

# Effects of aging on nitrergic system in human basal nuclei

Efeitos do envelhecimento sobre o sistema nitrérgico dos núcleos da base em humanos

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## ABSTRACT

Nitric oxide (NO) is a gaseous molecule that plays a role in a number of physiologic processes. The available evidence suggests that NO is a major neurotransmitter involved in motor control and emotion/behavior modulation. To investigate the distribution and morphology of the nitrergic system in human basal nuclei, we studied samples from the striatum, globus pallidus, subthalamic nucleus, substantia nigra and pedunclopontine nucleus of 20 human brains from subjects without neurologic/psychiatric diseases. The samples were stained for NADPH-diaphorase using histochemistry and for neuronal NO synthase using immunohistochemistry. We then analyzed the nitrergic neuronal density and its morphometric parameters. Our data demonstrated that: (I) the most posterior regions of the striatum exhibit a higher neuronal density; (II) the limbic cortex-associated areas of the striatum exhibit higher neuronal density than other functional subdivisions; (III) approximately 90% of the neurons in the subthalamic nucleus express NO; (IV) the pedunclopontine nucleus exhibits a massive nitrergic neuronal density; (V) in the globus pallidus, there is a marked presence of NO neurons in the medial medullary lamina; and (VI) nitrergic neurons were not detected in the substantia nigra. Aging did not change the neuronal density or the morphometric parameters of nitrergic neurons in the analyzed nuclei.

**Keywords:** nitric oxide, basal nuclei, striatum, subthalamic nucleus, aging.

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