



MULTIPLE SCLEROSIS OVERVIEW

Definition

Multiple sclerosis (MS) is a chronic, inflammatory disease that involves **immune-mediated attacks** on the central nervous system. It is characterized by relapses and remissions of neurological symptoms and progression of functional disability over time. Abnormal immune activity creates inflammation and damage to the myelin sheath, axons and oligodendrocytes.

Epidemiology

MS is usually diagnosed between the ages of 20 and 50 with a **prevalence** of nearly 1 million in the U.S. It is less frequently diagnosed in young children and older adults. Individuals assigned female at birth are more likely to develop MS than those assigned male at birth. MS was historically believed to primarily affect Caucasians; recent studies suggest a higher incidence in African Americans than previously thought.

Etiology

The cause of MS is unknown, although **genetic and environmental factors** may contribute to a person's risk of developing the disease. The thought is that a combination of factors trigger the disease—environmental factors, multiple genes and immune dysregulation.

Environment factors:

- Smoking (active and passive)
- Obesity in childhood and adolescence
- Low vitamin D
- Epstein-Barr virus exposure

Genetic factors:

Over 200 genes have been identified that confer some increased risk for the development of MS.

Familial risk:

- 1/750 for the general population (0.1%)
- 1/4 for an identical twin (25%)
- 1/40 for those with first-degree relative with MS (3%)
- 20% of people with MS have a blood relative with MS

Diagnosis

MS is a **clinical diagnosis**:

- Medical history suggestive of CNS process
- Neurological exam findings

Paraclinical tests provide support:

- Magnetic resonance imaging
 - Lesions (hyperintensities on T2 weighted images) in the brain (periventricular, juxtacortical/cortical or infratentorial regions) and spinal cord
- Spinal fluid analysis
 - Oligoclonal bands present in the CSF and not in the serum
 - Elevated IgG index
- Serum analysis
 - Rule out conditions that mimic MS, such as CNS infection, lupus, NMO, B12 deficiency, Lyme disease, neurosarcoidosis and other metabolic, familial or autoimmune conditions affecting the CNS

Diagnostic criteria:

- Dissemination in time and space: evidence that damage has occurred in at least two separate areas of the CNS at different points in time
- There must be no other explanation

Signs and Symptoms Consistent with MS

- **Vision problems:** visual-blurred vision, unilateral vision loss, oscillopsia, diplopia, nystagmus
- Motor: trunk/extremity **weakness, spasticity**, hyperreflexia, **gait disturbance**, imbalance
- Sensory: **numbness, paresthesias, dysethesias, Lhermitte's sign, squeezing around torso**, proprioception deficits, **trigeminal neuralgia**
- Cerebellar: **tremor**, ataxia, incoordination
- Elimination dysfunction: **urinary frequency, urgency or retention, incontinence, frequent UTI**, and **constipation**
- **Mood and cognition:** depression, anxiety or impairment of memory, attention, concentration or information speed processing

Preventive Health Maintenance for Patients with MS

MS is not typically a fatal disease. People with MS live an average of 7 years less than the general population because of disease complications or comorbidities, like heart disease or stroke. Many of these comorbidities are preventable or manageable with regular and ongoing primary care.

Treatment

Management of MS across the lifetime requires a **comprehensive** approach, including **rehabilitation**, specialty care and **lifestyle management** interventions. **Disease modifying therapies** are available to reduce the frequency of relapses and delay progression of disability. **Relapses** can be treated with high-dose glucocorticoids. **Symptoms** can be managed with medications and non-pharmacological strategies, like PT/OT, cognitive behavioral therapy and SLP, etc.