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MULTIPLE SCLEROSIS

Bigger brains resist disability in MS

> "the amount of brain you start with also matters"

A larger brain protects against disability in multiple sclerosis (MS), according to a recent study published in *Neurology*. The findings extend the brain reserve hypothesis to physical function, and could inform treatment decisions and trial design.

Maximal lifetime brain growth (MLBG) — estimated by measuring intracranial volume — is genetically determined and is fixed during adolescence. Greater MLBG is thought to produce more robust neural networks, additional plasticity and, consequently, higher brain reserve.

Lara Crow/NPG

Over 5 years, disability worsened more in patients with smaller brains

"The brain reserve hypothesis states that people with larger brain growth during development are better able to withstand ageing or neurological disease," says James Sumowski, lead author of the new study. Previous work by Sumowski and colleagues has shown that brain reserve does indeed protect against cognitive impairment. "We sought to apply this concept to the realm of physical function for the first time," says Sumowski.

The researchers estimated MLBG in 52 Serbian patients with MS who were not receiving disease-modifying therapy, and assessed their disability with the Expanded Disability Status Scale (EDSS) at baseline and after a 5-year follow-up period. Over the 5 years, disability progressed in 29 patients. EDSS scores increased more in patients with lower MLBG, and lower MLBG was associated with a higher risk of disability progression, independent of brain atrophy and lesion volume.

"We already knew that worse brain atrophy increases the risk of physical disability, so the amount of brain you lose matters," says Sumowski. "Now, we show for the first time that the amount of brain you start with also matters."

Sumowski says that the findings now need to be replicated in larger cohorts of patients receiving disease-modifying therapy. "Then we can evaluate how consideration of brain reserve can inform clinical decision-making and improve disability outcomes. Eventually, differential risk algorithms that incorporate intracranial volume might inform clinical trials, as patients may be stratified by baseline risk for disability," he concludes.

Ian Fyfe

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