# Difference Between Multiple Sclerosis and Systemic Sclerosis

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## Key Difference – Multiple Sclerosis vs Systemic Sclerosis

Both multiple sclerosis and systemic sclerosis are autoimmune diseases whose pathogenesis is triggered by undiscovered environmental and genetic factors. Multiple Sclerosis is a chronic autoimmune, T-cell mediated inflammatory disease affecting the central nervous system whereas systemic sclerosis, also known as scleroderma, is an autoimmune multisystem disease with a progressively worsening clinical picture. The key difference between multiple sclerosis and systemic sclerosis is that **multiple sclerosis affects only the central nervous system but systemic sclerosis is a multisystem disease that affects almost all systems in the body.**

# What is Multiple Sclerosis?

Multiple Sclerosis is a chronic autoimmune, T-cell mediated inflammatory disease affecting the central nervous system. Multiple areas of demyelination are found in the brain and the spinal cord. The incidence of MS is higher among women. MS mostly occurs between 20 and 40 years of age. The prevalence of the disease varies according to the geographical region and ethnic background. The patients with MS are susceptible to other autoimmune disorders. Both genetic and environmental factors influence the pathogenesis of the disease. Three commonest presentations of MS are optic neuropathy, brain stem demyelination, and spinal cord lesions.

## Pathogenesis

T cell-mediated inflammatory process occurs mainly within the white matter of the brain and spinal cord producing plaques of demyelination. 2-10mm sized plaques are usually found in the optic nerves, periventricular region, corpus callosum, brain stem and its cerebellar connections and cervical cord.

In MS, peripheral myelinated nerves are not directly affected. In the severe form of the disease, permanent axonal destruction occurs resulting in progressive disability.

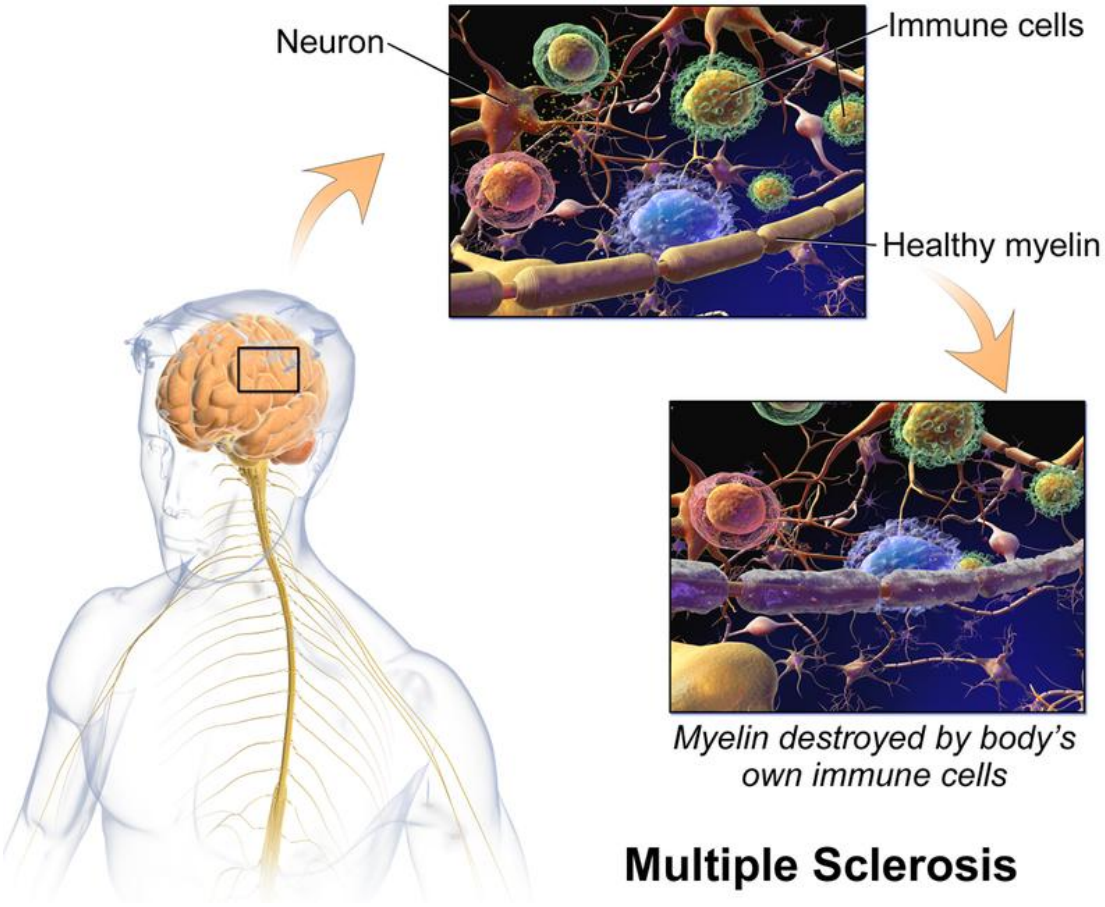


**Figure 01: Multiple Sclerosis**

# Types of Multiple Sclerosis

- Relapsing-remitting MS
- Secondary progressive MS
- Primary progressive MS
- Relapsing-progressive MS

# Common Signs and Symptoms

- Pain on eye movements
- Mild fogging of central vision/color desaturation/dense central scotoma
- Reduced vibration sensation and proprioception in feet
- Clumsy hand or limb
- Unsteadiness in walking
- Urinary urgency and frequency
- Neuropathic pain
- Fatigue
- Spasticity

- Depression
- Sexual dysfunction
- Temperature sensitivity

In late MS, severe debilitating symptoms with optic atrophy, nystagmus, spastic tetraparesis, ataxia, brainstem signs, pseudobulbar palsy, urinary incontinence and cognitive impairment can be seen.

## Diagnosis

Diagnosis of MS can be made if the patient has had 2 or more attacks affecting different parts of the CNS. MRI is the standard investigation used for the confirmation of clinical diagnosis. CT and CSF examination can be done to provide further supportive evidence for the diagnosis if necessary.

## Management

There is no definitive cure for MS. But several immunomodulatory drugs have been introduced to modify the course of the inflammatory relapsing-remitting phase of MS. These are known as Disease Modifying Drugs (DMDs). Beta-interferon and glatiramer acetate are examples of such drugs. Apart from drug therapy, general measures such as physiotherapy, supporting the patient with the help of a multidisciplinary team and occupational therapy can vastly improve the living standards of the patient.

## Prognosis

The prognosis of multiple sclerosis varies in an unpredictable manner. A high MR lesion load at the initial presentation, high relapse rate, male gender and late presentation are usually associated with a poor prognosis. Some patients continue to live a normal life with no apparent disabilities while some can get severely disabled.

# What is Systemic Sclerosis?

Systemic sclerosis, which is also known scleroderma. is an autoimmune multisystem disease with a progressively worsening clinical picture.

## Risk Factors

Exposure to

- Vinyl chloride
- Silica dust
- Adulterated rapeseed oil
- Trichloroethylene

## Clinical Features

- Tight skin over face, small mouth, beak nose and telangiectasia
- Dysmotility or strictures of esophagus
- Myocardial fibrosis
- Scleroderma and renal crisis
- Pulmonary hypertension or pulmonary fibrosis
- Malabsorption, hypomotility of intestine and fecal incontinence
- Raynaud's phenomenon

## Investigations

- Full blood count – a full blood count usually reveals the presence of a normochromic, normocytic anemia.
- Urea and electrolytes – urea and electrolyte level can be elevated in scleroderma-associated renal injury
- Testing for the antibodies such as ACA and ANA that are typically seen in systemic sclerosis
- Urine microscopy
- Imaging
- Chest X-ray – this can be used to exclude any other pathological conditions that may have a similar clinical picture. In addition to that this can be helpful in identifying any abnormal cardiac or pulmonary changes.
- X-ray of a hand – this can show the deposits of calcium that have accumulated around the bones of fingers.
- GI endoscopy can reveal any abnormalities in the esophagus
- High-resolution CT can be done to identify any fibrotic lung involvement

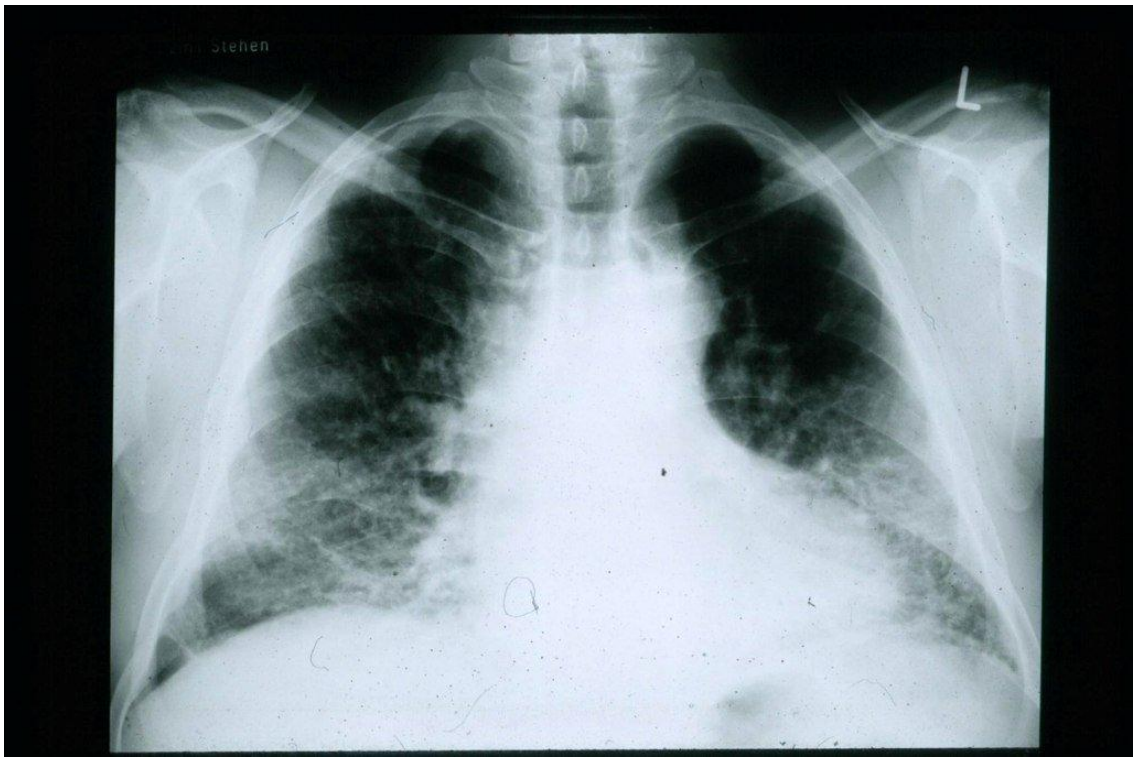

**Figure 02: Pulmonary Fibrosis in Systemic Sclerosis**

## Management

There is no definite cure for systemic sclerosis. Rather surprisingly, the corticosteroids and immunosuppressants have been proven to be less effective in the management of this condition. An organ-specific approach in treating the disease can be useful in avoiding long-term complications associated with systemic sclerosis.

- Patient counseling and family support are extremely important
- The use of skin lubricants and skin exercises can limit the development of contractures
- Hand warmers and oral vasodilators can be used to control Raynaud's effect
- Proton pump inhibitors are usually prescribed to alleviate the esophageal symptoms
- ACE inhibitors are the drug of choice in the management of renal impairment
- Pulmonary hypertension should be treated with oral vasodilators, oxygen, and warfarin

## Prognosis

The mild form of the disease has a better prognosis than the diffuse disease. Extensive pulmonary fibrosis is usually the leading cause of death among the scleroderma patients.

## What are the Similarities Between Multiple Sclerosis and Systemic Sclerosis?

- Both multiple sclerosis and systemic sclerosis are autoimmune diseases.
- Both diseases do not have a definite cure.

## What is the Difference Between Multiple Sclerosis and Systemic Sclerosis?

| Multiple Sclerosis vs Systemic Sclerosis | |
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| Multiple Sclerosis is a chronic autoimmune, T-cell mediated inflammatory disease affecting the central nervous system. | Systemic sclerosis is an autoimmune multisystem disease with a progressively worsening clinical picture. |
| **Risk Factors** | |
| Female gender and genetic predisposition are the major known factors. | Exposure to Vinyl chloride, silica dust, adulterated rapeseed oil, and trichloroethylene are the risk factors. |
| **Clinical Features** | |
| The early disease is characterized by the following clinical features.<br>· Pain on eye movements<br>· Mild fogging of central vision/color desaturation/dense central scotoma<br>· Reduced vibration sensation and proprioception in feet<br>· Clumsy hand or limb | The thickening of the skin in different regions of the body is the most prominent clinical sign.<br>In addition to that, the following features can also be frequently seen.<br>· Tight skin over face, small mouth, beak nose and telangiectasia<br>· Dysmotility or strictures of esophagus |

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| · Unsteadiness in walking<br>· Urinary urgency and frequency<br>· Neuropathic pain<br>· Fatigue<br>· Spasticity<br>· Depression<br>· Sexual dysfunction<br>· Temperature sensitivity<br><br>In late MS, severe debilitating symptoms can be seen with<br><br>• optic atrophy<br>• nystagmus<br>• spastic tetraparesis<br>• ataxia<br>• brainstem signs<br>• pseudobulbar palsy<br>• urinary incontinence<br>• cognitive impairment | · Myocardial fibrosis<br>· Scleroderma and renal crisis<br>· Pulmonary hypertension or pulmonary fibrosis<br>· Malabsorption, hypomotility of intestine and fecal incontinence<br>· Raynaud's phenomenon |
| **Diagnosis** | |
| • A diagnosis of MS can be made if the patient has had 2 or more attacks affecting different parts of the CNS.<br>• MRI is the standard investigation used for the confirmation of clinical diagnosis.<br>• CT and CSF examination can be done to provide further supportive evidence for the | The following investigations are done for the diagnosis of multiple sclerosis as well as for the assessment of disease progression.<br>· Full blood count |

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| diagnosis if necessary. | · Urea and electrolytes<br>· Testing for the antibodies such as ACA and ANA that are typically seen in systemic sclerosis<br>· Urine microscopy<br>· Chest X-ray<br>· X-ray of a hand<br>· GI endoscopy can reveal any abnormalities in the esophagus<br>· High-resolution CT can be done to identify any fibrotic lung involvement |
| **Treatment** | |
| • There is no definitive cure for MS.<br>• Several immunomodulatory drugs known as Disease Modifying Drugs (DMDs), have been introduced to modify the course of the inflammatory relapsing-remitting phase of MS.<br>• Beta-interferon and glatiramer acetate are examples of such drugs.<br><br>General measures such as physiotherapy, supporting the patient with the help of a multidisciplinary team and occupational therapy can vastly improve the living standards of the patient. | Therefore the management aims at controlling the severity of the symptoms and arresting the disease progression.<br>· Patient counseling and family support are extremely important<br>· The use of skin lubricants and skin exercises can limit the development of contractures<br>· Hand warmers and oral vasodilators can be used to control Raynaud’s effect |

- Proton pump inhibitors are usually prescribed to alleviate the esophageal symptoms
- ACE inhibitors are the drug of choice in the management of renal impairment
- Pulmonary hypertension should be treated with oral vasodilators, oxygen, and warfarin

## Summary – Multiple Sclerosis vs Systemic Sclerosis

Multiple Sclerosis is a chronic autoimmune, T-cell mediated inflammatory disease affecting the central nervous system whereas systemic sclerosis which is also known scleroderma is an autoimmune multisystem disease with a progressively worsening clinical picture. The main difference between multiple sclerosis and systemic sclerosis is that multiple sclerosis only affects the central nervous system while systemic sclerosis extends its effect over almost all the systems of the body.

**References:**

1. Kumar, Parveen J., and Michael L. Clark. Kumar & Clark clinical medicine. Edinburgh: W.B. Saunders, 2009. Print.

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**APA:** Difference Between Multiple Sclerosis and Systemic Sclerosis. (2017, October 06). Retrieved (date), from http://differencebetween.com/ difference-between-multiple-sclerosis-and-vs-systemic-sclerosis/

**MLA:** "Difference Between Multiple Sclerosis and Systemic Sclerosis" *Difference Between.Com*. 06 October 2017. Web.

**Chicago:** “Difference Between Multiple Sclerosis and Systemic Sclerosis.” *Difference Between.Com*. http://differencebetween.com/ difference-between-multiple-sclerosis-and-vs-systemic-sclerosis/ accessed (accessed [date]).