

Dentritic, Spinal and Mitochondrial Alternations in Alzheimer's Disease. A Preliminary Descriptive Study

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Abstract

Alzheimer's disease (AD) is a devastating neurodegenerative disorder characterized by cognitive impairment, affecting memory and associated with behavioral and mood changes. The pathophysiology of Alzheimer's disease involves a number of cellular and biochemical mechanisms.

In the present study we aimed to describe the morphological alterations of dendrites, dendritic spines, synapses and mitochondria in Alzheimer's disease. For the purpose of the study we examined different brain areas in twenty brains from Alzheimer's disease patients, and twenty age-matched individuals who died accidentally.

We found significant loss of dendritic branches and decrease of spinal density, changes of the synapses and severe alterations of the mitochondria.

The findings of the present study constitute the pathological background for the cognitive decline seen in Alzheimer's disease, and are in favour of a significant role of mitochondria in early stages of the pathogenesis of the disease.

Keywords: Alzheimer's disease, dendritic pathology, morphological alterations, mitochondria, oxidative stress

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Introduction

Alzheimer's disease (AD) is a devastating neurodegenerative disorder characterized by cognitive impairment, affecting memory and associated with behavioral and mood changes. The pathophysiology of Alzheimer's disease involves a number of cellular and biochemical mechanisms [1].

The neuropathological hallmarks of the disease are the neurofibrillary tangles and senile plaques [2, 3], however a severe neuronal loss [4,5], marked synaptic and