High dose biotin shows promise for the treatment of progressive MS

While treatment options are currently available for relapsing MS, there are no treatments for the progressive forms of the disease. This is a significant unmet need in the MS community and one that is actively being addressed by the International Progressive MS Alliance.

A new option that is currently being tested for the treatment of progressive MS is biotin. Biotin is a vitamin that acts with other molecules to speed up a number of processes within a cell including myelin synthesis. Preliminary results of a clinical trial of a high-dose pharmaceutical-grade biotin (given at 10,000 times the recommended daily intake) were presented last year at the conference of the European Committee for Treatment and Research in MS (ECTRIMS). The investigators have now published the full results of the trial in the *Multiple Sclerosis Journal*.

In this trial, which took place in France, 154 people with progressive MS (55 people with primary progressive MS and 99 with secondary progressive MS) were either given three doses of 100mg of biotin per day or a placebo (dummy capsules) over one year. The trial was particularly interested in people with progressive MS that was not currently active, so participants had shown no disease worsening over the two years prior to beginning the study. Unusually, this clinical trial aimed to reverse disability, where participants' disability scores went down over time, rather than the usual aim in progressive MS trials of stabilising disease where symptoms do not increase.

13 of the 103 people who received the biotin showed a reversal of their disability compared to none of those given the placebo capsules. While this seems a modest number of people who showed some benefit, this is likely due to the requirement of disability to be reversed in this clinical trial. Disability needed to be reversed at nine months and confirmed at one year, either through improvements in the global disability score (the EDSS or expanded disability status scale) or on the timed 25 foot walk time (a measurement of the length of time taken to walk 25 feet which tests mobility and leg function).

Treatment with biotin also reduced the proportion of people with disability progression. The combined result of improvement in disability in some people and decreased progression in others meant that the disability scores for the group receiving biotin was considered stable over the timeframe of the study.

At the end of the trial, all participants were offered an extension phase where they were given biotin irrespective of whether they had been part of the biotin group or placebo group initially. At the end of the second year, 19 of 133 people had reduced their disability related to their MS. This included 10 of the 13 people who had responded to biotin in the first year and others who had initially been on the placebo capsules.

Biotin was well tolerated, with only mild and moderate side effects reported. These included urinary tract infections and headache and were not seen to be more common in the group receiving biotin

when compared to those receiving placebo, implying these events were unrelated to the biotin medication.

Unlike current treatments for MS, it is thought that biotin acts directly on the brain and spinal cord rather than the immune system. This may be through energy production and metabolism pathways of nerve cells or myelin producing cells. Based on these promising results, further clinical trials are now planned.