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**Serum amino acid profiling in elderly patients with dementia syndromes
compared to elderly patients without cognitive impairment**

SUMMARY

Neurodegenerative disorders such as dementia are one of the greatest global challenges for health care in the twenty-first century. The main risk factor of dementia is old age. Due to significant changes in the worldwide demographic structure, the prevalence of neurodegenerative disorders is increasing dramatically with aging populations.

The currently used methods for early diagnosis of neurodegenerative disorders have numerous limitations. Determination of cerebrospinal fluid biomarkers is served by a invasive, complex sample preparation procedure with limited diagnostic accuracy. Neuroimaging methods are expensive, time-consuming and are not readily available for use as a common screening method. Therefore, in recent years, there has been an increasing interest in the identification of new peripheral biomarkers of dementia to minimize the limitations associated with the currently used methods.

This study has been aimed to determine if plasma amino acid profile change along the continuum from healthy controls through mild cognitive impairment to dementia, and to identify possible biomarkers at the various stages of the disease process. In addition, the study focused on assessing the modifications of amino acids that characterize the initial stages of dementia to help our understanding of the complex and multifactorial pathogenesis of neurodegenerative disorders.

A total of 123 participants were divided into four groups: healthy elderly subjects, patients with mild cognitive impairment, patients with mild dementia and patients with

moderate dementia. Serum levels of 16 amino acids were determined by high-performance liquid chromatography (HPLC) with fluorescence detection using AccQ Tag column (Waters). The results of this study indicate that the serum levels of three amino acids were changed significantly in patients with dementia, in relation to the healthy control group. In particular, we observed differences in concentrations for arginine, serine and isoleucine. All of them were significantly increased in patients with dementia, compared with the healthy subjects.

These findings suggest that the metabolisms of some amino acids seem be changed in patients with dementia. Furthermore, these results indicate that amino acid profiling might be helpful for the better understanding of biochemical and metabolic changes related to the pathogenesis and progression of dementia.

Keywords: dementia, neurodegenerative disorders, amino acids, metabolomic profiling, biomarker

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