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Case Report

Leukemia Case in Patient with Taste Dysfunction

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Abstract

A blood examination was carried out in order to assess the serum zinc level in a patient with taste dysfunction. A blood cell count was also performed simultaneously and promyelocytic leukemia was identified. This case provides an example of leukemia being detected at the time of a blood test being given to assess taste dysfunction.

Key words: Taste dysfunction—Taste examination—Leukemia—Serum zinc levels—Blood examination

Introduction

There are various types of taste dysfunction, and both recognition and treatment are usually complicated. Serum zinc level exerts an effect on taste dysfunction. Therefore, its assessment has now become standard practice in obtaining a diagnosis in such cases[3–5,7]. A drop in serum zinc level has been reported in acute lymphocytic leukemia, along with significantly higher thresholds for the recognition of all four taste qualities[8,9]. In addition, patients who have received bone marrow transplants have been reported to be prone to taste dysfunction following surgery[6].

This is a case report on a patient diagnosed with acute promyelocytic leukemia after presenting with taste dysfunction.

Case Report

The patient was a sixty-year-old man who returned to our hospital complaining of a diminished ability to sense sweetness after receiving medical care here 4 years previously. His clinical history from his earlier visit shows that administration of methylcobalamine (Methycobal®) at 1.5 mg/day for 28 days significantly ameliorated the taste dysfunction and that the results of his white blood cell count were within the normal range.

The patient complained of experiencing cold-like symptoms and vertigo for 26 days prior to his coming to the hospital. In addition to experiencing a bitter taste throughout the entire oral cavity, he was also aware of a reduction in sensitivity to taste, especially in

Table 1 Results of taste examination

				Concentration				
		ETE(dB)	Modality	1	2	3	4	5
Anterior tongue	Left	4	Sweet			●		
			Salt		●			
			Sour		●			
			Bitter					●
	Right	4	Sweet			●		
			Salt		●			
			Sour		●			
			Bitter					●
Posterior tongue	Left	6	Sweet				●	
			Salt			●		
			Sour				●	
			Bitter					NS
	Right	6	Sweet				●	
			Salt		●			
			Sour				●	
			Bitter			●		
Soft palate	Left	10	Sweet					NS
			Salt				●	
			Sour					NS
			Bitter					NS
	Right	12	Sweet					NS
			Salt				●	
			Sour					NS
			Bitter					NS

Electrical Taste Examination (ETE): Normal range found in electrical taste examination: less than 8 dB in anterior tongue, less than 14 dB in posterior tongue, and less than 22 dB in soft palate.
Sense (●); No Sense (NS)
Concentration of sweet, salt, sour and bitter: Sweet—sucrose solution (1–0.3%, 2–2.5%, 3–10%, 4–20%, 5–80%); Salt—sodium chloride solution (1–0.3%, 2–1.25%, 3–5%, 4–10%, 5–20%); Sour—tartaric acid solution (1–0.02%, 2–0.2%, 3–2%, 4–4%, 5–8%); Bitter—quinine solution (1–0.001%, 2–0.02%, 3–0.1%, 4–0.5%, 5–4%); Normal range found in filter-paper disk examination: less than 3 degrees for each taste solution.

the anterior area of the tongue. At first, the patient thought that these symptoms of taste dysfunction were due to his cold. However, these symptoms persisted and were still present on the day of the first examination on his return. Fifteen days prior to that, the sensations of vertigo and nausea had become unbearable, and the patient sought out professional help, going to a brain surgery hospital. However, no abnormality was found. Although prescribed 18 mg/day of betahistine mesilate (Merislon®) for 7 days there, the vertigo, cold-like symptoms and taste dysfunction persisted. At the first examination carried out at this hospital, the patient's gingiva showed a slightly whitish appearance, although neither abnormal bleeding, nor atrophy of the papillae and/or changes in tongue color were observed. It was then suspected that the patient might be anemic, and a blood examination was carried out.

The results of the taste examination are shown in Table 1. The results obtained from the electrical taste examination (ELECTRO

Table 2 Results of blood examination (Remarkable decrease in white blood count)

Blood examination	Results	Unit
WBC	0.7	$\times 10^3/\mu$l
RBC	4.4	$\times 10^6/\mu$l
Hb	13.4	g/dl
Ht	37.8	%
MCV	87	fl
MCH	31	pg
MCHC	36	g/dl
thrombocyte count	18.9	$\times 10^4/\mu$l
reticulocyte	2	%
neutrophil	21.4	%
basocyte	0.2	%
eosinocyte	0.6	%
monocyte	2.9	%
lymphocyte	71.7	%
LUC	3.2	%

CUSTOMETER, EG-IIB, NAGASHIMA MEDICAL INSTRUMENTS Co., LTD.) were within the normal range. However, when a filter-paper disk method test (Taste Disk®, Sanwakagaku-kenkyujyo) was applied, the taste thresholds observed in the posterior area of the tongue and the palatal area were higher in comparison to that in the anterior area of the tongue. Serum zinc level was 72μg/dl (measurement not shown), which was a little low, but within the normal range (66–110μg/dl).

The results of the blood examination are shown in Table 2. An extremely low white blood count was recognized (700 cells/μl). And in addition, Auer's bodies were found in a blood smear (Fig. 1).

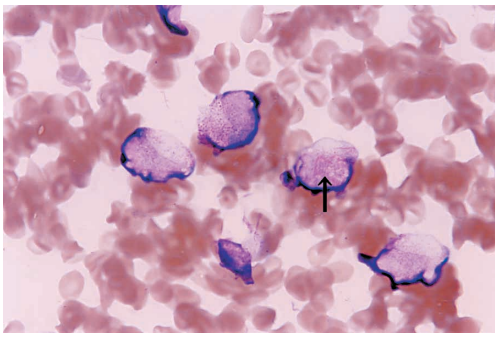

Fig. 1 Smear of capillary blood
Rod-like structures (Auer's bodies) observed in cytoplasm of promyelocyte (arrow). Giemsa-stained

Discussion

Taste dysfunction has been associated with a reduction in serum zinc levels. Therefore, serum zinc level examinations are now standard practice in the diagnosis of taste dysfunction[3–5,7]. In this case, our patient also reported experiencing slight vertigo and cold-like symptoms. Taking these symptoms into consideration, a complete blood cell count was added to the examinations to be given, and a remarkable decrease in white blood cells was observed. A blood corpuscle smear test was then carried out which showed the presence of Auer's bodies. Consequently, the patient was diagnosed as having acute promyelocytic leukemia, and was referred to a medical specialist for urgent hospitalization.

Previous studies have reported a drop in serum zinc levels in patients with acute lymphocytic leukemia[8]. Moreover, it has been reported that leukemic children show significantly higher thresholds for the detection of sweet and sour tastes than healthy children, as well as significantly higher thresholds for the recognition of all four taste qualities[9]. However, no reports are available with regard to the relation between acute promyelocytic leukemia and taste dysfunction. On the other hand, one previous study reported that patients who have received bone marrow transplants, and who are undergoing radiotherapy and chemotherapy, exhibit taste dysfunction as a side effect of such treatment[2]. It has also been reported that post-bone marrow transplant patients are prone to changes in their taste thresholds, as well as changes in their sensitivity to sweet, sour and salty tastes[1,6], and that this decrease in taste sensitivity recovers by up to 80% during the first year after transplantation[6]. Considering these previous reports, we suggest that bone marrow function is related to taste dysfunction.

There are many causative factors in taste dysfunction, and their identification is very complicated. We have not yet established a precise cause-effect relationship between leukemia and taste dysfunction. Moreover, it is possible that leukemia and taste dysfunction occur simultaneously.

In this case report, we looked at an example of the diagnosis of acute promyelocytic leukemia made on the basis of a white blood cell count which was obtained in addition to the standard blood examination given to assess taste dysfunction. We therefore strongly recommend the inclusion of a complete blood cell count in routine blood examinations for taste dysfunction

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