

Introducing Multiple Screener: an unsupervised digital screening tool for cognitive deficits in MS

Annual Meeting Mobile Application title: A digital screening tool for cognitive deficits in MS

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ABSTRACT

BACKGROUND Cognitive deficits affect up to 70% of all patients with MS and have a significant impact on quality of life. Cognitive assessments need to be performed by a neuropsychologist and are often time-consuming, hampering timely identification and adequate monitoring of cognitive decline in MS.

OBJECTIVE To develop a time-efficient, unsupervised, digital tool to screen for cognitive deficits in MS.

METHODS A digital (adjusted) version of the Brief International Cognitive Assessment for MS, including the Symbol Digit Modalities Test (SDMT, information processing speed), the California Verbal Learning Test (CVLT-II, verbal memory) and the Spatial Recall Test (SPART, visuospatial memory) was developed: Multiple Screener (intellectual property of Sanofi Genzyme).

Firstly, the clarity and feasibility of the tool was confirmed by 16 patients with MS (mean age 50.9 years (SD 9.4, range 37-68)). Next, in 60 healthy controls (HCs, mean age 44.5 years (SD 14.0, range 18-67)), intraclass correlation coefficients (ICC) were calculated to describe how strongly the digital version resembled the paper and pencil-based assessment. Finally, 236 HCs (mean age 42.8 years (SD 12.8, range 18-69)) were included to obtain norm scores for each test.

RESULTS ICCs between digital and paper and pencil-based assessment were excellent to good (SDMT (ICC 0.79, confidence interval (CI) 0.67-0.87); CVLT-II (ICC 0.77, CI 0.64-0.85); SPART (ICC 0.61, CI 0.42-0.75)). For each test, a regression-

based correction for the effect of age was applied on the raw scores before converting them to norm Z-scores. Additionally, the SDMT scores needed correction for education and the CVLT-II for education and sex (subgroups were created).

CONCLUSION Performance on an adjusted, digital version of the BICAMS correlates highly with the standard paper-and-pencil based test scores in HCs. Multiple Screener is an unsupervised, digital tool, with available norm scores, ultimately allowing for easy monitoring of cognitive decline in patients with MS.