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LETTER TO THE EDITOR

MRI findings in subacute combined degeneration of the spinal cord in a patient with restricted diet

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Abstract Subacute combined degeneration (SCD) is a rare cause of demyelination of the dorsal and lateral columns of the spinal cord, and is a neurogenic complication due to vitamin B_{12} deficiency, that we observe with unusual frequency. Improvement in myelopathy with normalization of the abnormalities in the MRI may occur if the replacement of the vitamin B_{12} is started early in the course of the disease. A rare case of SCD of the spinal cord due to vitamin B_{12} deficiency with a history of diet restrictions is presented.

Keywords Subacute combined degeneration (SCD) · Magnetic resonance imaging (MRI) · Spinal cord · Vitamin B_{12}

Dear Sirs,

Vitamin B_{12} deficiency can induce pathology in the brain, spinal cord, optic nerve and peripheral nerves [1–5]. The specific spinal cord lesion caused by vitamin B_{12} deficiency, a rare cause of myelopathy, is known as subacute combined degeneration (SCD) [6], is the most frequent neurological manifestation of this deficiency [5, 7].

We describe a rare case with history of vegetarianism with typical symptoms and signs of vitamin B_{12} deficiency, with involvement of the posterior and lateral columns, on the cervical cord.

A 63-year-old woman was admitted with progressive difficulty in walking for 6 years, paresthesia and weakness in lower extremities. The patient did not include meat and eggs in her diet. Without history of diabetes mellitus, alcohol addiction or gastrointestinal symptoms, she had asymmetric paraparesis, worse on the right (muscular strength 3/6 grade), hyperreflexia and increased muscle tone, particularly on the right, presenting as spasticity and ataxic gait. Loss of vibration and position sense in the lower extremities was observed. Romberg's and Babinski's sign (on the right side) were present. Laboratory tests were remarkable only for vitamin B_{12} (<60 pg/ml, reference 198–883); folic acid level was normal (11.9 ng/ml, reference 2.2–17.5). The serologic tests for intrinsic factor, HIV and Lyme were negative, and the CSF analysis was normal.

The cervical spine MRI showed hyperintensity on T2-weighted images (Figs. 1, 2, 3) within the posterior aspect of the cervical spinal cord extending from the bulbomedullary region through C4, with better evidence on the right, without expansion of the cord. Axial T2-weighted images showed hyperintensity that corresponded to the posterior and lateral columns. There was no contrast enhancement after administration of gadolinium. Brain MRI was normal.

Following clinical and laboratory examinations, the patient was evaluated as cervical myelopathy due to vitamin B_{12} deficiency, and the treatment included cyanocobalamin (1,000 μg intramuscular/day for a week and then weekly for 6 weeks), folic acid 5 mg/day and polivitaminic B. After 3 months, she was able to walk alone. Laboratory tests revealed normal values of acid folic and B_{12} vitamin. Follow-up cervical MRI (Fig. 4) 6 months later showed marked resolution of the areas of the abnormal signal intensity.

Vitamin B_{12} cobalamin can be found in food from animal and same plant sources. The effects of vitamin B_{12} deficiency may not be detected until several years later, when these stores are depleted [8].

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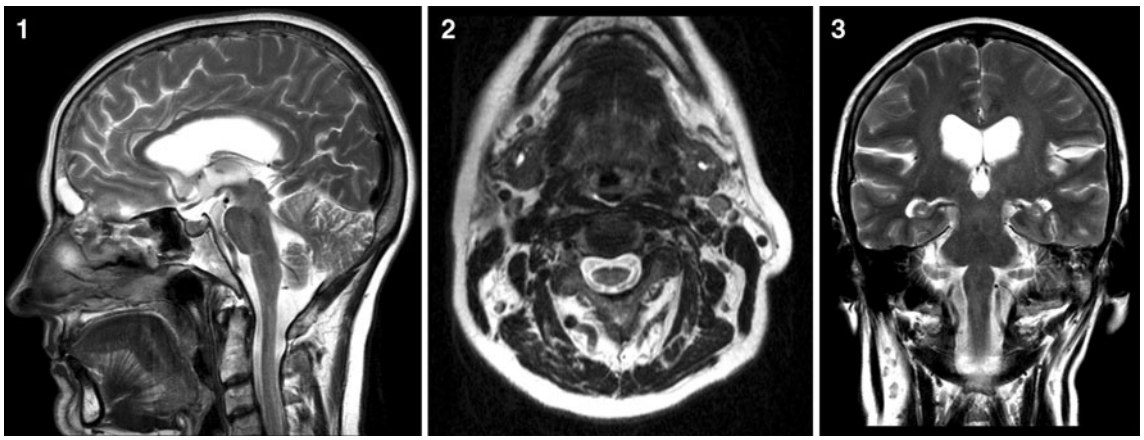

Figs. 1, 2, 3 Sagittal, axial and coronal T2-weighted MRI of the cervical spinal cord demonstrates hyperintensity in the dorsal aspect of the spinal cord

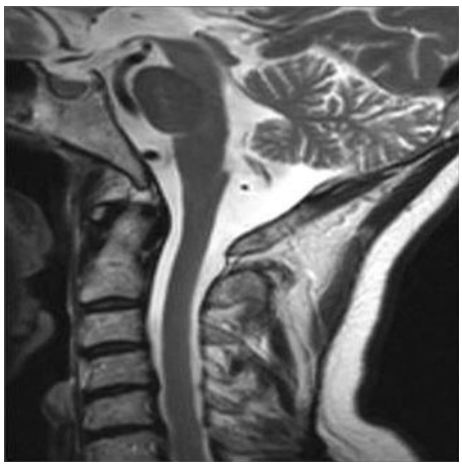

Fig. 4 Sagittal T2-weighted image obtained 6 months after therapy showed resolution of signal abnormality

The causes of vitamin B_{12} deficiency may result mainly from: inadequate intake, malabsorption and other conditions (nitrous oxide anesthesia, autoimmune disorders, etc.) [1, 3, 9].

Strict vegetarians have a well recognized high risk of vitamin B_{12} deficiency. This patient's diet was a vegetarian like diet, more precisely lacto-vegetarian diet. It has long been recognized that strict vegetarians are at risk for vitamin B_{12} deficiency, however, low intake of animal-source foods, such as occur in some lacto-ovo vegetarians and many less-industrialized countries, cause vitamin B_{12} depletion [10].

Other causes of vitamin B_{12} deficiency, such as problems with malabsorption or autoimmune disorders among others was excluded in laboratory analysis and in clinical history. Therefore, this vitamin B_{12} deficiency was attributed to inadequate intake, caused by a lacto-vegetarian diet.

It is important to distinguish from other causes of myelopathy that involve the dorsal columns of spinal cord, such as degenerative, demyelinating, infectious, inflammatory, neoplastic, nutritional and vascular disorders [1, 4, 7, 11].

Demyelination involves mainly the dorsal and lateral columns, predominantly in the lower cervical and upper thoracic region. This process eventually can extend over several segments, involving cervical and thoracic regions [1–4, 8, 11, 12].

The most consistent MR findings in SCD is increased signal intensity on T2-weighted images, primarily in the dorsal columns in the cervical and/or the thoracic portions of the spinal cord [1–6, 9, 11].

There is involvement of the anterior columns in a few advanced cases [3, 9].

Although MRI findings in these diseases are nonspecific, in conjunction with the clinical examination findings and laboratory testing, they can be helpful for both diagnosing SCD and monitoring the response to therapy. Improvement in myelopathy, and the resolution of these abnormalities in the MRI may occur if the treatment for vitamin B_{12} deficiency is started early in the course of the disease [1, 3, 12, 13].

We report a rare case of SCD due to vitamin B_{12} deficiency, associated with a history of diet restrictions, with involvement of both dorsal and lateral columns of the spinal cord. In this case an accurate clinical history is essential for making the diagnosis and appropriate management.

Conflict of interest The authors declare that they have no conflict of interest.

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