Short Commentary

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BDNF Serum Levels in Alzheimer's Disease and Mild Cognitive Impairment

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Keywords: Mild cognitive impairment; BDNF serum levels; Alzheimer's disease

Introduction

The mild cognitive impairment (MCI) group had higher brain-derived neurotrophic factor (BDNF) levels as compared to the Alzheimer's disease (AD) group, according to a study published by Journal of Psychiatry. Hyun Kim and Kang Joon Lee, Inje University Ilsanpaik Hospital, Goyang, South Korea, examined the differences in the serum BDNF levels in patients with Alzheimer's disease (AD) and mild cognitive impairment (MCI) and normal controls. BDNF represents a potential neuroprotective agent useful in preventing neurodegeneration, as clearly demonstrated in animal models. In humans, however, the association of BDNF serum levels with the rate of cognitive decline is still unclear [1,2].

The researchers enrolled 56 subjects with AD, 29 subjects with MCI, and 24 healthy control subjects from the psychiatric department between October 3013 and September 2014. A dementia screening test was performed using the Korean version of the Mini-Mental State Examination (MMSE-K), and the Clinical Dementia Ratings scale (CDR). Serum levels of BDNF were measured using an enzyme linked immunosorbent assay (ELISA) kit according to the manufacturer's instructions.

Clinical and demographic data of the AD, MCI, and control groups are shown in Table 1. The MCI group had higher BDNF levels as compared to the AD group (Figure 1). However, there were no significant differences between either the AD group or the MCI group, and the control group. These findings are similar to previous data in humans showing increased BDNF serum levels in preclinical stages of Alzheimer's disease [3]. Another study showed significantly increased BDNF serum concentrations in patients with MCI compared to healthy controls [4].

The increase in BDNF may reflect a compensatory repair mechanism in early neurodegeneration and could also be neuroprotective by contributing to the degradation of beta-amyloid. A positive correlation was observed between MMSE-K score and serum BDNF level (Figure 2). This study supports the hypothesis of an upregulation of BDNF in preclinical stages. There is a limitation to this study. It had a relatively small study population and was cross-sectional in design.

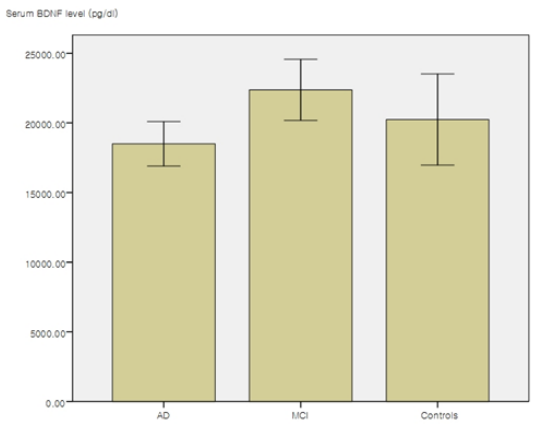

Figure 1: Brain-derived neurotrophic factor (BDNF) serum levels in Alzheimer's disease group (AD), mild cognitive impairment group (MCI), and healthy control group (Controls). Standard deviation indicated by error bars. AD, Alzheimer's disease; MCI, mild cognitive impairment; *Values are presented in pg/dl.

Table 1: Demographics and clinical parameters of AD, MCI, and control groups; Data are the mean ± standard deviation. AD, Alzheimer disease; MCI, mild cognitive impairment; MMSE, Mini-Mental State Examination; CDR, Clinical Dementia Rating.

Variables	AD group (N=56)	MCI group (N=29)	Control group (N=24)
Gender (M/F)	19/37	5/24	10/14
Age (mean ± SD) (years)	77.21 ± 6.76	73.66 ± 6.82	70.54 ± 5.83
Education (mean ± SD) (years)	6.41 ± 3.87	6.41 ± 3.94	9.25 ± 3.83
MMSE-K score (mean ± SD)	15.38 ± 5.49	24.55 ± 2.01	26.96 ± 1.60

CDR score (mean ± SD)	1.12 ± 0.71	0.50 ± 0.13	0.15 ± 0.23

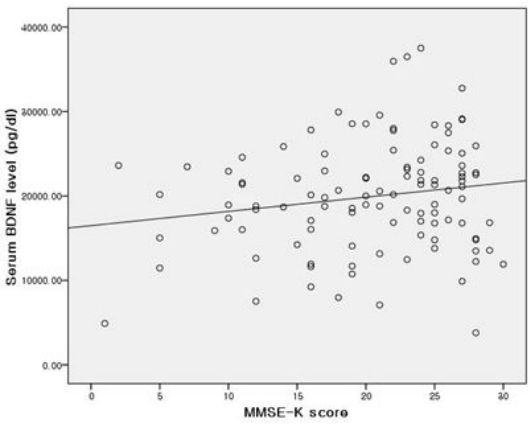

Figure 2: Correlation between BDNF serum concentration and MMSE score (r=0.172, n=109, p=0.037, 1-tailed); Pearson's correlation analyses.

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