Modelling disease progression in relapsing–remitting onset multiple sclerosis using multilevel models applied to longitudinal data from two natural history cohorts and one treated cohort

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Plain English summary

Predicting disease progression in patients with MS

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Plain English summary

Multiple sclerosis (MS) is a disorder of the brain and spinal cord in which presentation (initial symptoms) and progression (disability and quality of life) vary widely between individuals. There are a number of drugs that are thought to slow down disease progression, although randomised trials have only shown evidence of short-term benefit. To establish the longer-term benefit, a large cohort of patients [UK MS risk-sharing scheme (RSS)] was followed up over 10 years after treatment with four different products. Here, we developed a model for natural history of MS by modelling patterns of disability change with age in two groups of people with MS who were not treated with these drugs (one group from Wales, UK, and one from British Columbia, Canada). We used the Expanded Disability Status Scale (EDSS) to measure disability, which ranges from 0 (no disability) to 10 (death from MS). We showed that the model from one group could be used to predict disability in the other group with reasonable accuracy. We then used this natural history model to predict disability in people whose MS was treated under the UK MS RSS. The average EDSS score in the treated cohort was slightly lower than that expected if they had not been treated. This provides some evidence that treatment may be associated with a small slowing in progression of disability up to 6 years post treatment. However, this was not a randomised controlled trial, so conclusions about the efficacy or effectiveness of the treatments cannot be made.

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