AGING AND CAROTID BODY

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The carotid body (CB) is a neuroepithelial tissue consisting of O_2 sensitive glomus cells that constantly scan the arterial blood for O_2 . Aging is a cumulative result of decreased O_2 supply. The appraisal was based on animal studies and human CB taken from people who died after traumatic events. We found changes in the aged chronically normoxic CB akin to the effects of chronic hypoxia-like fewer glomus cells and their synaptic contacts, secretory vesicles, and mitochondria and the enhancement of extracellular matrix. There were increases in the expression of hypoxia-inducible factor one-alpha (HIF-1a), vascular endothelial growth factor (VEGF), and nitric oxide synthase (NOS1). Both morphometric and immunohistochemical hypoxia-induced changes were less intense in the aged than young CB. We conclude that aging and hypoxia share a common background underlain by deficient O_2 tissue supply, mitochondrial dysfunction, and a limited ability to deal with increased cellular oxidative stress. Aging leads to adaptative reductions in CB responsiveness to hypoxia shifting the chemosensory threshold upward. Degenerative parenchymal changes and attenuated CB physiological functioning point to a decline in the organ’s chemosensing role in preventing tissue hypoxia by lung hyperventilation in the aged.