Features of Brain Astrocyte Damage under the Influence of L-aminoadipic Acid *in vitro* and *in vivo*

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L-aminoadipic acid (L-AA) is known to have toxic effects on astroglia. The aim of this work is to characterize the morphological changes in astrocytes *in vitro* and *in vivo* under the action of L-AA. The effect of L-AA in the concentration range 0.17–1.4 mM on the astroglia of primary dissociated cultures of the rat cortex and cerebellum, as well as upon stereotaxic administration (20 μg) into the striatum of rats, was evaluated. Concentrations of 0.35–1.4 mM L-AA caused a decrease in GFAP expression, damage and death of astrocytes, pycnosis, cytoskeleton disturbances, and activation of lysosomes (increased LAMP2 expression). When 20 μg L-AA was injected into the striatum of rats, on the second day after administration, an extensive lesion area devoid of GFAP-positive astroglia was formed. This work has shown the promise of using L-aminoadipic acid for modeling astrocytic damage accompanying neurodegenerative diseases.

Keywords: astrocytes, L-aminoadipic acid, primary culture of the cortex, primary culture of the cerebellum, intracerebral administration, striatum