

Transition metals, ferritin, glutathione, and ascorbic acid in parkinsonian brains.

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Source

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Abstract

The regional distributions of iron, copper, zinc, magnesium, and calcium in parkinsonian brains were compared with those of matched controls. In mild Parkinson's disease (PD), there were no significant differences in the content of total iron between the two groups, whereas there was a significant increase in total iron and iron (III) in substantia nigra of severely affected patients. Although marked regional distributions of iron, magnesium, and calcium were present, there were no changes in magnesium, calcium, and copper in various brain areas of PD. The most notable finding was a shift in the iron (II)/iron (III) ratio in favor of iron (III) in substantia nigra and a significant increase in the iron (III)-binding protein, ferritin. A significantly lower glutathione content was present in pooled samples of putamen, globus pallidus, substantia nigra, nucleus basalis of Meynert, amygdaloid nucleus, and frontal cortex of PD brains with severe damage to substantia nigra, whereas no significant changes were observed in clinicopathologically mild forms of PD. In all these regions, except the amygdaloid nucleus, ascorbic acid was not decreased. Reduced glutathione and the shift of the iron (II)/iron (III) ratio in favor of iron (III) suggest that these changes might contribute to pathophysiological processes underlying PD.

