BIOMOLECULE DAMAGE IN MOTOR NEURON IN CULTURE DURING NEURODEGENERATIVE AND OXIDATIVE CONDITIONS

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Due to the high metabolic rate and low cell regeneration capacity compared to other organs, the brain is particularly sensitive to the presence of free radicals (ROS). In the case of neurodegenerative diseases such as Alzheimer Disease, it's reported a higher rate of damage caused by ROS. The literature reports that the αβ-amyloid neurotoxicity decreases in the presence of antioxidants as well as the formation of ROS and consequently cellular damages.

The aim of this study is to understand the magnitude of damage in biomolecules from motor neuron in culture under oxidative or neurodegenerative conditions, and the possible relation between these conditions. In this work mouse motor neuron cells were subjected to a neurodegenerative condition using αβ-amyloid oligomers (50 nmol.L⁻¹), and oxidative stress employing hydrogen peroxide (500 µmol.L⁻¹). Treatments were performed at 24 and 48 hours and the damage to lipids and proteins were analyzed.

Cells treated with αβ-amyloid oligomers showed increased in both lipid peroxidation and protein oxidation compared to the control. Cells treated with hydrogen peroxide exhibited a significant increase in protein oxidation during the first 24 h of treatment, while the increasing in lipid peroxidation was observed only after 48 hours. These results indicate that the cellular response in a neurodegenerative condition is faster when compared to the condition of oxidative stress.

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