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## **Effect of basic fibroblast growth factor treatment on brain progenitor cells after permanent focal ischemia in rats.**

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**BACKGROUND AND PURPOSE:** Intracisternal basic fibroblast growth factor (bFGF) enhances sensorimotor recovery after focal cerebral infarction in rats. One possible mechanism is stimulation of endogenous progenitor cells in brain. We investigated the effects of intracisternal bFGF on brain progenitor cells after stroke.

**METHODS:** Proliferating brain cells were labeled with bromodeoxyuridine (BrdU) before middle cerebral artery (MCA) occlusion or sham surgery in rats. bFGF (0.5 microg) or vehicle was administered intracisternally at 24 and 48 hours after MCA occlusion, and rats were killed at 7, 14, or 21 days after stroke.

Immunohistochemistry for BrdU and neuron- or astrocyte-specific markers was used to characterize progenitor cells and their progeny in the subventricular zone and dentate gyrus of the hippocampus.

**RESULTS:** Infarct size did not differ among rats with or without bFGF treatment. MCA occlusion alone increased the number of BrdU-labeled cells in the ipsilateral subventricular zone at days 7 to 21, and there was a trend toward increased cell proliferation with bFGF treatment. In the dentate gyrus, the number of BrdU-labeled cells was increased bilaterally after MCA occlusion (peak at day 7). This increase was greater after bFGF treatment. In the subventricular zone, 30% of BrdU-labeled cells were immunopositive for the immature neuron-specific marker doublecortin at day 7, and their number declined to 2% at day 21. In the dentate gyrus, the majority of BrdU-labeled cells colabeled with doublecortin at day 7, becoming NeuN positive at day 21.

**CONCLUSIONS:** Stroke produces significant changes in progenitor cells in brain that are augmented by bFGF treatment.

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