Teaching *NeuroImages*: Myelopathy due to B₁₂ deficiency in long-term colchicine treatment and nitrous oxide misuse

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Figure Spinal cord MRI

MRI with and without gadolinium disclosed on sagittal short T1 inversion recovery (STIR) series hyperintensity within the dorsal cervical and thoracic spinal cord (A). On axial series, V-shaped T2 hyperintensity was again noted within the dorsal cervical and thoracic spinal cord (B). No associated enhancement was evident on sagittal and axial series.

A 35-year-old man with colchicine-treated gout presented with 4 weeks of progressive paresthesias and wide-based gait after several months of recreational nitrous oxide (N₂O) inhalation. Examination revealed distal weakness, diminished vibration and proprioception sense, and Romberg sign. Babinski and Lhermitte signs were absent. Spinal cord MRI (figure, A and B) demonstrated dorsal column abnormalities. Serum vitamin B₁₂ level was 145 pg/mL; methylmalonic acid was 5,640 nmol/L. Intrinsic factor and parietal cell antibodies were absent. Complete blood count, folate, and CSF (including inflammatory and infectious) studies were normal. Vitamin B₁₂ is a necessary cofactor for production of S-adenosyl methionine, a compound necessary for methylation of myelin sheath phospholipids and myelin formation.¹ Colchicine impairs B₁₂ absorption while N₂O irreversibly inactivates systemic B₁₂.^{1,2}

After 3 months of colchicine and N₂O cessation with B₁₂ supplementation, his sensation and gait improved while MRI findings resolved.

AUTHOR CONTRIBUTIONS

Dr. Probasco: study concept or design, drafting/revising the manuscript, analysis or interpretation of data, acquisition of data, involved in treatment of patient. Dr. Felling: study concept or design, analysis or interpretation of data, acquisition of data, involved in treatment of patient. J.T. Carson: drafting/revising the manuscript, involved in treatment of patient. Dr. Dorsey: study concept or design, drafting/revising the manuscript, involved in treatment of patient, study supervision. Dr. Niessen: drafting/revising the manuscript, analysis or interpretation of data, acquisition of data, involved in treatment of patient.

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