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Neurotoxicity of Trace Elements and the Pathogenesis of Senile-Type Dementia

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Abstract:
Both the deficiency and the excess of trace elements can severely damage of the central nervous system. In particular, recent studies have suggested the implication of aluminum and zinc in the pathogenesis of senile-type dementia including Alzheimer's disease and vascular dementia. We investigated the neurotoxicity of aluminum on primary cultured cerebrocortical neurons and found several abnormal changes similar to those observed in Alzheimer's disease. Furthermore, we found that zinc caused the death of cultured neurons, and investigated the underlying molecular mechanism. We also found that disruption of Ca homeostasis may underlie the molecular mechanism of neurotoxicity induced by aluminum or zinc. Our results indicate the significance of trace elements in the brain function and suggest their implications in the pathogenesis of senile-type dementia, including Alzheimer's disease and vascular type dementia.

Key words: Apoptosis, Ca homeostasis, cultured neuron, Alzheimer's disease, vascular dementia

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