

SYNAPTIC ALTERATIONS INDUCED BY PERINATAL ASPHYXIA: 2-D AND 3-D ELECTRON MICROSCOPY STUDY

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Alterations in synaptic functions have been associated with neuronal cell death following perinatal asphyxia (PA). The lack of knowledge on the mechanisms underlying this dysfunction prompted us to investigate the morphological changes in the postsynaptic densities (PSDs) induced by PA. Also, we studied the actin cytoskeleton since it is highly concentrated in PSDs and is one of the most affected structures by PA. Using two dimensional (2D) electron microscopic analyses, an increase in the F-actin staining in neostriatum of 30 days-old asphyctic rats was observed. After six months of PA, the morphological changes of PSDs were studied by means of three dimensional (3D) electron microscopic analyses of synapses stained with ethanolic phosphotungstic acid (E-PTA). This technique allowed us to observe an increment of PSD thickness dependent on the duration and severity of PA insult. These results demonstrate that synaptic dysfunction following PA might be produced by early changes in the actin organization and long-term misfolding and aggregation of proteins in the PSDs. We hypothesize that the early changes in the PSDs of the rat neostriatum might be correlated with the important modification and ubiquitization of the PSDs observed in asphyctic adult rats. Supported by PID 5784, UBACYT M407 and PICT 15001.