OXIDATIVE STRESS IN MILD COGNITIVE IMPAIRMENT, A SIGNAL FOR ALZHEIMER DISEASE?

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Introduction: Mild cognitive impairment (MCI) is a transitional stage between normal cognitive aging and mild dementia or clinically probable Alzheimer’s disease (AD). There is a great interest in the relationship between MCI and the progression to Alzheimer’s disease.

The aim of this study was to determine the oxidative stress status in MCI and AD patients.

Methods: Mini-Mental State Examination and Alzheimer's Disease Assessment Scale - Cognitive (ADAS-Cog) were used. AD patients fulfilled the NINCDS ADRDA criteria, whereas MCI diagnosis followed the criteria of Petersen. We assessed the levels of some enzymatic antioxidant defences like superoxid dismutase and glutathione peroxidase, as well as lipid oxidation makers like malondialdehyde (MDA). The results were compared to an aged-matched control group.

Results: Alterations in the activity of the antioxidant enzymes were found in MCI and AD peripheral blood compared to age-matched controls. Also, MDA levels were significantly increased in the AD and MCI patients, comparative with the control group. Moreover, a similar decrease of the main enzymatic antioxidant defenses was observed in MCI and AD patients.

Conclusion: It seems that increased production of oxygen reactive species in MCI might lead to rapid consumption of plasma antioxidants. As depleted, the antioxidant systems fail to protect the organism against the oxidative damage. So, in a vicious cycle, MCI and subsequently AD individuals may have an inadequate antioxidant enzymatic activity that is incapable of responding to increased free radical production, which could lead to the development of the pathological alterations that characterize the neurodegenerative disorders.