THE MEMORY AND ATTENTION TEST (MAT): EVALUATION IN DEMENTIA, MILD COGNITIVE IMPAIRMENT AND CONTROL SUBJECTS

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Background

We developed the Memory and Attention Test (MAT), an adaptive, computer-based performance test for early recognition and treatment evaluation in dementia (cf. the respective poster in this poster session). In the evaluation of the MAT, which is currently underway, we are mainly concerned with three aspects: (1) The acceptance of this method of computerized testing in elderly people. (2) The correlation of the results of the MAT subtests with respective reference methods. (3) The differentiation of patients with Alzheimer’s dementia (AD) and patients with mild cognitive impairment (MCI) from control subjects.

Acceptance for computerized testing

Acceptance for computerized testing in this group of elderly persons was surprisingly high. In the diagram, the percentage of subjects, who agreed to the respective statement, is given. Nearly all subjects could hear and see everything well, had no problem with the computer keys and felt at ease during the testing procedure. The number of subjects, who agreed with the statement “I always knew what I was expected to do.” was a bit lower (84%). However, this may in part be attributed to the fact that 17 of the 32 subjects tested were suffering from mild cognitive impairment or dementia. More than half of the subjects said that they would prefer the computerized testing to being tested by a person. Some gave as reasons that the computerized testing was experienced as “clear”, “unequivocal” and “less embarrassing” as being tested by a person. Particularly the reduction of social distress in the testing situation was appreciated.

The high acceptance for the MAT testing procedure did not correlate with a broad technical experience of the subjects. The percentage of the subjects, who declared that they were “familiar” with the respective device or technique is given in dark blue, the percentage of those, who had “some experience” in light blue. The majority of the subjects declared that they were not familiar with most of the devices or techniques we asked for. A majority was familiar only with the use of bancomat and pocket calculator.

The oldest subject tested, a 93-year-old lady, had no experience with any of the devices or techniques we asked for, but was fully satisfied with the computerized testing and would it even prefer to be tested by a person.

Methods and Subjects

A preliminary analysis for the MAT subtests “Episodic working memory” (EWM) and “Episodic short-term memory” (ESTM) was carried out in a mixed group of 32 subjects, 10 men and 22 women, at ages between 61 and 93 years (mean ± SD: 77.1 ± 6.0 years). Their Mini Mental State scores ranged from 12 to 30 (mean ± SD: 27.8 ± 3.2). Of these 32 subjects, 7 fulfilled ICD-10 criteria of mild-to-moderate Alzheimer’s dementia (AD); 10 had a mild cognitive impairment (MCI) and 15 showed no cognitive impairment (CONTROLS).

Correlation with reference method

For the episodic memory domain, we chose the subtest “logical memory” of the Wechsler Memory Scale (WMS-LM) as reference. This subtest comprises the immediate and delayed reproduction of a history, which has been read to the subjects. There is a substantial similarity to the subtests EWM (episodic working memory) and ESTM (episodic short-term memory) of the MAT. The respective correlations between WMS-LM and MAT were found significant, for immediate reproduction and EWM (Pearson’s r = 0.373; p = 0.035) and for delayed reproduction and ESTM (Person’s r = 0.509; p = 0.003).

Differentiation of patient groups

Group differentiation was achieved to a comparable degree by both MAT subtests studied, the EWM on episodic working memory (df=2; F=6,514; p=0,005) and the ESTM on episodic short-term memory (df=2; F=7,709; p=0,002). However, EWM did better in differentiating the controls from the MCI or AD subjects, whereas ESTM better differentiated between AD subjects and the other ones.