Biochemical markers for identifying risk factors for disability progression in multiple sclerosis

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Background. Current therapeutic strategies for multiple sclerosis (MS), based on immune modulation, have modest efficacy in the prevention of disability.

Objective. Pathology supported genetic testing (PSGT) was used to identify risk factors for disability progression and to guide personalised intervention to improve disease outcome in MS.

Methods. Patients with MS (*N*=130) were assessed using lifestyle and diet questionnaires, as well as biochemical tests to identify markers for disability progression. Disability status was assessed using the Expanded Disability Status Scale (EDSS), ranging from 0 (no disability) to 10 (death due to MS). After following a personalised intervention programme that addressed the identified risk factors, patients were reassessed after 6 months, and again after 7 years.

Results. At baseline, 30% of patients had non-anaemic iron deficiency, 65% had raised cholesterol values (>5.0 mmol/l), and 67% had high homocysteine levels. Vitamin D deficiency (<30 ng/ml) was found in 67% and vitamin D insufficiency (<50 ng/ml) in 81% of patients. In a pilot study with personalised intervention over 6 months, 12 compliant patients showed a significant improvement of 29.9% (the mean EDSS decreased from 3.50 to 2.45). After 7 years 12 compliant patients had a mean□}standard deviation (SD) EDSS of 1.4□}0.9. All of these patients scored ≤2.5, which is regarded as benign MS. Clinical improvement correlated with normalisation of blood parameters. Control subjects (*n*=12) who were not compliant, had a mean□}SD EDSS of 8.4□}1.5 after 7 years (difference significant, *p*<0.0001).

Conclusion. Identifying risk factors for disability progression in MS using a PSGT personalised intervention programme is an effective strategy for sustained clinical improvement, and an affordable health option.