease severity and improve overall health.

Conclusion Multiple sclerosis is a complex disease requiring multidisciplinary management. Ongoing research continues to explore new therapeutic options aimed at improving long-term outcomes.

MS remains a challenging disease, but advances in medicine offer hope for improved management and potential future cures. MS remains a challenging disease, but advances in medicine offer hope for improved management and potential future cures. MS remains a challenging disease, but advances in medicine offer hope for improved management and potential future cures. MS remains a challenging disease, but advances in medicine offer hope for improved management and potential future cures. MS remains a challenging disease, but advances in medicine offer hope for improved management and potential future cures. MS remains a challenging disease, but advances in medicine offer hope for improved management and potential future cures.

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