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Effect of high-efficacy therapy on the course of disability in paediatric-onset multiple sclerosis

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Introduction:

High-efficacy disease-modifying therapies have been proven effective in reducing disability accumulation in patients with multiple sclerosis (MS). Whether they modify the patterns of transition among disability states in paediatric-onset MS is unknown.

Objectives/Aims:

We aimed to evaluate the effect of high-efficacy therapy on disability transitions across five states ranging from negligible disability to significant impairment of gait and secondary progressive MS in patients with paediatric-onset MS.

Methods:

Longitudinal clinical data were obtained from the international MSBase registry and the Italian MS Register. The primary outcome was defined as the time to change in disability state: negligible disability (EDSS 0-1.5), minimal disability (EDSS 2.0-2.5), moderate disability (EDSS 3.0-3.5), gait impairment (EDSS ≥4.0), and clinician diagnosed secondary progressive MS. A multi-state Markov model was constructed to simulate the natural course of MS by modelling both disability worsening and improvement simultaneously.

Results:

A total of 5499 patients were included in the analyses. Frequent relapses increased the likelihood of disability worsening, including a high risk of a 3-step transition from negligible disability to gait impairment (HR 4.87 [95% CI: 3.78, 6.27]). A higher annualised relapse rate also conferred a greater likelihood of disability improvement from gait impairment to moderate (1.76 [1.19, 2.60]) and minimal (2.81 [1.62, 4.87]) disability. The effect of high-efficacy therapy on reducing the risk of disability worsening was highest (0.49 [0.37, 0.63]) in children who were treated while in the negligible disability state, which gradually decreased later in the disease course.

Conclusion:

Despite a high chance of recovery from relapses in paediatric-onset MS, our findings suggest that frequent relapses accelerate disability worsening. Treatment with high-efficacy therapy, even when the disability is negligible, substantially reduces the chance of further disability worsening.

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