

Poster presentation

## The paced auditory serial addition test in multiple sclerosis patients: the effect of brain atrophy and T1 lesion load

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### Background

The Paced Auditory Serial Addition Test (PASAT) is being increasingly used as a psychometric tool particularly as a part of the Multiple Sclerosis Functional Composite Measure. Previous studies reported the relationship between T2 lesion load on brain MRI and PASAT scores. The effect, however, of T1 hypointense lesions, which are thought to reflect destructive aspects of the disease process, and brain atrophy remains unexplored.

To investigate the relationship between PASAT performance and T1 lesion load (T1LL) as well as brain atrophy indices

### Materials and methods

Twenty-three MS patients aged  $35 \pm 13$  years ( $x \pm SD$ ) with a disease duration of  $6.13 \pm 4$  years and an EDSS score of  $2.84 \pm 1.9$  points entered the study. Patients were suffering from secondary progressive ( $n = 5$ ), primary progressive ( $n = 1$ ) and relapsing-remitting ( $n = 17$ ) MS. The PASAT scores on the 3 sec subtest were used for the present analysis. T1 and T2 lesions were automatically segmented using an edge-finding tool and total lesion areas were then calculated. MRI measures of brain atrophy included third ventricle width (THIRD VW) and the ratio of mid-sagittal corpus callosum area to the mid-sagittal intracranial skull surface area (CC/MISS). Statistical analysis was performed using multiple stepwise regression.

### Results

The optimal equation for fitting the data was PASAT score =  $26.178 - 1.746 * [T1LL] + 0.03663 * [3rd VW] +$

$250.11CC/MISS$ . This model accounted for 33.38% of the variance ( $p < 0.05$ ). Multicollinearity was not significant as the x variables were quite independent from each other (maximum  $R^2 = 0.46$ ).

### Discussion

Information processing speed, as assessed by PASAT, is affected by T1 hypointense lesion load as well as brain atrophy.