A Case of Zinc Deficiency Histologically Showing Spongiform Pustules of Kogoj

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Sir,
We describe here a case of zinc deficiency histologically showing spongiform pustules of Kogoj during enteral nutrition.

CASE REPORT

An 89-year-old Japanese woman was referred to us for evaluation of multiple scaly erythematous plaques with erosions that had developed over her entire body. She had received enteral feeding because of eating disorders for 9 months. Although she had been treated with topical steroid ointment and oral administration of prednisolone and terbinafine before admission to our department, there was no response. Due to concurrent severe diarrhoea, she was also treated with intravenous antibiotics (imipenem), but the treatment was not effective. Physical examination revealed multiple erythematous plaques with oedema, irregular in shape, on her face, especially around the eyelids, vulva, trunk and extremities (Fig. 1). The centre of each erythema was erosive, and some pustules were observed on the surface.

Laboratory examinations demonstrated the following values: white blood cell count 13.2×10^9/l; C-reactive protein 6.9 mg/dl; serum zinc level 5.2 μmol/l (normal range 9.2–20 μmol/l). No fungus was found on the erythema. A biopsy specimen taken from the erythema with pustules showed hyperkeratosis, parakeratosis, acanthosis and subcorneal spongiform pustules of Kogoj (Fig. 2). Based on these findings, a diagnosis of zinc deficiency was made. Supplementation of zinc by oral administration of zinc sulphate for 2 weeks improved the skin lesions.

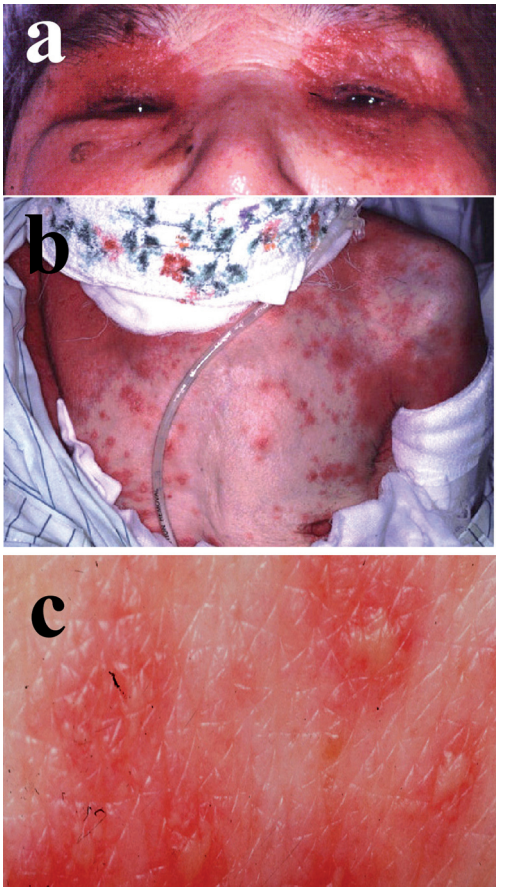

Fig. 1. (a, b) Multiple oedematous irregular erythemas on her face, especially around the eyelids, trunk and extremities. (c) Milia-sized pustules on the erythema.

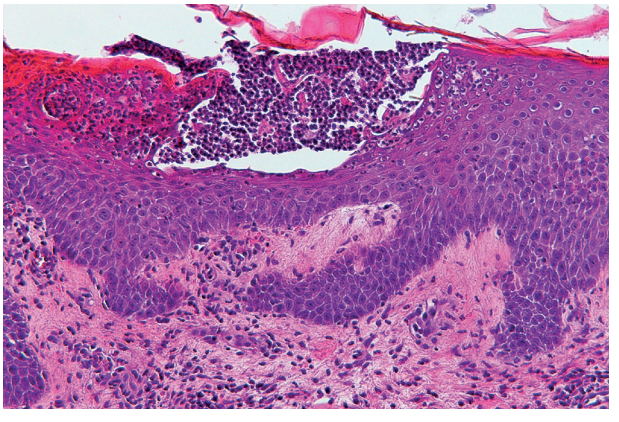

Fig. 2. Spongiform pustules of Kogoj (haematoxylin-eosin ×200).

DISCUSSION

This patient characteristically showed erythematous plaques around the eyelids and vulva and diarrhoea related to zinc deficiency caused by long-term enteral nutrition. Although she had received enteral feeding with an enteral diet formula, MA-8®, that contained 0.1 mg zinc per 100 kcal, she had taken only 1 mg zinc per day (at least 10 mg zinc per day usually being necessary), resulting in zinc deficiency. It has been shown that intravenous hyperalimentation with low zinc content can cause zinc deficiency (1). Such cases are rare because of the recent improvements in intra-

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venous alimentation products. However, a few cases of zinc deficiency associated with enteral nutrition are still reported (2, 3). Zinc is an essential element in human nutrition. Although zinc is now added routinely to enteral nutrition, we have to pay attention to the zinc component because the amount of zinc may not be sufficient for the patient. In cases of chronic zinc deficiency, there are psoriasis-like histopathological changes to the epidermis (4). However, only one case of neutrophilic microabscesses in the stratum corneum related to zinc deficiency has been reported so far (5). Interestingly, plasma zinc may be decreased in generalized pustular psoriasis (6) or erosive pustular dermatitis of the leg (7). Although the exact mechanism underlying the histopathological features of our case is not clear, we make the following speculation. It has been suggested that the concentration of zinc in the epidermis is 5- or 6-times higher than that in the dermis (8). Zinc deficiency could easily affect epidermal cells, causing accumulation of neutrophils in the epidermis.

Differential diagnosis includes pustular psoriasis, fungal infection and impetigo. Supplementation of zinc in the present case, however, resulted in rapid and complete resolution of the symptoms, ruling out such possibilities.

We emphasize that it is important for clinicians to include zinc deficiency in the differential diagnosis of skin diseases with spongiform pustules of Kogoj.

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