Multiple Sclerosis

Fact Sheet

What is Multiple Sclerosis?

Multiple sclerosis (MS) is a **progressive disease of the central nervous system** where an immune response destroys brain, optic nerve and spinal cord tissue[1] [2] leading to irreversible motor disability and cognitive impairment over time.[3] Typically, **diagnosis occurs between the ages of 20 and 40**[4], greatly impacting a person's career, income and family life.[5] [6] Affecting over **1.1 million people across Europe**[7], MS brings with it considerable costs to health and social welfare systems, as well as the wider economy in terms of decreased productivity from both people with MS and their carers.[8] [9] [10] [11] [12] The unpredictable and invisible nature of some symptoms makes it particularly challenging to diagnose and manage. Furthermore, the personal and societal impact of MS grows significantly as the condition progresses and disability worsens.[13] [14] [15]

Key facts

MS is a chronic, progressive, potentially disabling disorder with a considerable social impact and economic consequences despite its relatively limited prevalence. It is a **major cause of non-traumatic disability in young adults**.[16]

A total of **2.8 million** people are estimated to live with MS **worldwide** (35.9 per 100,000 population).[17]

The mean age of diagnosis is **32 years**.[18]

Women are twice as likely to live with MS as men.[19]

History

Multiple sclerosis was first recognised as a condition in the middle of the 19th century. Prior to this time, there are reports of a few instances of what may have been MS, although the variety of symptoms, the range of other possible causes and the incompleteness of records make these impossible to confirm.[20]

In the 1868 the French neurologist Jean-Martin Charcot was the first person to recognize multiple sclerosis as a distinct disease. Charcot was a French scientist, instructor, and physician who is claimed by some to be the founder of modern neurology. He lived during the 1800s and Sigmund Freud was among the famous students he inspired. In addition to the many neurological disorders that he defined and treated, he was also known for his treatment of hysteria with hypnotism, which he believed was hereditary and caused by weaknesses in one's neurological system.

Throughout the 1800s and 1900s, hundreds of therapies were tried, without success, in the treatment of multiple sclerosis. Deadly nightshade (a plant with poisonous fruit), arsenic, mercury, and the injection of malaria parasites, are just a few examples of the types of ineffective and even dangerous therapies that were once given to individuals with MS.

In 1951, cortisone (a steroid) was first used to treat MS relapses (also known as exacerbations, attacks, or symptom flare-ups). Cortisone was found to reduce the severity of the relapse and to shorten its duration, but it had no long-term effects on the disease.

Presently, more than 20 brand-name and generic medications are now approved for relapsing forms of MS, with some recent approvals that include primary-progressive MS (PPMS) and "active" (with relapses still occurring) secondary-progressive MS (SPMS). Research continues into other experimental medications for MS and more approvals are anticipated.[21]

Known causes of Multiple Sclerosis

A substance called myelin protects the nerve fibres in the central nervous system, which helps messages travel quickly and smoothly between the brain and the rest of the body.

In MS, the immune system, which normally helps to fight off infections, mistakes myelin for a foreign body and attacks it. Researchers do not know what triggers the immune system to attack myelin, but it is thought to be a combination of genetic and environmental factors.

Genetic factors:
MS is not thought to be a hereditary disease. However, the risk of getting MS is higher in relatives of a person with the disease than in the general population, especially in the case of siblings, parents and children.

Environmental factors:
Various environmental factors – infectious and non-infectious – have been proposed as risk factors for MS.

MS is more common in people who live further away from the equator. The reason for this is not clear, but decreased sunlight exposure has been linked with a higher risk of MS and there is growing evidence that a lack of vitamin D is linked to increasing prevalence in a range of conditions including MS.

Smoking is another environmental factor that seems to be strongly associated with MS.[22]

Symptoms

Multiple sclerosis is a variable condition and the symptoms depend on which areas of the central nervous system have been affected. There is no set pattern to MS and everyone with MS has a different set of symptoms, which vary from time to time and can change in severity and duration, even in the same person.

There is no typical MS. Most people with MS will experience more than one symptom, and though there are symptoms common to many people, no person would have all of them.

The most common MS symptoms are fatigue, pain, bladder and bowel issues, sexual dysfunction , movement and coordination problems, visual problems and cognition and emotional changes. However, any neurological symptom or sign may be part of a person's MS.[23]

Diagnosis

MS is complex and can cause many different symptoms. Early MS may present itself as a history of vague symptoms, which may occur sporadically over a prolonged period of time and could often also be attributed to a number of other medical conditions. Invisible or subjective symptoms are often difficult to communicate to doctors and health professionals and it is not uncommon for a diagnosis to take several months, and frustratingly it can take even longer.

There are a range of tests that can be used to find out if someone has MS or not, but there is no single test to diagnose MS which is conclusive on its own. The tests include:

Neurological examination: A physical examination by a neurologist checks for changes or weaknesses in eye movements, leg or hand coordination, balance, sensation, speech or reflexes. Whilst a neurologist may strongly suspect MS at this stage, a diagnosis won't be given until other test results confirm MS.

Magnetic resonance imaging (MRI): MRI is extremely sensitive in revealing lesions typical for MS at the level of the brain, spinal cord and optic nerve. For this reason, this tool has been formally included into the diagnostic work-up of patients with a suspicious of MS. In addition, powerful MRI techniques have been used to study inflammation and tissue damage in regions of the brain, for which conventional MRI techniques are not sensitive enough. Several of these non-conventional MRI techniques are being developed for use in the diagnosis of MS.

Evoked potentials: Evoked potential testing involves measuring the time it takes for the brain to receive messages from the eyes, limbs, etc. Due to the involvement of myelin, a prolongation of this time is usually observed in MS.

Lumbar puncture: During a lumbar puncture (or spinal tap), the neurologist inserts a needle into the space around the spinal cord, under local anaesthetic. A small sample of the fluid that flows around the brain and spinal cord, called 'cerebrospinal fluid', is taken out and tested for abnormalities that occur in MS.[24]

Treatment

There's currently no cure for MS, but a number of treatments can help control the condition. It may include:

- treating relapses with short courses of steroids to speed up recovery
- specific treatments for individual MS symptoms
- treatment to reduce the number of relapses and MRI lesions using medicines called disease-modifying therapies

Disease-modifying therapies may also help to slow or reduce the overall worsening of disability in people with a type of MS called relapsing remitting MS, and in those with a type called secondary progressive MS who have relapses.

Many therapies aiming to treat progressive MS are currently being researched.[25]

Futher information

International MS Federation
www.msif.org

MS Brain Health
www.msbrainhealth.org

World MS Day
www.worldmsday.org

Shift.ms
www.shift.ms

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