

Supervised, self-administered tablet-based cognitive assessment in neurodegenerative disorders and stroke

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Background

As the population ages, the prevalence of cognitive impairment is expanding in the context of the increase of a wide array of neurological diseases. Given the recent global pandemic, there is increasing need for accurate and reliable remote testing modalities to identify and characterize cognitive deficits in individuals with neurological disorders. Self-administered, remote, tablet-based cognitive assessments would be efficient, inexpensive, and clinically valuable if they are shown to detect and classify cognitive deficits as effectively as traditional inperson neuropsychological testing.

Methods

We tested whether the tablet-based modules of the Miro application sensitively measure the same cognitive domains as traditional pencil-and-paper neuropsychological tests. Seventy-nine patients were recruited from the Stroke and Cognitive Disorders Clinic and then randomized to either undergo pencil-and-paper or tablet testing first. Twenty-nine age-matched healthy controls were administered the tablet-based assessments. We identified Pearson correlations between Miro tablet-based tests and corresponding neuropsychological tests in patients and compared scores of patients with neurological disorders with those of healthy controls using t-tests.

Results

Statistically significant Pearson correlations between the neuropsychological tests and their tablet equivalents were found for all domains with moderate ($r > 0.3$) or strong ($r > 0.7$) correlations in 16 of 17 tests ($p < 0.05$). All subtests of the tablet-based application differentiated healthy controls from patients by t-tests except for the Spatial Span Forward and Finger Tapping modules.

Conclusions

The Miro tablet-based application provides an efficient instrument to effectively detect and characterize cognitive impairments in an economical user-friendly experience.