Treating Multiple Sclerosis

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Abstract

The treatment of multiple sclerosis is growing more complex as new disease-modifying medications become available. Using consensus statements is thus recommended. The current consensus statement, developed by the study group on demyelinating illnesses of the Spanish Society of Neurology, updates earlier consensus statements on the disease.

The current study lists and assesses the drugs currently approved for multiple sclerosis as well as their official indications, as well as therapy-related features such as activity, early treatment, maintenance, follow-up, treatment failure, medication adjustments, and unusual therapeutic scenarios. This consensus statement includes recommendations for initial therapy and changes in drug medication, as well as additional comments on induction and combined therapy and practical aspects of the use of these drugs. These recommendations cover a wide range of demyelinating diseases, from isolated demyelinating syndromes to the various forms of multiple sclerosis.

Keywords: Multiple Sclerosis• Central nervous System • Clinically isolated syndrome

Introduction

Multiple Sclerosis (MS) is a Central Nervous System (CNS) illness marked by inflammation, demyelination, glial scarring, and axonal destruction, resulting in variable degrees of neurological disability. MS typically affects young individuals and is two to three times more common in women. It causes relapses, which are episodes of neurological impairment that last a few days or weeks and cure partially or entirely, especially in the early stages of the disease. MS causes increasing neurological deterioration in a small minority of people (about 10%) [1,2]. The accompanying symptoms are very diverse. The first episode, sometimes referred to as Clinically Isolated Syndrome (CIS), is marked by symptoms that could be caused by brainstem, spinal cord, or ocular involvement. Even while symptoms normally go away, relapses have long-term effects.

The course of a disease can also change. In the initial period, which typically lasts several years, relapses occur seldom. Relapses start to occur less frequently after ten to fifteen years. About half of all patients will experience progressive deterioration, sometimes known as "secondary progressive MS." Degeneration, which is linked to irreversible damage to axons and neurons beginning in the early stages of the disease and becoming more significant in later stages, and autoimmune inflammation, which is typical of the initial stages and manifests as relapses and demyelinating lesions in white and grey matter on MR images, are the two distinct features of MS [3-5].

Given its prevalence, the accompanying disability it causes in young adults, the disruption it causes to work productivity, the associated need for care, and the high expense of treatment, the human and socioeconomic impact of MS is debatable. This document is an updated version of the consensus document on demyelinating illnesses that the Spanish Society of Neurology research committee released in 2010 [6].

Approved drugs for multiple sclerosis

In the last 20 years, the European Union has approved 11 medications as MS therapies, including azathioprine in various specific nations, including Spain.

All of these medicines have improved various clinical factors (relapse frequency and, to a lesser extent, cumulative impairment) as well as MRI results. Interferon beta 1b (Betaferon®) was the first of these medications to be approved, followed by intramuscular (IM) interferon beta 1a (Avonex®), subcutaneous (SC) interferon beta 1a (Rebif®), and glatiramer acetate (Copaxone®). Mitoxantrone (Novantrone®) was then approved, followed a few years later by the first monoclonal antibody, natalizumab (Tysabri®). The first medication to be used orally was fingolimod (Gilenya®). The two most current medications, teriflunomide (Aubagio®) and dimethyl fumarate (Tecfidera®), a monoclonal antibody called alemtuzumab (Lemtrada®), and pegylated interferon beta 1a (Plegridy®), were all authorised in 2014 [7-10].

The outcomes of clinical trials were used to approve each of these medications [11]. They have all been shown to be effective for treating relapsing-remitting MS; several of these medications are also effective against CIS because they have been shown to postpone the onset of new MRI lesions or further demyelinating episodes; others have been shown to be effective in treating patients with secondary progressive MS that is accompanied by relapses. None of these medications have been demonstrated in published clinical studies to change primary or secondary progression in MS.

List of official treatment recommendations in brief

Each approved medicine has been studied in clinical trials involving patients with a specific clinical form of the disease; hence, approved indications are confined to that specific clinical form.

Clinically Isolated Syndrome (CIS)

In patients with an initial demyelinating episode, three forms of non-pegylated interferon beta and glatiramer acetate were investigated. These four medications have been approved for use in CIS.

Relapsing-remitting multiple sclerosis

Glatiramer acetate, teriflunomide, dimethyl fumarate, and four kinds of interferon beta have all been approved as first-line therapies for relapsing-remitting multiple sclerosis. Second-line medications such as natalizumab, fingolimod, and alemtuzumab may also be administered in the early stages of the disease in people with severe forms of the condition.

Patient characteristics have evolved throughout time. Clinical studies were carried out in adult patients who could walk without help and had active

manifestations of the disease; this concept has evolved over time, as discussed in a later section.

Secondary progressive multiple sclerosis with relapses

Interferon beta 1b and SC interferon beta 1a are the only medicines shown in particular clinical trials to be efficacious for this kind of MS. Because of its toxicity, mitoxantrone, which was approved for secondary progressive MS with inflammatory activity, is no longer utilised.

Multiple sclerosis, both primary and secondary progressive

Since clinical trials undertaken to yet have failed to show significant benefits, no therapies for these kinds of MS have been licenced. Positive outcomes for disability progression in an ocrelizumab clinical trial involving patients with primary progressive MS may pave the way for treatment for this variety. However, we cannot draw firm conclusions just yet. In a preliminary research, the same medicine was also proven to be highly effective for relapsing-remitting MS.

Treatment requirements

Disease activity: The goal of treatment is to reduce inflammatory activity in order to prevent relapses and decrease the progression of disability. One need for using contemporary pharmacological treatments is that the disease be active. There is no universal definition of active disease, and the criteria used in major clinical trials ranged from two relapses in the previous two years (interferon beta 1b21) to one relapse in the previous year (teriflunomide22) or active MRI lesions in the previous year (dimethyl fumarate 23). According to the most recent description of MS courses, MS is deemed active when the patient has had relapses or new MRI findings in the previous year.

The ideal outcome of MS treatment is "no evidence of disease activity" (NEDA), which is defined as complete symptom control (no relapses or progression) and lack of new neuroimaging abnormalities (stabilisation of MRI lesions) [12-16].

Early Treatment: Early intervention aims to stop the progression of impairment and permanent CNS damage.Numerous clinical studies have demonstrated that early treatment has advantages over delayed treatment. Therefore, it is advised that MS patients begin treatment as soon as feasible. Additionally, research indicates that early intervention results in better outcomes and a more favourable course of the condition.

Treatment duration: Given that inflammatory activity returns after treatment discontinuation, it is advised to continue treatment for a long time.26 Adherence has been linked to treatment success, which is yet another crucial element in treatment outcomes.

Follow-up: In order to determine the efficacy and safety of a treatment, follow-up based on clinical and neuroimaging data is required. Depending on the drug type, a follow-up MRI study should be carried out 6 to 12 months following the start of treatment. According to each patient's features, follow-up MRI tests should be performed; a recent consensus document suggests doing these scans once a year. Additionally, appointments for at least two follow-up visits should be made for patients receiving long-term care.

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