

Case Report

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Subclinical thiamine deficiency identified by preoperative evaluation in an ovarian cancer patient: Diagnosis and the need for preoperative thiamine measurement

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Abstract

Objective. Although thiamine deficiency (TD) and Wernicke encephalopathy (WE) are not rare in cancer patients, the cases reported to date developed TD and/or WE after treatment had started.

Method. From a series of cancer patients, we report a patient diagnosed with TD without the typical clinical symptoms of WE at the preoperative psychiatric examination.

Result. A 43-year-old woman with ovarian cancer was referred by her oncologist to the psycho-oncology outpatient clinic for preoperative psychiatric evaluation. Her tumor had been growing rapidly before the referral. Although she did not develop delirium, cerebellar signs, or eye symptoms, we suspected she might have developed TD because of her 2-month loss of appetite as the storage capacity of thiamine in the body is approximately 18 days. The diagnosis of TD was supported by abnormally low serum thiamine levels.

Significance of results. Cancer therapists need to be aware that thiamine deficiency may occur even before the start of cancer treatment. In cases with a loss of appetite of more than 2 weeks' duration, in particular, thiamine deficiency should be considered if the tumor is rapidly increasing, regardless of the presence or absence of delirium.

Introduction

Thiamine, in its biologically active form, thiamine pyrophosphate, is an essential coenzyme for oxidative metabolisms (Sechi et al., 2016b). Wernicke encephalopathy (WE) is a neuropsychiatric disorder caused by severe acute/subacute thiamine deficiency (TD). This disorder is a medical emergency because it may result in severe and irreversible brain damage if left untreated (Korsakoff syndrome) (Isenberg-Grzeda et al., 2016a). However, this disorder is often underrecognized because of the diversity of symptoms, which include delirium, ataxia, eye symptoms, stupor, hypotension and tachycardia, hypothermia, bilateral visual loss and papilledema, epileptic seizures, hearing loss, hallucinations, and behavioral disturbance (Sechi et al., 2016a). Therefore, the best aid for the diagnosis of WE, particularly in patients with cancer, is clinical suspicion (Sechi & Serra, 2007).

Recent studies revealed that TD and WE are not uncommon in cancer patients referred for psychiatric examination (Isenberg-Grzeda et al., 2017) and are recognized in various stages of cancer trajectory at various levels, including postsurgery (postsurgical delirium) (Onishi et al., 2005), during treatment with anticancer drugs (Onishi et al., 2016), and in terminal stage patients (Onishi et al., 2004). However, these patients developed TD and/or WE after treatment had started.

In this communication, we report a TD patient with a rapidly growing ovarian cancer, who was diagnosed with TD at a preoperative psychiatric examination. The patient developed none of the classical triad of WE symptoms nor were any of the uncommon symptoms or signs apparent at presentation. Clinical suspicion, correct diagnosis, and treatment with parenteral thiamine administration prevented disease progression.

Case report

A 43-year-old woman with a rapidly growing ovarian cancer was referred by her oncologist to the psycho-oncology outpatient clinic for preoperative psychiatric evaluation. Her medical history indicated that she was intellectually challenged (total IQ = 44), and she had been living in nursing home from 2 years before the referral.

She developed menorrhagia 3 months prior and visited an obstetrics and gynecology clinic. An ovarian tumor of 5 cm in diameter was identified. Two months before referral, she developed abdominal pain. A huge (28 cm) mass was observed in the pelvic and abdominal cavity. She visited the Gynecologic Oncology Department of our hospital. A gynecologic oncologist judged that she needed psychiatric evaluation to decide whether she could undergo surgery and so consulted the Psycho-oncology Outpatient Clinic.

On the patient's first psychiatric examination, she did not show delirium or any neurological signs. Her blood pressure was 146/90 mmHg and pulse rate was 85 per minute. She said that she wanted to receive treatment and continue to live at the nursing home. She did not show any signs of delusion or hallucinations.

Staff members from the nursing home reported that she had been living quietly in the nursing home. They also said that her appetite had been approximately 50% of normal for the past 2 months. Although, she did not develop delirium, cerebellar signs, or eye symptoms, we suspected she might have TD resulting from the loss of appetite for the previous 2 months. The storage capacity of thiamine in the body is approximately 18 days (MacLean et al., 1983) and rapidly growing tumors can cause excessive consumption of thiamine (van Zaanen & van der Lelie, 1992).

We examined her serum thiamine level and then administered 100 mg of thiamine intravenously. Her serum thiamine level, measured using high-performance liquid chromatography, was abnormally low (12 ng/mL; reference range: 24–66 ng/mL), whereas her serum vitamin B12 level was within the normal range (230 pg/mL; reference range: 180–914 pg/mL). Based on these findings, she was diagnosed with subclinical TD and treated accordingly.

At 2 months after her visit to the Psycho-oncology Clinic, she underwent salpingo-oophorectomy without complication.

Discussion

Thiamine deficiency was identified in the preoperative evaluation of a patient with rapidly growing ovarian cancer.

Recent advances in research have led to the discovery of TD and WE in many cancer patients (Isenberg-Grzeda et al., 2014, 2016b; Onishi et al., 2004), with about 50% of cancer patients referred for psychiatric consultation reported to have thiamine deficiency, making it a not so uncommon condition (Isenberg-Grzeda et al., 2017). It has been reported that its onset is related to treatment (Isenberg-Grzeda et al., 2017); however, all reported cases to date were identified after the start of cancer treatment. The present case suggests that thiamine-deficient patients exist even in the preoperative evaluation stage.

One potential cause of the thiamine deficiency in this case was her loss of appetite. The patients experienced an approximately 50% decrease in appetite for a 2-month period. There is a good chance that such a decrease in appetite can lead to a deficiency (MacLean et al., 1983). Also, because the patient had a huge tumor in the peritoneal cavity, abdominal distension from tumor growth may also have contributed to her decrease in appetite.

A second potential cause of the deficiency is the consumption of thiamine resulting from the rapid increase in tumor size. In this case, the tumor had been growing rapidly for about 1 month. Further, thiamine deficiency associated with rapid tumor growth has also been reported in leukemia patients (van Zaanen & van der Lelie, 1992).

In the present case, we were able to prevent WE as a result of appropriate clinical diagnosis and treatment; however, we did not

recognize any of the three characteristic signs of WE: delirium, cerebellar signs, and eye symptoms. Diagnosis was triggered by her loss of appetite for >2 weeks and the rapid increase in tumor size. Recent studies have reported cases in which the three characteristic signs of WE were not apparent (Isenberg-Grzeda et al., 2017; Onishi et al., 2017, 2018). If a loss of appetite continues for >2 weeks and/or if the tumor grows rapidly, it is necessary to examine thiamine level regardless of the presence or absence of delirium.

If the treating physician identifies a malignant tumor, the presence of some deficit in dietary intake should be confirmed because it is possible for WE to develop before the start of cancer treatment. In particular, when a loss of appetite for >2 weeks and/or a rapid increase in tumor size is observed, it is necessary to consider the potential for thiamine deficiency regardless of delirium, and prophylactic thiamine treatment should be considered. Diagnosis and treatment of thiamine deficiency can help to protect patients from complications.

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