

A Case of Wernicke Encephalopathy in a Dementia Caregiver: the Need for Nutritional Evaluation in Family Caregivers

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Case report

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【The title of the paper 】

A case of Wernicke encephalopathy in a dementia caregiver: The need for nutritional evaluation in family caregivers

【The running title】

Thiamine deficiency in a caregiver

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【Compliance with ethical standards】

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

Abstract

Background:

We report a case in which a family member caring for her mother with dementia developed Wernicke encephalopathy, which is a neuropsychiatric disorder caused by acute/subacute thiamine deficiency, during the course of care.

Case presentation:

A 63-year-old woman consulted our psychiatric outpatient clinic complaining of difficulty in providing care. She had started caring for her mother with dementia 6 months previously, during which time she began to feel tired. In addition, a loss of appetite had appeared 2 months prior to her visit, and this had decreased to about 30% of normal from 10 days previously. Neurologically, she experienced mild unsteadiness, but she was fully conscious and had no ocular symptoms. Based on the fact that the store of thiamine in the body is exhausted in about 18 days, the possibility of thiamine deficiency was considered, and her unsteadiness disappeared after an intravenous injection of thiamine. Test results showed her serum thiamine level to be abnormally low, and the patient was diagnosed with Wernicke encephalopathy.

Conclusions:

The burden of caring for a dementia patient may affect the nutritional status of the family caregiver. Thiamine deficiency should be one of the items considered as a nutritional issue in such caregivers.

【Key words】

Dementia, caregiver, thiamine deficiency, Wernicke encephalopathy

A case of Wernicke encephalopathy in a dementia caregiver: The need for nutritional evaluation in family caregivers

Background

Dementia care is often provided by family members, and the responsibility for such care mainly falls to the spouse, children, or those familiar to the patient. The provision of care is a constant stressor that causes both physical and mental stress in the family caregiver [1]. However, the nutritional status of the caregiver, particularly issues related to vitamins, has not been discussed.

Thiamine, in its biologically active form thiamine pyrophosphate, is an essential coenzyme for oxidative metabolism [2]. As the human body cannot synthesize thiamine internally, thiamine must be ingested from food. The limit of thiamine storage in the human body is only 18 days [3]. Therefore, the body can become thiamine deficient through a loss of appetite lasting for a few weeks. A continuing thiamine deficiency can lead to the neuropsychiatric disorder Wernicke encephalopathy (WE) [4]. The classical symptoms of WE are delirium, ataxia and ophthalmoplegia. This disorder is

reversible if properly diagnosed and treated with parenteral thiamine administration. If left untreated, however, it causes severe and irreversible brain damage (Korsakoff syndrome) leading to death. The estimated mortality rate is about 20% [4]. Thiamine deficiency (TD) is recognized in various kinds of disease with associated loss of appetite including anorexia nervosa [5], diabetes mellitus [6], cancer [7, 8] and dementia [9]. However, no cases have been observed in family members caring for patients with dementia.

Here, we report a case in which a family member caring for her mother with dementia developed WE during the course of care.

Case presentation

A 63-year-old woman consulted our psychiatric outpatient clinic complaining of difficulty in providing care.

Six months prior to her visit she had started living at home with her mother due to her mother being diagnosed with vascular dementia. However, coping with the symptoms of dementia in her mother resulted in considerable fatigue. For this reason, she determined that it was difficult to continue care at home and she sent her mother to a nursing home two months prior to her visit. However, even after her mother was in the nursing home, she frequently requested her daughter visit her, and during that time the caregiver came to feel even more physically fatigued.

The caregiver's appetite began to decline when she moved her mother into the nursing home, dropping to about 70% of normal and then to about 30% 10 days before her visit to our clinic.

Physical examination at the time of consultation revealed general malaise. Neurologically, she experienced mild unsteadiness, but she was fully conscious and had no ocular symptoms. MRI examination of her head did not reveal any notable findings. Psychiatrically, neither depression nor a loss of

motivation was observed.

Her medical history revealed she was diagnosed with breast cancer eight years previously, for which she was treated by surgery and chemotherapy. At the time of her consultation she was not receiving any anti-cancer drugs, and follow-up had not revealed any signs of recurrence. She had been diagnosed with depression nine years earlier. She was still visiting a psychiatric department, but her mental state was stable due to medication and psychotherapy. She had no history of alcohol or drug dependence.

Based on the findings that her appetite had begun to decline from 2 months previously and had dropped to only about 30% of normal from 10 days previously, the fact that thiamine stores in the body are depleted in about 18 days [3] as well as reports that WE can present with an absence of consciousness disorders, but only some unsteadiness [4, 10], we considered that this patient may have been suffering thiamine deficiency, and thiamine 100 mg in combination with other B-group vitamins was administered twice intravenously, resolving her unsteadiness. Her serum thiamine level, as measured using high-performance liquid chromatography, was abnormally low at 21ng/ml (reference range: 24–66 ng/ml). Her vitamin B12 was 206

pg/mL (reference range: 180-914 pg/mL) and folic acid was 8.3 ng/mL (reference range: 4.00-999999.00 ng/mL), both of which were within the normal range. Further, no other blood biochemical abnormalities were found to explain the above-mentioned pathological condition. Based on these findings, she was diagnosed with WE. Thereafter, she experienced no further episodes of unsteadiness of gait. Oral administration of thiamine 75 mg was continued, and her standard of daily living returned to the same level as before she began caring for her mother.

Discussion and Conclusions

We experienced a case of WE in a family member caring for a dementia patient. This is the first reported case of WE resulting from thiamine deficiency due to the burden of dementia care.

Thiamine deficiency can be problematic in individuals with dementia [2, 9]. However, the nutritional status of the family members caring for a dementia patient has not been discussed to date. As WE may develop due to thiamine deficiency such as in this case, it may be necessary to consider the nutritional status, including thiamine, of family members caring for patients with dementia in the future.

The symptoms of WE are nonspecific and it is often difficult to diagnose. In particular, when there is no characteristic background factor such as heavy alcohol consumption as in this example, it becomes difficult to notice clinically. Moreover, in the case of a caregiver, clinical awareness may be delayed. In this case, WE diagnosis was triggered by a loss of appetite and unsteadiness. In this case, the fact that thiamine stores in the body are depleted in as little as 18 days [3] was beneficial to our diagnosis. This indicates that nutritional evaluation is important in making a clinical diagnosis in daily clinical practice.

The caregiver in this case had a history of depression, and recurrence of depression was important in terms of differential diagnosis. However, in this case, the feeling of fatigue and loss of appetite reported by the patient corresponded to the diagnostic criteria of depression but did not meet the diagnostic criteria for depression, and it wasn't considered that they were caused by the deterioration in mental symptoms such as a recurrence of depression. In addition, as severe fatigue has been reported as a symptom of thiamine deficiency [11], the fatigue in this case was not considered to represent the deterioration in depression.

Although a characteristic symptom of WE is delirium, no delirium was observed in this case. However, as some cases of WE have been reported without delirium [10, 12], it is necessary to differentiate WE from other conditions even when there is no delirium observed as the continued oversight of WE results in Korsakoff syndrome with severe and irreversible brain damage.

In conclusion, this report emphasized the fact that the burden of caring for a dementia patient affects the nutritional status of the caregiver. Thiamine deficiency should be one of the items considered as a nutritional issue in such

caregivers. Future research is expected to further clarify the nutritional issues in family members caring for people with dementia.

List of abbreviations

WE: Wernicke encephalopathy

TD: Thiamine deficiency

Declarations**Ethics approval and consent to participate**

Not applicable.

Consent for publication

Written consent was obtained from the patient.

Availability of data and materials

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

IM and OH diagnosed the patient with Wernicke encephalopathy. IM prepared the manuscript and conducted literature research. OH added clinical information from a perspective of a psychiatrist, conducted additional literature research, edited the manuscript, and deepened discussion. NU, KI, IS, AY helped to deepen discussion on the unusual presentation of this case. All authors read and approved the final manuscript.

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