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SOMAscan-based proteomic measurements of plasma brain natriuretic peptide are decreased in mild cognitive impairment and in Alzheimer's dementia patients

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Abstract

Alzheimer's disease represents the most common age-related neurodegenerative disorder and a leading cause of progressive cognitive impairment. Predicting cognitive decline is challenging but would be invaluable in an increasingly aging population which also experiences a rising cardiovascular risk. In order to examine whether plasma measurements of one of the established biomarkers of heart failure, brain natriuretic peptide (BNP), reflect a decline in cognitive function, associated with Alzheimer's disease neurodegeneration, BNP levels were analysed, by using a novel assay called a SOMAscan, in 1. cognitively healthy, control subjects; 2. subjects with mild cognitive impairment, and 3. subjects with Alzheimer's disease. The results of our study show that the levels of the BNP were significantly different between the three types of diagnoses ($p < 0.05$), whereby subjects with mild cognitive impairment had the lowest mean BNP value, and healthy subjects had the highest BNP value. Importantly, our results show that the levels of the BNP are influenced by the presence of at least one *APOE4* allele in the healthy ($p < 0.05$) and in the Alzheimer's disease groups of subjects ($p < 0.1$). As the levels of the BNP appear to be independent of the *APOE4* genotype in subjects with mild cognitive impairment, the results of our study support inclusion of measurements of plasma levels of the BNP in the list of the core Alzheimer's disease biomarkers for identification of the mild cognitive impairment group of patients. In addition, the results of our study warrant further investigations into molecular links between Alzheimer's disease-type cognitive decline and cardiovascular disorders.