

Abstract

The concept of memory binding appears to be auspicious for identification of subtle memory decline in early stages of Alzheimer's disease (AD). Visual Short-Term Memory Binding Test (VSTMBT) is an experimental test of short-term visual memory binding, it assesses the binding condition (shape+colour) along with the control condition of short-term memory (shape only). Although the results of the current studies seem promising, a number of limitations are present (different versions of the test, small sample size, familial vs. sporadic form of AD, etc.). In this thesis, the VSTMBT was administered to a comprehensively defined sample of people without dementia from the Czech Brain Aging Study (N=161). When comparing the groups using analysis of variance with subsequent post hoc tests, it was found that the group with amnesic mild cognitive impairment (aMCI, n=56) performed the lowest compared to the group with subjective cognitive decline (SCD, n=60) and to the cognitively normal volunteers (CN, n=45). When controlling for the effect of age and gender, these differences persisted (aMCI < KN; aMCI < SCD) in the memory binding condition (for the two-item version). The performance of the SCD group did not differ from the KN. In the subset of patients with available biomarkers, performances were compared between the groups with high probability of AD (aMCI-AD, SCD-AD) and groups unlikely AD (aMCI-nonAD, SCD-nonAD), but the Mann-Whitney U test did not reveal any differences between them. Overall, these results suggest that memory binding testing using the VSTMBT has the potential to differentiate memory decline at the level of aMCI. However, according to the preliminary results, it does not seem that the impairment of visual short-term memory is specific to the memory deficit of AD etiology.

Key words: Alzheimer's disease; computerized memory assessment; memory binding; mild cognitive impairment; subjective cognitive decline