

CASE REPORT

Open Access



# A kwashiorkor case due to the use of an exclusive rice milk diet to treat atopic dermatitis

Francesca Mori<sup>1\*</sup>, Daniele Serranti<sup>2</sup>, Simona Barni<sup>1</sup>, Neri Pucci<sup>1</sup>, Maria Elisabetta Rossi<sup>1</sup>, Maurizio de Martino<sup>3</sup> and Elio Novembre<sup>1</sup>

## Abstract

Although several cases of severe hypoalbuminemia resulting from rice milk have been described in the past, today the use of rice milk without nutritional counseling to treat eczema is still a continuing, poor practice. We describe a kwashiorkor case in an infant with severe eczema exclusively fed with rice milk. It is well documented that rice milk is not a sufficient protein source. Moreover, only a small portion of eczema is triggered by food allergy. In conclusion this case raises the importance of managing dietary changes facing food allergies with responsibility for specialized consensus among pediatricians, nutritionists, endocrinologists and allergists all of them specialist professionals.

## Background

We describe a case of severe hypoalbuminemia provoked by an unnecessary and inappropriate elimination diet based on rice milk in an infant with severe atopic dermatitis (AD), which was thought to be secondary to food allergy.

## Case presentation

An exclusively breastfed boy infant developed AD at the age of 4 months. In the beginning, the eczema was treated with antibiotics, topical steroids and brief courses of oral steroids. The mother was dissatisfied by the outcome of the pediatrician's advice so she consulted a naturopathic doctor who prescribed a restricted diet.

At 6 months the child's daily diet consisted of rice milk, fruits, rice poultry and vegetable broth.

After about 2 months of this diet, the child began to reject the food, in particular solid foods and to suffer from dysphonia and dysphagia due to the occurrence of laryngeal edema. Because of this the child was given only rice milk. After a few days the edema appeared on his feet, legs and upper extremities followed by a reduced urine output. He had no symptoms of gastroesophageal reflux, but he had forceful vomiting. When hospitalized, he was in a poor clinical condition with generalized edema (Fig. 1) and low urine output. He weighed 7.600 Kg from the age of six months up to 1 year. Blood and urine findings were normal except

for the following results: total protein 3 g/dl; albumin 1.365 g/dl (45.5 %); total serum IgE 30 KUA/L; specific serum IgE: milk 0.64 KUA/L; albumen 1.74 KUA/L. Protein was not found in the urine. He required central access due to difficulty obtaining peripheral access due to severe edema. He was also found to be anemic with a haemoglobin 5.7 g/dl and he received 4 g of albumin three times in 48 h, a red blood cells transfusion, oral iron and folic acid. Vitamin K was also supplied because of a state of coagulopathy [activated partial thromboplastin: 31 s; prothrombin time 69 % (normal value: 80–100 %)]; fibrinogen 139 mg/dl; antitrombin III: 65 % (normal value: 80–100 %)]. The child was immediately fed with cow's milk, which was well tolerated. Guidance from a nutritionist was essential and the edema gradually resolved.

After few days diuresis increased and weight initially decreased. Eczema improved and scratching was less evident thanks to topical treatment. Haematic examinations performed on day 10 showed a normalization of total protein, albumin and clotting tests. On follow up the skin prick test was negative to milk and egg allergy.

Because of a long lasting low blood calcium level (7.3 mg/L), he developed demineralization of his teeth, persisting at the follow up visits up at 2 years of age.

This kwashiorkor case highlights the potential danger of inappropriate elimination diets in infants with AD, and illustrates the need for careful nutritional guidance in the

\* Correspondence: f.mori@meyer.it

<sup>1</sup>Allergy Unit, Anna Meyer Children's University Hospital, Viale Pieraccini 24, 50139 Florence, Italy

Full list of author information is available at the end of the article



**Fig. 1** Fovea sign

management of AD. The use of rice milk resulted in hypoalbuminemia and poor weight gain.

Eczema is a chronically relapsing inflammatory skin disease and one of the most common skin disorders affecting up to 17 % of children [1], and it can rarely be managed with dietary changes alone.

Previous studies described similar cases [2–5], showing that alternative to cow's milk such as rice in spite of fortification are not a sufficient protein source.

The very first case was described by Carvalho NF et al. in 2001 [3]. In 2003 Novembre et al. described a similar case [4] and after more than 10 years the same mistake is still not so rarely made.

## Conclusions

This case reinforces the concept that hypoallergenic diets should be managed by allergists with experience in food allergies. Consultation and consensus should be achieved between specialists in pediatrics, allergy, nutrition and endocrinology, before adopting severely restrictive diets. Consequently, the choice of an elimination diet should be limited to children with moderate to severe eczema not controlled by topical steroids, under strict nutritional surveillance [6–8].

## Consent

Written informed consent was obtained from the patient for the publication of this Case Report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this Journal.

## Abbreviations

AD: Atopic dermatitis.

## Competing interests

The authors declare that they have no competing interests.

## Authors' contributions

FM has made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; DS has been involved in drafting the manuscript and revising it critically for important intellectual content; SB has made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data, NP has been involved in drafting the manuscript and revising it critically for important intellectual content; EMR has made substantial contributions to acquisition of data and interpretation of data; MdeM has made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; EN has given final approval of the version to be published and was agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors read and approved the final manuscript.

## Acknowledgements

The authors express their gratitude to the parents of the patient, who graciously authorised the publication of the information here expressed.

## Author details

<sup>1</sup>Allergy Unit, Anna Meyer Children's University Hospital, Viale Pieraccini 24, 50139 Florence, Italy. <sup>2</sup>Department of Health Sciences, University of Florence, Viale Pieraccini 24, 50139 Florence, Italy. <sup>3</sup>Infectious Diseases Unit, Anna Meyer Children's University Hospital, Viale Pieraccini 24, 50139 Florence, Italy.

Received: 10 February 2015 Accepted: 4 August 2015

Published online: 21 August 2015

## References

1. Spergel JM. Epidemiology of atopic dermatitis and atopic march in children. *Immunol Allergy Clin North Am*. 2010;30(3):269–80.
2. Keller MD, Shuker M, Heimall J, Cianferoni A. Severe malnutrition resulting from use of rice milk in food elimination diets for atopic dermatitis. *Isr Med Assoc J*. 2012;14(1):40–2.
3. Carvalho NF, Kenney RD, Carrington PH, Hall DE. Severe nutritional deficiencies in toddlers resulting from health food milk alternatives. *Pediatrics*. 2001;107(4):E46.
4. Novembre E, Leo G, Cianferoni A, Bernardini R, Pucci N, Vierucci A. Severe hypoproteinemia in infant with AD. *Allergy*. 2003;58(1):88–9.
5. Hon KL, Nip SY, Cheung KL. A tragic case of atopic eczema: malnutrition and infections despite multivitamins and supplements. *Iran J Allergy Asthma Immunol*. 2012;11(3):267–70.
6. Boguniewicz M, Leung DY. Atopic dermatitis: a disease of altered skin barrier and immune dysregulation. *Immunol Rev*. 2011;242(1):233–46.
7. Boguniewicz M. Preface. *Atopic dermatitis Immunol Allergy Clin North Am*. 2010;30:xv.
8. Nicol NH, Boguniewicz M. Successful strategies in atopic dermatitis management. *Dermatol Nurs*. 20;5(Supplement):3–18.

**Submit your next manuscript to BioMed Central and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
www.biomedcentral.com/submit

