

IGF-1 STIMULATES CELL PROLIFERATION IN A SPECIFIC AREA OF THE HYPOTHALAMIC WALL

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Neurogenesis in the adult rat hippocampal subgranular zone and the subventricular zone of the lateral ventricles has been well documented. Increasing evidence suggests that neurogenesis also occurs in the adult hypothalamus. We report that, after intracerebroventricular treatment with insulin-like growth factor I (IGF-I), cell proliferation significantly increased in both the periventricular and the parenchymal zones of the whole hypothalamus. Proliferation was particularly abundant in a distinct periventricular zone of the caudal hypothalamus. This is an overlapping zone of transition, between the cubic ciliated ependymal, dorsally located, and the tanycytic ependyma, ventrally located, where three cell layers can be found: ciliated ependyma, subependyma and underlying tanycytes. After IGF-I treatment, proliferating cells were seen in the subependyma and in the layer of tanycytes. Neurons, astrocytes, tanycytes, microglia and endothelial cells of the local vessels were stained with the proliferative marker 5-bromo-2'-deoxyuridine (BrdU) in response to IGF-I. However, we never observed BrdU-positive ciliated cubic ependymal cells. In the subependyma, proliferating glial fibrillary acidic protein-positive astrocytes contacted the ventricle by an apical process bearing a single cilium and there were many labyrinthine extensions of the periventricular basement membranes. Both features are typical of neurogenic niches in other brain zones, suggesting that the central overlapping zone of the rat hypothalamic wall could be considered a neurogenic niche in response to IGF-I. These effects will be compared with those obtained for other factors.