Case Report

Wernicke's encephalopathy after chemoradiotherapy for tongue cancer: Report of a case

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A B S T R A C T

A case of acute Wernicke's encephalopathy induced by thiamine deficiency due to malnutrition subsequent to chemoradiotherapy for tongue cancer is presented. A 63-year-old male patient had severe oral mucositis and mental stress in a long-term hospitalization for chemoradiotherapy of tongue cancer. After discharge from hospital, he had alcoholism and malnutrition. Three months later, disturbance of consciousness and ataxia followed by memory disturbance appeared. Laboratory examination revealed low serum level of thiamine. The symptoms, laboratory data, and magnetic resonance imaging suggested acute Wernicke's encephalopathy. The patient was intravenously administered thiamine and received nutritional control, thereby the symptoms were improved.

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1. Introduction

Wernicke's encephalopathy, a thiamine deficiency disorder, is a neurological emergency and can be fatal if untreated. It occurs commonly associated with alcoholism and is characterized by changes in consciousness, oculomotor dysfunction, and ataxia [1]. Thiamine, also known as vitamin B₁, is an essential nutrient required by all tissues. Thiamine deficiency can lead to death. The mortality rate is reported 17–20%, and 85% of survivors developed Korsakoff's psychosis characterized by short-term memory disorder [2].

Oral mucositis is a significant problem for cancer patients receiving high-dose head and neck radiation therapy and occurs at the frequency of 85–100% [3]. We report a case of a tongue cancer patient showing acute Wernicke's encephalopathy due to severe oral mucositis induced by chemoradiotherapy and successfully treated by intravenous thiamine therapy.

2. Case report

A 63-year-old male was referred to our clinic with a chief complaint of ulcer formation which had induration measuring 42 mm × 25 mm of the left tongue margin. The left submandibular lymph node showed increased fluorodeoxyglucose uptake in positron emission tomography. On biopsy, the lesion was diagnosed as a tongue squamous cell carcinoma (T3N1M0). As the patient strongly hoped for conservative therapies, we performed a superselective intra-arterial chemotherapy by the Seldinger technique (cisplatin 50 mg/bolus/week for 4 weeks) and concurrent radiotherapy (total dose: 60 Gy). After chemoradiotherapy, the primary tumor and metastatic lymph node had regressed, although severe oral mucositis remained. The patient suffered from mental stress after long-term hospitalization for chemoradiotherapy and hoped to be discharged from our hospital as soon as he finished his chemoradiotherapy course. After that, he had little food because of painful oral mucositis and ageusia induced by chemoradiotherapy. He unavoidably depended on alcohol and had an unbalanced diet. After three months, his family noticed his memory disorder. Neurologically, disturbance of consciousness, confusion, and ataxia were recognized, and ophthalmoplegia was slightly shown. The patient had vacant eyes and his eyes did not respond to surrounding movement. Laboratory examination showed almost normal ranges; a red blood cell count of 3.83 × 10⁶ µl⁻¹, a hemoglobin level of 13.3 g/dl, a white blood cell count of 3260 µl⁻¹, and a platelet count of 14.8 × 10⁴ µl⁻¹. A serum liver chemistry profile showed aspartate aminotransaminase 152 U/l, and alanine aminotransferase 78 U/l, and the level of total protein was at 8.0 g/dl. However, thiamine level was at 10 ng/ml, lower than normal range (20–50 ng/ml). Magnetic resonance imaging (MRI) showed a periaqueductal high signal intensity area in T2WI, but did not show primary tumor recurrence, lymph node metastasis, metastasis to the brain, or atrophy of hippocampus (Fig. 1). Positron emission tomography–computed tomography did not show any abnormality in his whole body. He was diagnosed with Wernicke's encephalopathy by these symptoms and imaging findings. Immediately we conducted nutritional control and administered thiamine (100 mg) intravenously under hospitalization for two weeks. After recovery of thiamine level
(66 ng/ml after 2 weeks), the symptoms were rapidly improved. However, he lost the memory of some months before thiamine treatment, and the forgotten memory remained lost. Unfortunately, this event triggered the retirement from his job.

3. Discussion

Wernicke’s encephalopathy is most commonly observed in people with alcoholism. Alcoholism interferes with absorption of nutrients including thiamine from the digestive system [4]. Therefore, more thiamine is needed than the ordinary level in patients with alcoholism. The traditional triad of this disease is confusion, ataxia, and ophthalmoplegia, but the symptoms are often absent in alcoholic and non-alcoholic cases [5–7]. According to the criteria of Caine et al. [8], Wernicke’s encephalopathy can be diagnosed by any two of eye signs, cerebellar dysfunction, altered mental state, and dietary deficiencies. In our patient, we found eye signs and altered mental state. Although a periaqueductal high signal area on the MRI was not typical [9], it may be due to the time when MRI was taken. In addition, the memory disorder of two months seen before thiamine treatment suggested that progression to Korsakoff’s psychosis occurred [10]. When thiamine deficiency is suggested in a patient, we should treat him immediately without waiting for the laboratory data of thiamine level. Recommended treatment is administration of 500 mg thiamine intravenously for 2–3 days and 250 mg daily for the next 3–5 days [11].

Thiamine deficiency has rarely been described recently in patients with head and neck cancer. Cho et al. [12] and Aksoy et al. [13] reported Wernicke’s encephalopathy in patients receiving fluorouracil-based chemotherapy for nasopharyngeal cancer. Fikhman et al. [14] reported two cases in a patient receiving post-operative chemoradiotherapy for tongue cancer and in a patient receiving primary chemoradiotherapy for tonsil cancer.

Radiotherapy for oral cancer almost always causes severe oral mucositis or loss of appetite, therefore the risk of low nutrition is very high. In particular, we must pay attention to the aged who live at home alone receiving terminal cancer therapy, because they are unable to manage nutrition on their own. We also have to take into account the social background of our cancer patients as well as their local lesions and courses of their therapy. In the follow-up of the patient after treatment for oral cancer, we should check not only malnutrition but also thiamine level in laboratory tests, if we noticed symptoms suspected of Wernicke’s encephalopathy.

Conflict of interest

All authors declare no conflict of interest.

References