

***Assessment of physical therapy and activity in multiple sclerosis (APTAIMS): development, reliability and validity of a new questionnaire***

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**Background:** Gait impairment is a clinical hallmark of Multiple Sclerosis (MS) progression and one great concern for people with MS (pwMS). Evidence suggest that pwMS may benefit from physical activity (PA) and physical therapy (PT). To our knowledge, no objective instrument allows the measure of the efficacy of both interventions in clinical routine or trials.

**Aims:** To create and validate the APTAIMS: a scale Assessing Physical Therapy and Activity In ambulatory pwMS.

**Methods:** The APTAIMS is a self-reported measure evaluating objective and subjective components of PT and PA (e.g. frequency, contents and length of PT or PA sessions, pwMS' feeling of being well coached by their physiotherapist). **(1)** To assess its reproducibility over time, the APTAIMS was completed twice by 27 pwMS (EDSS: 3.5-4.0) at Day 0 and Day 21 (*APTAIMS T 1* and *T 2*, respectively). **(2)** Then, the questionnaire was completed by their physiotherapist (*APTAIMS T 3*) and by a neutral rater (A. G., *APTAIMS T 4*) in order to evaluate inter-rater reliability. **(3)** When filling in the *APTAIMS T 1*, pwMS completed other questionnaires assessing quality of life (QoL), self-reported health, fatigue, walking capacity, anxiety and depression). **(4)** Objective gait parameters measures were obtained by observing patients performing walking tests in an environment designed to measure gait features (GAIMS, Gait Analysis In Multiple Sclerosis). These variables were correlated with the *APTAIMS 1* to test for its convergent validity, assuming PA and PT had a positive and measurable effect on gait.

**Results:** **(1)** We observed a good reproducibility of the questionnaire over time (*APTAIMS T 1-T 2*) and **(2)** a good inter-rater reliability (*APTAIMS T 1-T 3-T 4*). **(3)** A positive perception of the quality of PT was associated with a significant decrease in fatigue ( $p=.008$ ), anxiety and depression ( $p=.024$ ). **(4)** Positive and significant relationships were observed between, on one hand, the evaluation of PT and PA performed by the patient and, on the other hand, the QoL and gait parameters (e.g. walking speed, deviation from the followed path –  $p<.05$ ).

**Conclusions:** This study describes the creation and first validation step of a scale aimed at evaluating PT and PA in pwMS. Our results suggest that the APTAIMS is reliable and valid. Quality of PT may affect patients' QoL as well as their mental and physical health. These findings need to be replicated with a larger sample with a prospective design.