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MRI Signal Intensity and Parkinsonism in Manganese-Exposed Workers.

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Abstract

OBJECTIVE: T1-weighted brain magnetic resonance imaging (MRI) of the basal ganglia provides a noninvasive measure of **manganese** (Mn) exposure, and may also represent a biomarker for clinical **neurotoxicity**.

METHODS: We acquired T1-weighted MRI scans in 27 Mn-exposed welders, 12 other Mn-exposed workers, and 29 nonexposed participants. T1-weighted intensity indices were calculated for four basal ganglia regions. Cumulative Mn exposure was estimated from work history data. Participants were examined using the Unified Parkinson's Disease Rating Scale motor subsection 3 (UPDRS3).

RESULTS: We observed a positive dose-response association between cumulative Mn exposure and the pallidal index (PI) (β=2.33; 95% confidence interval [CI], 0.93 to 3.74). There was a positive relationship between the PI and UPDRS3 (β=0.15; 95% CI, 0.03 to 0.27).

CONCLUSION: The T1-weighted pallidal signal is associated with occupational Mn exposure and severity of parkinsonism.

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