Induction of secretory phospholipase A2 in reactive astrocytes in response to transient focal cerebral ischemia in the rat brain.

許重義
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Abstract

Although mRNA expression of group IIA secretory phospholipase A2 (sPLA2-IIA) has been implicated in responses to injury in the CNS, information on protein expression remains unclear. In this study, we investigated temporal and spatial expression of sPLA2-IIA mRNA and immunoreactivity in transient focal cerebral ischemia induced in rats by occlusion of the middle cerebral artery. Northern blot analysis showed a biphasic increase in sPLA2-IIA mRNA expression following 60-min of ischemia-reperfusion: an early phase at 30 min and a second increase at a late phase ranging from 12 h to 14 days. In situ hybridization localized the early-phase increase in sPLA2-IIA mRNA to the affected ischemic cortex and the late-phase increase to the penumbral area. Besides sPLA2-IIA mRNA, glial fibrillary acidic protein (GFAP) and cyclo-oxygenase-2 mRNAs, but not cytosolic PLA2, also showed an increase in the penumbral area at 3 days after ischemia-reperfusion. Immunohistochemistry of sPLA2-IIA indicated positive cells in the penumbral area similar to the GFAP-positive astrocytes but different from the isolectin B4-positive microglial cells. Confocal microscopy further confirmed immunoreactivity of sPLA2-IIA in reactive astrocytes but not in microglial cells. Taken together, these results demonstrate for the first time an up-regulation of the inflammatory sPLA2-IIA in reactive astrocytes in response to cerebral ischemia-reperfusion.