

The examination of the effects of Beta Amyloid on cultured primary cortical neurons

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Background:

Amyloid plaques that has amyloid beta peptide as a core component, are one of the major pathological hallmarks of Alzheimer's disease. Induction of oxidative stress by amyloid plaques has been reported. On the other hand, the levels of inducible nitric oxide synthase (iNOS) shown to be elevated by oxidative stress (1,2,3). In this study our aim was to determine the effects of beta amyloid 1-42 treatment on iNOS expression in primary cortical neuron cultures.

Methods:

Cerebral cortex dissected from brains of Sprague Dawley rat embryos on the embryonic day 16 and cultured. The groups including 48 hours of beta amyloid 1-42 treated group and control groups were established. mRNA isolation and cDNA synthesis performed. The levels of iNOS expressions were determined by qRT-PCR. Localization of iNOS was identified by immunofluorescent labeling.

Results:

Amount of neural processes in beta amyloid treated groups was decreased compared to the untreated control group. Beta amyloid aggregates were observed on and around both neuron soma and neural processes. Moderate immunoreactivity of iNOS was observed in the cytoplasm and neural processes of cortical neurons. Expression of iNOS in beta amyloid 1-42 treated group was found increased when compared with control group.

Conclusions:

Relative elevation in the levels of iNOS expression by beta amyloid treatment in cortical neurons might indicate the potential role of beta amyloid to induce oxidative stress via regulation of iNOS expression.

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