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Parkinson's disease: A disorder due to nigral glutathione deficiency? ☆

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Abstract

Amino acid analysis of autopsied human brain showed reduced glutathione (GSH) content significantly lower in the substantia nigra than in other brain regions. GSH was virtually absent in the nigra of patients with Parkinson's disease.

Oxidative degradation of L-DOPA and dopamine in vivo may generate reactive oxygen species (hydrogen peroxide, superoxide, hydroxyl radical, or singlet oxygen) which can damage membranes and other cellular components. Since GSH is an important natural antioxidant, a deficiency of GSH in the substantia nigra could make this region vulnerable to oxidative injury. If confirmed, the hypothesis that loss of nigrostriatal dopaminergic neurons results from a regional GSH deficiency could have important therapeutic implications for the management and prevention of Parkinson's disease.