

Use of corticosteroids in MS

Corticosteroids are the primary drugs prescribed to patients during a MS relapse to reduce its severity and duration.

Corticosteroids are derived from cortisone

Cortisone is a hormone which occurs naturally in the human body. The name "cortisone" is derived from cortex (outer layer), since the hormone is produced in the adrenal cortex. Cortisone is a hormone needed in case of alarm, attack or flight. Cortisone has many effects on the body including raising blood sugar levels and inhibiting metabolic processes such as digestion and muscle building, but the effect that is most useful in MS is suppression of the immune system. It has an anti-inflammatory effect. Corticosteroids are administered that are slightly different to the body's own cortisone, but have the same effect.

In the 1950s, therapeutic attempts using Adrenocorticotrophic Hormone (ACTH) were carried out on patients with MS. ACTH stimulates the body's own cortisone production in the adrenal cortex. It turned out that administering ACTH during a MS attack brought about a decisive improvement. About 25 years ago ACTH treatment (the so-called Synacthen Cure) became standard therapy for MS attacks (acute exacerbations) but it is no longer commonly used.

Cortisone and/or steroids?

All substances derived from cortisone and used for medical purposes are as a group called glucocorticosteroids, corticosteroids or steroids for short. There are different types of synthetic glucocorticosteroids, featuring distinct differences with regard to their effect and biological activity. Steroids inhibit inflammation in MS by suppressing the migration of immune cells into the brain and reducing water retention (oedema) and swelling. In addition, fewer antibodies are created by B-lymphocytes (white antibody-secreting blood cells).

Compared to natural cortisone, methylprednisolone has a 5 times greater anti-inflammatory effect that persists at least twice as long. This leads to milder and briefer attacks when they occur, but in the long term has no influence on the disease course of the patient's MS. In the 70s, instead of the ACTH cure, trials were carried out using cortisone or a related substance, namely prednisone. At that time there was no clearly discernible effect on an MS attack seen from taking cortisone or prednisone. In 1980, a study was carried out on the effect of administering intravenous high-dose methylprednisolone, which demonstrated a powerful anti-exacerbative effect. Compared with the ACTH cure it had a more rapid and enduring effectiveness¹.

The main effect of methylprednisolone consists of reducing the severity and shortening the length of attacks, as well as a slight lessening in spasticity. Methylprednisolone is therefore an excellent treatment for attacks, but not however for continuous therapy. In repeated studies, a therapeutic effect of a longer-lasting, lower oral dosage of steroids could not be confirmed.

Continual treatment with steroids is beset by the problem of considerable adverse reactions, such as muscle wasting, demineralisation of the bones (osteoporosis), as well as increasing obesity. Steroids administered over longer periods of time should only be employed for those diseases for which no better treatment exists.

For people with MS, long-term therapy with low-dosage steroids should not play a role. Up to now, only intravenous administration of methylprednisolone has been confirmed as effective in controlled studies. Most neurologists give methylprednisolone intravenously for 5 days, 500 mg a day. It can also be administered for 3 days at 1 g a day. In order to prevent another rapid flare-up of inflammatory activity during an attack, after the intravenous administration of methylprednisolone prednisone nowadays is administered in tablet form in decreasing dosages for about 2-3 weeks. A few neurologists give high dosages of methylprednisolone in tablet form as well, which also has been generally considered effective during an attack. However there are only a few controlled studies which confirm this finding.

Adverse reactions

Adverse reactions from high dosages of intravenously administered methylprednisolone are uncommon. These are usually intolerance reactions which can sometimes lead to arrhythmias (disturbances in the rhythm of the heartbeat) and, occasionally, also a clear rise in blood pressure in patients already suffering from high blood pressure. Now and then cases have been described of psychological changes and, rarely, epileptic attacks. Bone necrosis, although feared as a result of high dosages of steroids, is extremely rare.

On the whole, high-dosage methylprednisolone treatment can be considered in the relapse phase of people with MS as safe. High dosage administration of methylprednisolone should not be considered for patients with an arrhythmia, severe kidney disorders or known epilepsy.

Finally, steroids have a unspecific, slight euphoric effect. Again and again patients report feeling better after taking steroids, even though clinically no clear effect on their MS could be observed. Such patients then ask for regular steroid treatment but this is not advisable because of the danger of adverse reactions mentioned above. Psychological problems in connection with MS should not be treated with steroids but instead with drugs which have a direct effect on the brain.

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Reference

1. Dowling PC, Bosch VV, Cook SD. Possible beneficial effect of high-dose intravenous steroid therapy in acute demyelinating disease and transverse myelitis. *Neurology* 1980, 30(7 Pt 2): 33-36