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CASE REPORT

Is a decrease in activities of daily living in the elderly irreversible? A case report of Wernicke encephalopathy in home medical care

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Abstract

The patient was an 83-year-old male who, after being hospitalized for 70 days for suffocation due to aspiration, was provided with home medical care (HMC) as his physical condition did not allow him to climb stairs. Wernicke encephalopathy (WE) was suspected based on his disorientation and a continued loss of appetite. This diagnosis was supported by abnormal serum thiamine and the disappearance of delirium after thiamine administration. In addition, he became able to use stairs. Patients who receive HMC should undergo active screening and receive treatment with WE in mind.

KEYWORDS
activity of daily living, delirium, home medical care, thiamine deficiency, Wernicke encephalopathy

1 | INTRODUCTION

Thiamine, in its biologically active form thiamine pyrophosphate, is an essential coenzyme for oxidative cellular metabolism. As the physiological store of thiamine is limited, a deficiency is likely to occur if there is a loss of appetite for 2 or 3 weeks.[1] Wernicke encephalopathy (WE) is a neuropsychiatric disorder caused by thiamine deficiency. WE has often been reported in alcohol use disorder (AUD) patient populations, although there is an increasing understanding that it is often overlooked in non-AUD patients.[2] Failure to identify WE can lead to the development of Korsakoff syndrome, resulting in irreversible brain damage in a high percentage of patients.[3]

Patients receiving home medical care (HMC) show reduced levels of activities of daily living (ADLs) and often present with delirium.[4] Furthermore, a survey of the at-home elderly demonstrated

that thiamine intake was insufficient in about 60%[5]; thus, the existence of cases of delirium associated with thiamine deficiency is not surprising. However, to our knowledge, there is only one report of WE in lung cancer patients receiving HMC.[6]

Here, we report a patient receiving HMC who developed WE. Thiamine replacement therapy led to recovery and, at the same time, ADLs were significantly improved.

2 | CASE REPORT

The patient was an 83-year-old male with no noteworthy medical history who, 70 days previously, had visited an emergency hospital because of chocking on food, difficulty in breathing, and impaired consciousness. After endotracheal intubation, he was temporarily ventilated, but was later discharged as his general condition stabilized after treatment. Although there was no significant deterioration in cognitive function compared to that prior to admission based on the caregiver report, it was judged that HMC was necessary as his physical condition was significantly reduced. HMC was started on the day of discharge.

At the initial visit, the patient could respond to the doctor's questions and discuss future HMC policies. On a daily life level, the patient could eat soft meals and visit the toilet without assistance. He lived in a second-floor apartment without an elevator and could not use the stairs to attend day service. Physical examination did not reveal any breath sounds or heart murmurs, or lower leg edema. His blood pressure was 102/55 mmHg, heart rate 63 beats/min, respiratory rate 20 breaths/min, body temperature 35.3°C, and oxygen saturation 98%. An enteral nutritional supplement (ENSURE® H) was prescribed due to low dietary intake, but the patient rarely took it. On the 5th day after the initial visit, the family reported that behavioral abnormalities such as the tearing of clothing and scratching of a desk appeared, but due to the changes in his environment, it was initially decided to wait and see.

At the 2nd visit, 28 days after the initial visit, the patient appeared restless and could not answer the question "Where are we?" at the physical examination, the patient's blood pressure was 126/55 mmHg, HR 65 bpm, respiratory rate was 16 times/min, body temperature was 35.4°C, and SpO_2 was 98%. Again, no breath sounds, heart murmur, or lower leg edema were observed. A dry tongue and skin were observed. He walked using handrails installed inside the house due to weakness in the lower limbs. His psychiatric features fulfilled the criteria for delirium of the Diagnostic and Statistical Manual of Mental Disorders, 5th edition.[7] We considered the dehydration due to poor oral intake, electrolyte abnormalities, side effects of drugs, chronic subdural hematoma, etc., but we collected blood to understand the general condition and because VB1 deficiency was also taken into consideration as the cause of delirium based on the fact that a family member had reported that his oral intake had decreased to 30% of normal. Approximately 1 week after blood sampling, the patient's serum thiamine level was found to be abnormally low (Table 1).

TABLE 1 Laboratory findings

	Reference range		Values
Total protein	6.5–8.2	g/dl	7.1
Albumin	3.7–5.5	g/dl	3.4
Total bilirubin	0.3–1.2	mg/dl	0.5
BUN	8.0–20.0	mg/dl	16.0
Creatine	0.65–1.09	mg/dl	1.07
Uric acid	3.6–7.0	mg/dl	10.6
Na	135–145	mEq/L	136
Cl	98–108	mEq/L	103
K	3.5–5.0	mEq/L	5.0
C-reactive protein	0.0–0.3	mg/dl	0.37
AST	10–40	IU/L	25
ALT	5–45	IU/L	11
ALP	104–338	IU/L	274
LDH	120–245	IU/L	252
γ-GTP	0–79	U/L	104
CK	50–230	U/L	51
Amylase	39–134	U/L	133
Plasma glucose	70–109	mg/dl	101
HbA1c	4.6–6.2	%	5.0
WBC count	3500–9700	/μl	3570
RBC count	438–577	$\times 10^4$/μl	350
Hemaglobin	13.6–18.3	g/dl	11.4
Hematocrit	40.4–51.9	%	34.2
MCV	83–101	FL	98
MCH	28.2–34.7	PG	32.6
MCHC	31.8–36.4	%	33.3
Platelet count	14.0–37.9	$\times 10^4$/μl	15.39
Vitamin B1	21.3–81.9	μg/dl	19.7
TSH	0.5–5.0	μIU/ml	6.07
FT3	2.3–4.0	pg/ml	2.56
FT4	0.9–1.7	ng/ml	0.94
NT-proBNP	0–125	pg/ml	43

From 2 months after the initial visit, the patient was orally administered thiamine at 25 mg/day, and in the third month, his disorientation and abnormal behavior disappeared, ADLs were improved so that he was able to climb stairs, and it was possible for him to attend day care. Thereafter, no symptoms of delirium have been observed for more than 1 year. Nine months after the start of thiamine administration, the patient was able to visit the hospital by bus, so HMC was discontinued and the patient was transferred to the outpatient clinic.

3 | DISCUSSION

We identified a WE patient receiving HMC. With proper diagnosis and treatment, the patient recovered with no serious brain-related sequelae.

Wernicke encephalopathy was suspected based on the patient's impaired consciousness and loss of appetite. As the frequency of these symptoms is high in patients receiving HMC, differential diagnosis for thiamine deficiency will be needed in the future.

At the initial visit for HMC, the patient's ADLs were so low that he could not use the stairs. However, as the symptoms improved after the administration of thiamine, the possibility of the low ADLs being due to thiamine deficiency cannot be excluded. The symptoms of thiamine deficiency are diverse, with muscle weakness sometimes reported as the main symptom.[8] Many elderly people receiving HMC exhibit muscle weakness, but it is necessary to distinguish thiamine deficiency as the cause.

There are a number of areas for improvement with regard to diagnosis and treatment in this case. The first point is the delay in differential diagnosis after delirium appeared. The second point is that there was quite a time lag between the identification of thiamine deficiency and the administration of thiamine. In future, early administration is necessary to prevent the onset of Korsakoff syndrome. In the current case, thiamine deficiency was treated by the oral administration of thiamine; however, intravenous administration appears preferable based on the possibility of thiamine malabsorption.[9] Based on this case report, we hope that the possibility of thiamine deficiency will be considered in similar cases in the future.

4 | CONCLUSION

If a patient receiving HMC has delirium or loss of appetite, it is advisable to measure thiamine and provide thiamine therapy as necessary.

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CONFLICTS OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient for the publication of this case report. Our institution does not require approval from the institutional ethics committee for case reports.

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