

## **Stroke induces histamine accumulation and mast cell degranulation in the neonatal rat brain**

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**OBJECTIVES:** The aim of the present study was to investigate both the histamine (HA) system and mast cells after neonatal stroke, because in the brain, the number of mast cells and HA contents considerably vary during development.

**METHODS:** Seven-day-old rat pups were subjected to transient focal ischemia obtained by combining permanent middle cerebral artery (MCA), and transient common carotid artery (CCA), occlusion, that produces unilateral cortical injury in the neonatal rat brain. Coronal cryostat sections were immunolabeled with an anti-histamine rabbit antibody. Mast cell were detected with 0.01 % toluidine blue (pH 3.8). In situ hybridization of histidine decarboxylase gene transcripts was also evaluated.

**RESULTS:** This study shows that ischemia induces histamine (HA) accumulation in neurons of the neonatal brain. This HA accumulation is restricted to the infarcted regions (core and penumbra), and is observed before the occurrence of cell death. Neuronal HA accumulation is accompanied by a dramatic increased number of mast cells in pia matter tissues as well as by mast cell degranulation.

**CONCLUSIONS:** Our data suggest that blockade of histamine receptors and/or drugs targeting mast cells, could pharmacologically modulate neonatal ischemic injury, and might constitute a therapeutic approach of choice in cerebral injuries occurring in the developing brain. Our further objective is to demonstrate that similar processes may also occur in human and tissues from autopsy cases with neuropathologic diagnosis of cerebral hypoxic-ischemic infarct will be analyzed.