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. 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. Failure to identify WE can lead to the development of Korsakoff syndrome, resulting in irreversible brain damage in a high percentage of patients.

Patients receiving home medical care (HMC) show reduced levels of activities of daily living (ADLs) and often present with delirium. Furthermore, a survey of the at-home elderly demonstrated...
that thiamine intake was insufficient in about 60%⁴; thus, the exis-
tence 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 choking on food, difficulty in breathing, and impaired
consciousness. After endotracheal intubation, he was temporarily
ventilated, but was later discharged as his general condition stabi-
lized after treatment. Although there was no significant deteriora-
tion 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 ques-
tions and discuss future HMC policies. On a daily life level, the pa-
tient 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, respira-
tory 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 behav-
ioral 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 ap-
peared 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 63 beats/min, body
temperature was 35.4°C, and SpO₂ was 98%. Again, no breath sounds, heart murmur, or lower leg edema were ob-
served. 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, elec-
trolyte abnormalities, side effects of drugs, chronic subdural
hematoma, etc., but we collected blood to understand the gen-
eral 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).

From 2 months after the initial visit, the patient was orally admin-
istered thiamine at 25 mg/day, and in the third month, his disorien-
tation 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 admin-
istration, the patient was able to visit the hospital by bus, so HMC
was discontinued and the patient was transferred to the outpatient
clinic.

| 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 x10⁶/μl   | 350      |
| Hemoglobin | 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 x10⁵/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       |
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. 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.

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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