

Brain Manganese Deposition Depicted by Magnetic Resonance Imaging in a Welder

A 41-YEAR-OLD MAN sought medical assistance because of discrete memory deficit in the last 3 years. He had been working as a welder for more than 20 years and never used safety measures to avoid the toxic side effects from the welding fumes. The neuropsychological assessment confirmed a cognitive impairment characterized by attention deficit as well as short-term and long-term memory deficits as seen on the results from the Wechsler Adult Intelligence Scale—Third Revision and the Rey Auditory Verbal Learning tests. He also presented parkinsonian symptoms characterized by bradykinesia and cogwheel rigidity in his upper limbs, which was more pronounced on the right side. The patient also exhibited a slight postural and resting tremor depicted only in the right upper limb. The magnetic resonance imaging scan showed bilateral and symmetric hyperintensities within the substantia nigra, subthalamic region, and globus pallidus on spin-echo T1-weighted images (**Figure**). We obtained his serum manganese (Mn) level (1.76 µg/mL) by means of atomic absorption spectrophotometry and considered elevated those values higher than 0.85 µg/L (to convert manganese to nanomoles per liter, multiply by 18.202). After the exclusion of other causes related to Mn accumulation, we made the diagnosis of manganism secondary to the toxic side effects from welding fumes. We explained the disease and its prevention to this patient and prescribed as therapy edetic acid intravenously administered at a dose of 1 g twice daily for 10 days; however, as of this writing, he has been lost to follow-up.

COMMENT

A biologic marker of Mn accumulation within the central nervous system is a bilaterally increased T1 mag-

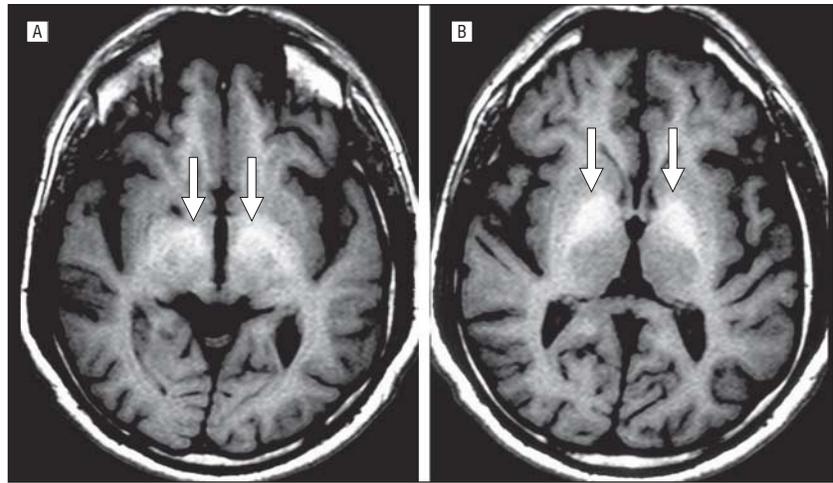


Figure. Axial T1-weighted images show bilateral and symmetric hyperintensities within the subthalamic region (A) and the globus pallidus (B) (arrows).

netic resonance imaging signal within the basal ganglia, especially the globus pallidus, but also the striatum.¹ This magnetic resonance imaging pattern has been documented in several conditions, including a recent association of Mn toxicity in patients undergoing maintenance hemodialysis.² Some authors have described the same pattern of Mn accumulation in welders, secondary to inhalation of ambient welding fumes with reported inadequate ventilation or other safety measures, who presented with parkinsonian and cognitive symptoms.^{3,4} We reinforce the importance of these safety measures to prevent Mn toxicity. Magnetic resonance imaging can demonstrate typical features in this setting, even in those patients with minimal neurological symptoms, as described here.

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