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False Recognition Correlates with Amyloid-β_{1-42} but not with Total Tau in Cerebrospinal Fluid of Patients with Dementia and Mild Cognitive Impairment

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Abstract. Severe memory impairment forms the core symptom of Alzheimer's disease (AD), which is present early in the disease course. Recent studies show that AD patients not only suffer from forgetfulness, but also differ in their response bias, when having to decide whether information has been perceived recently, or whether it is only familiar or semantically related to perceived information. Changes in total tau-protein and amyloid-β (Aβ)$_{1-42}$ concentration in cerebrospinal fluid are also features of AD, and they predict conversion from mild cognitive impairment to dementia. In this study we correlated recognition scores with total tau and Aβ_{1-42} concentrations in patients with suggested dementia. We studied 40 patients and 21 healthy controls, using an incidental recognition memory task and a neuropsychological test battery. False recognition scores correlated with delayed recall and with Aβ_{1-42}, and Aβ_{1-42} tended to correlate with delayed recall. Total tau, however, did not correlate with memory scores or with neuropsychological performance in general. We suggest that Aβ_{1-42} may indicate a reduction in the specificity of the neuronal response in the limbic cortex, due to agglomeration of plaques. This process might be more specific for AD than the increase of tau, and therefore it is stronger correlated with recognition errors.

Keywords: Amyloid-β_{1-42}, dementia, false recognition, memory, total tau

INTRODUCTION

Alzheimer's disease (AD) is the most common type of dementia and the risk of AD is rising, due to increasing life expectancy. The earliest and core symptom of AD is an episodic memory deficit, which starts to aggravate during the preclinical period [1], and is accompanied by increasingly severe disturbances in language, attention, executive functions, and mood in later phases of the disease [2,3]. More specifically, AD is characterized by impairment in delayed recall, and several studies have shown that this impairment is a sensitive and partly specific feature for patients converting from mild cognitive impairment to AD [4–7]. Therefore, neuropsychological assessment of AD in an early phase crucially depends on learning tests and on recall of to-be-learned information after a delay or following interfering information [8–10].

Recently, it has been argued that a bias to accept seemingly familiar information as actually perceived or learned might be another specific feature of the memory impairment in AD. Typically, AD patients tend to produce more false positives on recognition tests as controls, especially in response to pictures showing high frequent and meaningful objects [11–15]. They seem

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