It is illegal to post this copyrighted PDF on any website. A Case of Vitamin B₁₂ Deficiency With Various Psychiatric Symptoms and Cognitive Impairment

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P revious studies¹⁻⁴ have reported that neuropsychiatric symptoms are associated with vitamin B_{12} deficiency. Disturbance of consciousness, delirium, and cognitive impairment are strongly suggestive of mental illness and organic brain disease. Therefore, clinicians may find vitamin B_{12} deficiency to be a diagnostic challenge, as illustrated in our case report.

Case Report

The patient was a married 57-year-old man with no history of mental illness. As his filial relationships were strained, he had self-managed his diet for the past 5 years, consuming only his favorite processed food bought at a convenience store with no consideration of nutritional balance. He took leave from work due to lower back pain 4 months before hospitalization.

Two months before hospitalization, he experienced numbness in his right hand and presented to the internal medicine department of hospital A, but no abnormalities were detected. About 17 days before hospitalization, he developed dysstasia, incontinence, and hallucinations. He presented to the psychiatric department of hospital B after 2 days of experiencing these symptoms and was diagnosed with depression. Since his physical symptoms persisted and psychiatric symptoms worsened, he was referred to the psychiatric outpatient department 12 days before hospitalization.

The patient's symptoms of depression were unremarkable, but dysstasia, incontinence, and hallucinations such as "seeing the form of a middle-aged man" were still present. Results of blood analysis and head computed tomography scans were almost within normal limits. His behavior became progressively erratic. Thus, he was referred and admitted to psychiatric hospital C for examination of organic diseases and

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with a suspicion of acute and transient psychotic disorder. During this time, the patient developed severe abdominal pain and melena and was transported to the emergency department of a university hospital (9 days after admission to psychiatric hospital C).

Blood tests indicated anemia and renal dysfunction. Vitamin B_1 and folic acid levels were within normal limits, but serum vitamin B_{12} levels were low at 190 pg/mL (reference range, 233–914 pg/mL). Atrophic gastritis (due to *Helicobacter pylori* infection) was detected on endoscopic examination and enteritis on abdominal computed tomography. The patient experienced auditory hallucinations and observational and persecutory delusions and was diagnosed with delirium. His Mini-Mental State Examination (MMSE)⁵ score was 9/30.

Although intramuscular injection of hydroxocobalamin is recommended by the British Society of Hematology Guidelines,⁶ we chose intravenous injection of methylcobalamin (1,000 µg) on alternate days for a week, along with the ongoing infusion, and then switched to oral administration (3,000 µg). On day 19 of hospitalization, his renal function, anemia, and delirium improved along with his general condition. However, his cognitive impairment persisted, with an MMSE score of 24/30 6 weeks after starting treatment. Therefore, he was referred and admitted to psychiatric hospital C on day 41 after admission to the university hospital to continue vitamin replacement therapy. He was discharged from psychiatric hospital C after 73 days of environmental control and rehabilitation. One year after discharge from psychiatric hospital C, his MMSE score was 30/30, he had no issues in his family life, and he planned to return to work. His vitamin B_{12} level was 1,096 pg/mL. He is currently taking methylcobalamin 3,000 µg.

Discussion

In our patient, the cause of the vitamin B_{12} deficiency was thought to be a combination of reduced dietary intake due to an imbalanced diet, malabsorption of vitamins due to atrophic gastritis, and enteritis. Vitamin B_{12} deficiency is reported to be common in older people,⁷ and the relationship between vitamin B_{12} deficiency and dementia has been reported.⁸ However, as there are several cases^{4,9} of patients presenting with a diverse range of psychiatric and neurologic symptoms during middle age, it is essential to proactively conduct tests to detect vitamin B_{12} deficiency when this condition is suspected based on the patient's diet and atrophic

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through long-term vitamin B_{12} supplementation therapy¹⁰ proves the importance of continuation of supplemental vitamin B_{12} therapy in patients with deficiency who show residual cognitive impairment, even after improvement of psychiatric symptoms.

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report, and information has been de-identified to protect anonymity.

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