Difference Between Multiple Sclerosis and Motor Neuron Disease

Key Difference – Multiple Sclerosis vs Motor Neuron Disease

Several inflammatory disorders can affect the central nervous system. Multiple Sclerosis is the most common neuroinflammatory disease among them. Motor Neuron Disease (MND) is a neurodegenerative disorder affecting the CNS. Neurodegenerative diseases are characterized by the progressive loss of neurons. These disorders are mostly seen in the old age. Dementia and MND are examples of neurodegenerative diseases. Thus, the key difference between multiple sclerosis and motor neuron disease is that **multiple sclerosis is a neuroinflammatory disease while MND is a neurodegenerative disease.**

What is Motor Neuron Disease (MND)?

Motor neuron disease (MND) is a serious medical condition which causes progressive weakness and eventually the death due to respiratory failure or aspiration. The annual incidence of the disease is 2/100000, which indicates that the disease is relatively uncommon. In some countries, this disorder is identified as Amyotrophic Lateral Sclerosis (ALS). Individuals between 50 to 75 years of age are usually the victims of this disease. In MND, sensory system is spared. Therefore, sensory symptoms such as numbness, tingling and pain do not occur.

Pathogenesis

Upper and lower motor neurons in the spinal cord, cranial nerve motor nuclei and cortices are the main components of the CNS affected by MND. But, other neuronal systems may also get affected. For example, in 5% of the patients, Frontotemporal dementia can be seen whereas in 40% of the patients' frontal lobe cognitive impairment is observed. The cause of MND is unknown. But it is widely believed that protein aggregation in the axons is the underlying pathogenesis that causes MND. Glutamate mediated excitotoxicity and oxidative neuronal damage are also involved in the pathogenesis.

Clinical Features

In MND, four main clinical patterns are seen; these may merge with the progression of the disease.

Amyotrophic Lateral Sclerosis (ALS) – This is the typical paraneoplastic presentation which usually starts from one limb and then spreads gradually to other limbs and trunk muscles. Clinical presentation will be focal muscle weakness and wasting, with muscle fasciculation. Cramps are common. On examination, brisk reflexes, extensor plantar responses, and spasticity, which are signs of upper motor neuron lesions can be found. Severe worsening of the symptoms over months will confirm the diagnosis.

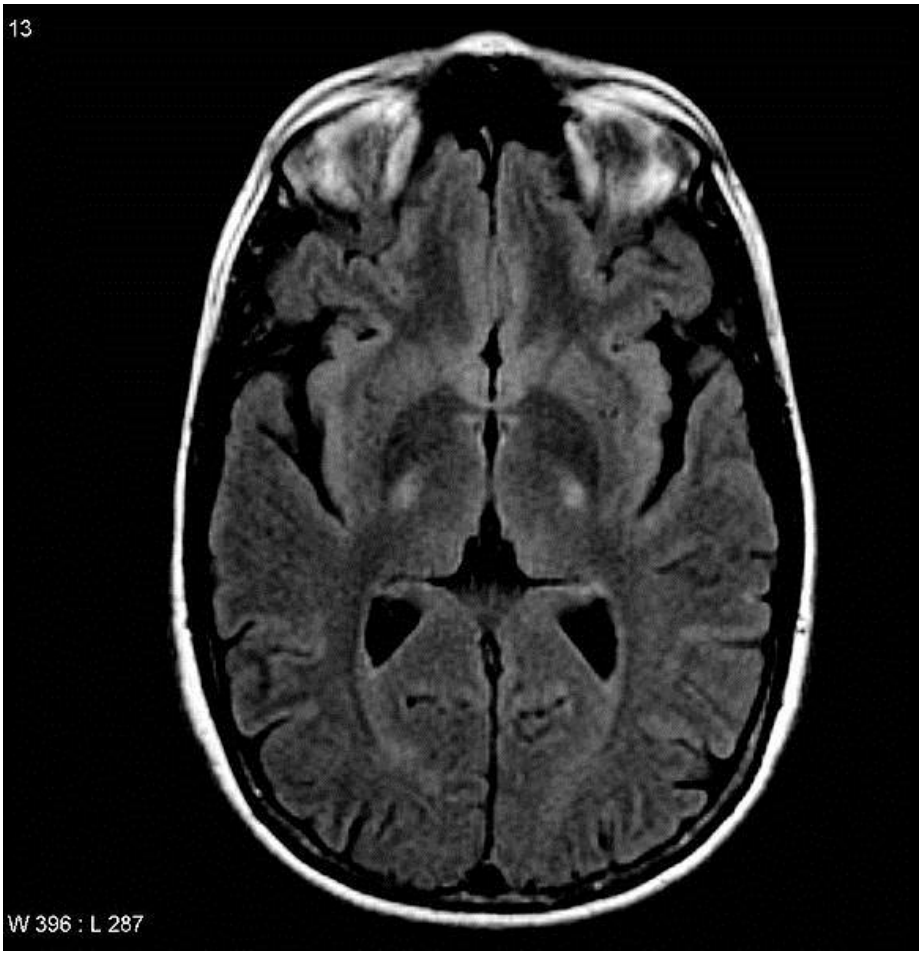

Figure 01: Amyotrophic Lateral Sclerosis

Progressive Muscular Atrophy – This causes weakness, muscle wasting, and fasciculation. These symptoms usually begin in one limb and then spread to the adjacent spinal segments. This is a pure lower motor neuron lesion presentation.

Progressive Bulbar and Pseudobulbar Palsy – Presenting symptoms are dysarthria, dysphagia, nasal regurgitation of fluids and chocking. These occur due to the involvement of lower cranial nerve nuclei and their supranuclear connections. In a mixed bulbar palsy, fasciculation of the tongue with slow, stiff tongue movements can be observed. In pseudobulbar palsy, emotional incontinence with pathological laughter and crying can be seen.

Primary Lateral Sclerosis – This is a rare form of MND, which causes gradually progressive tetraparesis and pseudobulbar palsy.

Diagnosis

The diagnosis of the disease is primarily based on the clinical suspicion. Investigations can be done in order to exclude other possible causes. EMG can be done to confirm the denervation of the muscles due to the degeneration of the lower motor neurons.

Prognosis and Management

No treatment has been shown to improve the outcome. Riluzole can slow the progression of the disease, and it can increase the life expectancy of the patient by 3-4 months. Feeding via a gastrostomy and non-invasive ventilator support is helpful in prolonging the survival of the patient although survival for more than 3 years is unusual.

What is Multiple Sclerosis (MS)?

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.

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.

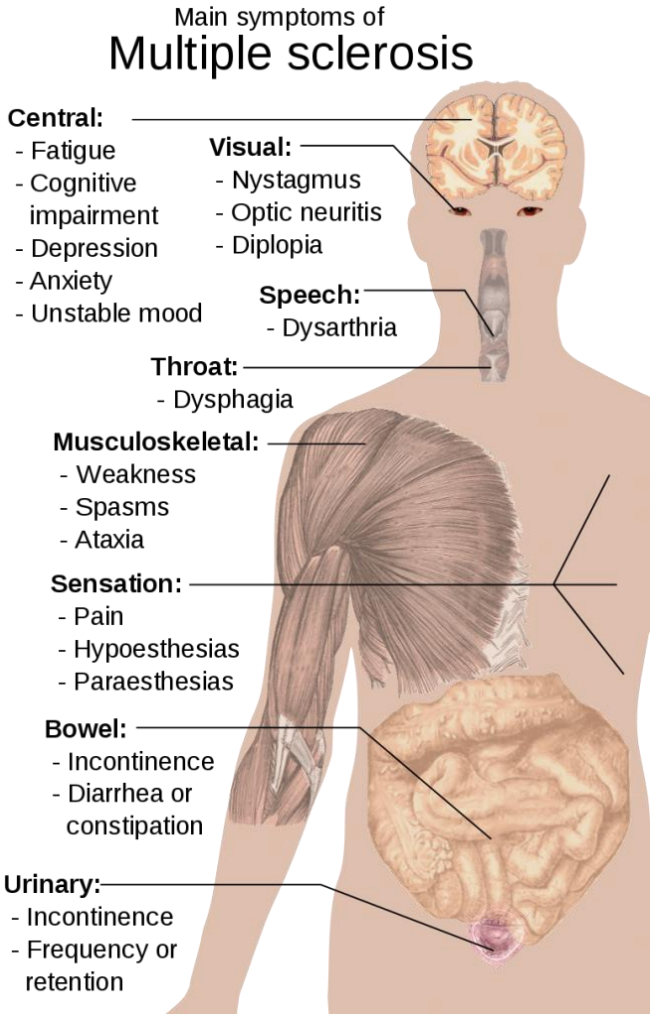

Figure 2: Signs and Symptoms of Multiple Sclerosis

Diagnosis

A diagnosis of MS can be made if the patient has had 2 or more attacks affecting different parts of the CNS. Investigations like MRI, CT and CSF examination can be done in order to provide supportive evidence for the diagnosis.

Management and Prognosis

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.

What are the similarities between Multiple Sclerosis and Motor Neuron Disease

- Multiple sclerosis and motor neuron disease affect the nervous system
- There is no definitive cure for both these disorders.

What is the difference between Multiple Sclerosis and Motor Neuron Disease?

Multiple Sclerosis vs Motor Neuron Disease	
Multiple Sclerosis is a chronic autoimmune, T-cell mediated inflammatory disease affecting the Central Nervous System.	MND is a serious medical condition which causes progressive weakness and eventually the death due to respiratory failure or aspiration.
Type of Disease	
Mulitple sclerosis is a neuroinflammatory disorder.	MND is a neurodegenerative disorder
Age Group	
Multiple sclerosis affects relatively young individuals between 20 to 40 years of age.	Patients are usually between 50 to 70 years of age.
Sex	
The incidence of multiple sclerosis is higher among women.	MND occurs mainly among men.
Pathogenesis	
Multiple sclerosis is caused by the demyelination of the neurons.	Accumulation of proteins in the axons is the underlying pathogenesis of MND.

Summary – Multiple Sclerosis vs Motor Neuron Disease

MND is a neurodegenerative disease where the symptoms worsen at a rapid pace. Although multiple sclerosis, which is a neuroinflammatory disorder, progresses at a relatively slow rate, it can also cause serious neuronal impairments. This is the main difference between multiple sclerosis and motor neuron disease.

References:

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

Image Courtesy:

1. "ALS cross" By Frank Gaillard – (CC BY-SA 3.0) via Commons Wikimedia
2. "Symptoms of multiple sclerosis" By Mikael Häggström – (Public Domain) via Commons Wikimedia

How to Cite this Article?

APA: Difference Between Multiple Sclerosis and Motor Neuron Disease. (2017, August 11). Retrieved (date), from http://differencebetween.com/difference-between-multiple-sclerosis-and-vs-motor-neuron-disease/

MLA: "Difference Between Multiple Sclerosis and Motor Neuron Disease" *Difference Between.Com*. 11 August 2017. Web.

Chicago: "Difference Between Multiple Sclerosis and Motor Neuron Disease." *Difference Between.Com*. http://differencebetween.com/difference-between-multiple-sclerosis-and-vs-motor-neuron-disease/ accessed (accessed [date]).