OPEN ACCESS Freely available online

ISSN: 2090-7214
Clinics in Mother and Child Health

Commentary

A Study of a Sibling with Intractable Eczema Caused by Zinc Deficiency due to Low-Zinc Breastfeeding

Yota Tabata*, Shozo Maeda

Department of Pediatrics, Isesaki Munincipal Hospital, Tsunatorihonmachi, Isesaki, Gunma, Japan

ABSTRACT

Zinc deficiency may present with symptoms such as dermatitis, alopecia, decreased appetite, and growth retardation. When an infant presents with intractable dermatitis, zinc deficiency should be considered in the differential diagnosis, which may have been caused due to low levels of zinc in the breast milk.

In the present study, we observed three siblings with intractable eczema due to zinc deficiency caused by low-zinc breast milk.

All three patients presented with intractable dermatitis within four months of birth and had significantly lower serum zinc levels. The reason for this was insufficient zinc intake from low-zinc breast milk. In all the three cases, the symptoms improved with the administration of zinc preparations.

Breastfeeding is an essential nutritional method with many advantages. However, it is necessary to recognize that even complete breastfeeding may cause zinc deficiency.

Keywords: Zinc deficiency; Low zinc breast milk; Intractable eczema; Sibling case

DESCRIPTION

Breastfeeding plays an essential role in maintaining infant health. A report showed that breastfeeding reduced common infections in 6-month-old infants, pointing to the need for health and social equity interventions to ensure access to breastfeeding [1,2]. The WHO recommends breastfeeding for up to six months after birth [3].

However, it is a concern that breastfeeding may not be perfect. For example, a few cases of zinc deficiency due to low-zinc breast milk have been reported [4-7]. When zinc is deficient, symptoms often appear around two months of age in completely breastfed infants, this condition is referred to as Transient Neonatal Zinc Deficiency (TNZD) [8]. The symptoms of zinc deficiency in newborns include intractable dermatitis, which initially appears around the lips.

The cause of low-zinc breastfeeding is the inability of the mother's body to transfer zinc into her milk due to an abnormality in the *ZnT2/SLC30A2* gene. TNZD does not recur after weaning because the child's ability to digest and absorb zinc is not affected [8].

In the present study, three siblings developed zinc deficiency due to low-zinc breast milk, resulting in intractable eczema [9].

A 4-month-old male child presented to our clinic with a chief complaint of intractable eczema. The child was completely breastfed, and his serum zinc levels were 19 μg/dL, which indicate zinc deficiency. The mother's serum zinc levels were normal, but she had milk with low zinc levels, confirming the diagnosis of zinc deficiency due to low-zinc breastfeeding. Genetic testing of the mother revealed no ZnT2 mutations.

After the second child's birth, when eczema appeared mild at three months of age, serum zinc levels were as low as 40 μg/dL. A zinc formula was administered, and the zinc deficiency did not worsen.

However, the third child did not present to our department after delivery, and instead was attended to by a local dermatologist. Due to a lack of family history interviews, he was diagnosed with

Correspondence to: Yota Tabata, Department of Pediatrics, Isesaki Munincipal Hospital, Tsunatorihonmachi, Isesaki, Gunma, Japan, E-mail: onetoy999@yahoo.co.jp

Received: 31-May-2022, Manuscript No. CMCH-22-16833; **Editor assigned:** 03-Jun-2022, PreQC No. CMCH-22-16833 (PQ); **Reviewed:** 16-Jun-2022, QC No CMCH-22-16833; **Revised:** 23-Jun-2022, Manuscript No. CMCH-22-16833 (R); **Published:** 30-Jun-2022, DOI: 10.35248/2090-7214.22.19.413.

Citation: Tabata Y, Maeda S (2022) A Study of a Sibling with Intractable Eczema Caused by Zinc Deficiency Due to Low-Zinc Breastfeeding. Clinics Mother Child Health. 19:413.

atopic dermatitis and was unaware that his older siblings had been treated for zinc deficiency. At four months of age, eczema did not improve and the patient was referred to our department for refractory eczema. As expected, the third child had low serum zinc levels (24 μg/dL). The skin symptoms improved rapidly following the administration of a zinc preparation.

Zinc is a trace element involved in the synthesis and breakdown of several biological components and is essential for growth and development, skin and bone metabolism, etc.

Perioral dermatitis, alopecia, and diarrhea are the three most common symptoms of zinc deficiency. Other known symptoms include taste disorders and growth disturbance [10]. Perioral dermatitis appears as the initial symptom, followed by alopecia, gastrointestinal symptoms, and in chronic cases, growth disturbances (poor weight gain, short stature), infection, and taste disorders [11]. Zinc deficiency dermatitis is characterized by eczematous or psoriasiform plaques with well-defined borders, often with peripheral scaling and crusting. Vesicles or rosacea may appear, and lesions occur primarily in the perioral and anogenital areas [10]. Differentiation is necessary because the disease is often diagnosed as atopic dermatitis.

A low serum ALP level is helpful in blood tests. If zinc deficiency is suspected, serum zinc levels should be measured. Serum zinc levels of less than 60 μg/dL are diagnosed as zinc deficiency and those in the range of 60-80 μg/dL, as subclinical zinc deficiency. However, it is not uncommon, as it has been reported that approximately 25% of patients with atopic dermatitis [12] and 31% of healthy children aged 1-3 years living in three high-income Western European countries are zinc deficient [13].

Known causes of zinc deficiency include inadequate dietary zinc intake, impaired absorption from the gastrointestinal tract, and systemic diseases, such as liver disease. In particular, the presence of zinc deficiency in infants should be considered in regard to enteric acrodermatitis, which presents as zinc malabsorption and insufficient zinc consumption due to low-zinc content in breast milk.

Treatment of zinc deficiency generally recommends the consumption of zinc-rich oysters, meat, and grains. However, if symptoms of zinc deficiency develop, administration of zinc preparations may be effective.

In the present study, we treated three siblings with refractory eczema due to zinc deficiency, all three patients had onset within four months and had significantly low serum zinc levels. The cause of zinc deficiency was determined to be insufficient zinc intake due to low-zinc breast milk. The mothers had normal serum zinc levels, and significantly low levels of zinc in breast milk were thought to be since a poor transfer, however, no associated genetic mutations were discovered.

CONCLUSION

Zinc deficiency should be included in the differential diagnosis when the child presents with refractory eczema at less than six months of age, and the lower amount of zinc in breast milk should be recognized.

It should be noted that although breastfeeding is highly beneficial, it may not be perfect. It is an essential source of nutrition for infants.

REFERENCES

1. Penugonda AJ, Rajan RJ, Lionel AP, Kompithra RZ, Jeyaseelan L, Mathew LG. Impact of exclusive breast feeding until six months of age on common illnesses: A prospective observational study. Fam Med Prim Care Rev. 2022;11(4):1482.
2. Vilar-Compte M, Pérez-Escamilla R, Ruano AL. Interventions and policy approaches to promote equity in breastfeeding. Int J Equity Health. 2022;21(1):1-7.
3. Global strategy for infant feeding and young child feeding. Geneva: World Health Organization. 2003.
4. Kimura S, Ashida A, Kawamura N. A case of zinc deficiency caused by low zinc breast milk. J Jpn Pediatr Soc. 1997;101:1397-1402.
5. Kurakata N, Baba S, Suzuki H. Zinc from low-zinc breast milk deficiency. Jp Clin Dermatol. 1994;48:967-971.
6. Okumur S, Terakawa T, Yokoro S. Zinc metabolism in newborns and premature babies: Nutritional evaluation and treatment. J Amb Gen Pediatr. 2009;12:221-225.
7. Kuramoto Y, Igarashi Y, Kato S, Tagami H. Acquired zinc deficiency in two breast-fed mature infants. Acta Derm Venereol. 1986;66(4):359-361.
8. Kambe T, Fukue K, Ishida R. Microcytic anemia during the course a case of zinc deficiency due to low-zinc breast milk. J Nutr Sci Vitaminol. 2015;61:44-46.
9. Tabata Y, Maeda S. Three siblings with zinc deficiency who presented with eczema due to low zinc content in breast milk. Kitakanto Med J. 2022;72:97-100.
10. Glutsch V, Hamm H, Goebeler M. Zinc and skin: An update. J Ger Soc Dermatol. 2019;17(6):589-596.
11. Iwama A, Hasegawa H. Zinc metabolism in newborns and premature babies: Nutritional assessment and treatment. Jpn J Nutr Ass. 2000;17:277-282.
12. Ehlayel MS, Bener A. Risk factors of zinc deficiency in children with atopic dermatitis. 2020;52(1):18-22.
13. Vreugdenhil M, Akkermans MD, van der Merwe LF, van Elburg RM, van Goudoever JB, Brus F. Prevalence of zinc deficiency in healthy 1-3-year-old children from three western european countries. Nutr. 2021;13(11):3713.