Atopic dermatitis in a phenylketonuric untreated patient

This is the author's manuscript

Original Citation:
Atopic dermatitis in a phenylketonuric untreated patient / Fava p; Fierro MT; Brizio M; Marra E; Spada M; Bernengo MG. - In: INTERNATIONAL JOURNAL OF DERMATOLOGY. - ISSN 0011-9059. - ELETTRONICO. - 54:5(2015), pp. 568-570.

Availability:
This version is available http://hdl.handle.net/2318/156436 since

Published version:
DOI:10.1111/ijd.12043

Terms of use:
Open Access
Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)
Atopic dermatitis in a phenylketonuric untreated patient

Paolo Fava1, MD, Maria Teresa Fierro1, MD, Matteo Brizio1, MD, Elena Marra1, MD, Marco Spada2, MD, and Maria Grazia Bernengo1, MD

1 Department of Biomedical Sciences and Human Oncology, Section of Dermatology, University of Turin, Turin, Italy, 2 Department of Pediatric and Adolescence Sciences, University of Turin, Turin, Italy

Correspondence
Maria Teresa Fierro, MD Department of Medical Sciences Section of Dermatology, University of Turin v. Cherasco 23, 10126, Torino, Italy E-mail: mariateresa.fierro@unito.it

Conflicts of interest: None.

doi: 10.1111/ijd.12043

Phenylketonuria (PKU) is an autosomal recessive metabolic disease, which is seen in approximately 1:12,000–1:18,000 newborn.1,2 PKU results from a deficiency of phenylalanine hydroxylase, the enzyme converting phenylalanine into tyrosine. Hyperphenylalaninemia is the biochemical hallmark of PKU. Classic phenylketonuria is caused by a complete or near-complete deficiency of phenylalanine hydroxylase activity;3 without dietary restriction of phenylalanine, patients will develop profound and irreversible intellectual disability and neurological disturbances.2 The natural history of this disorder has been changed since newborn screening was introduced in the late 1960s, and affected children are now maintained on a phenylalanine restricted diet, which must commence as soon as possible after birth and should continue for life.4,5 Skin disorders linked with PKU are principally scleroderma-like changes with guttate or generalized morphea and hypopigmentation; dermatitis is also described in these patients.6–10 An accurate description of clinical features of this dermatitis cannot be found in the literature, and the relationship with atopic dermatitis, a multifactorial, inflammatory skin disease with a chronic or relapsing course, has never been analyzed thoroughly.11–13

Case report

We report the case of a 44-year-old Caucasian man with PKU complicated with atopic dermatitis referred to our institution for the worsening of erythematous areas of white scales, crusts, and multiple scratching lesions located at forearms, shoulders, inferior limbs, and sacral region (Figs. 1a and 2a). The Fitzpatrick phototype was I. Personal history revealed PKU first diagnosed at eight years old; PKU was not recognized in the neonatal period, thus the patient had a free diet that resulted in a permanent mental handicap. In addition, after PKU diagnosis, adhesion to dietary restriction was poor because of low family compliance. Since childhood, the patient has suffered from dermatitis with chronic pruritus and frequent infectious episodes, which has been diagnosed as atopic dermatitis and treated for years with topical steroids. Previous patch tests (with the European Standard Series of haptons) were negative. Biochemistry revealed leukocytosis (white blood cell count 10.34 × 10⁹/L) with eosinophilia (13%; absolute count: 1.87 × 10⁹/L) and elevation of IgE levels (4145 kU/L); plasma phenylalanine concentration was 1250 lmol/L (normal values lower than 120 lmol/L); flow cytometry on peripheral blood lymphocytes failed to document an imbalance between different T-cell populations. Skin culture on lesions identified a non-MRSA Staphylococcus aureus. Histological findings were nonspecific, showing spongiosis, acanthosis,
hyperkeratosis, and increased number of dermal lymphocytes (Fig. 3). The patient was treated with IV steroids (IV methylprednisolone 0.5 mg/kg daily), azithromycin, and topical tacrolimus. A strict, low phenylalanine diet was started with a phenylalanine intake not exceeding 400 mg/day. IV steroid was tapered, and the patient was discharged with topical tacrolimus and dietary treatment only. Owing to good compliance with the diet, the plasma phenylalanine concentration dropped to 450 lmol/L in one month; tacrolimus was stopped one month later. After six months of dietary treatment, we observed an almost complete cutaneous response with regression of erythematous lesions and itching (Figs. 1b and 2b), together with a reduction of IgE (2712 kU/L) and eosinophil value (0.7 9 109/L). This case could be considered as a PKU-related eczema but also a true extrinsic atopic dermatitis. Its peculiarity is represented by the surprising long-lasting clinical response to the dietary regimen. The report by Riva et al. demonstrates that IgE levels are higher in patients with PKU than in the normal population and suggests that a dietary regimen can control the development of immunoallergic signs and symptoms.11

Our report confirms that dietary regimen could not only avoid mental retardation in childhood but also reduce the incidence of cutaneous manifestations in PKU. This evidence can also provide an explanation to the reduced incidence of eczema in the patient with PKU observed in the last years.

References

Figure 1 Clinical picture of the patient before (a) and 6 months after (b) phenylalanine-restricted diet

Figure 2 Clinical picture of the patient before (a) and 6 months after (b) phenylalanine-restricted diet

Figure 3 Skin biopsy shows spongiosis, acanthosis, hyperkeratosis, and increased number of dermal lymphocytes (hematoxylin and eosin, 9100)