Published in final edited form as:

J Inherit Metab Dis. 2018 March ; 41(2): 279–280. doi:10.1007/s10545-017-0102-y.

Skin lesions in a patient with Cobalamin C disease in poor metabolic control

Pankaj Prasun¹, Cristel Chapel-Crespo¹, Amy Williamson¹, Paul Chu², Kimihiko Oishi¹, and George Diaz¹

¹Department of Genetics and Genomic Sciences, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place - Box 1497, New York, NY 10029, USA

²DermPath Diagnostics, Port Chester, NY, USA

Skin lesions (Fig. 1a) of an 8 year old boy with cobalamin C disease. The diagnosis of cobalamin C disease was confirmed by molecular studies (homozygous pathogenic mutation, **c.567dupT** in *MMACHC* gene) after newborn screen showed elevated C3. Treatment with betaine, hydroxocobalamin, and leucovorin was initiated soon after the diagnosis. However, the patient was poorly compliant. At presentation of these lesions, homocysteine was 181.2 $\mu\text{mol/l}$. Plasma methionine was very low and plasma methylmalonic acid was high (Suppl. Table 1). Patient was on unrestricted diet and his essential amino acid levels were normal (Suppl. Table 2). Home care nursing and school health services were involved to ensure compliance with treatment which consisted of vitamin B12 injections (10 mg/Kg/day intramuscular), betaine (250 mg/Kg in two divided doses), and folinic acid (2.5 mg three times a day). Within a week, lesions improved and healed by 6 weeks. Metabolic parameters showed improving trend with improvement in the lesions (Fig. 1b–d, Suppl. Table 1). Biopsy of a lesion (Fig. 1e) showed acanthosis, spongiosis and perivascular lymphocytic and eosinophilic infiltrates (Fig. 1f).

Cutaneous manifestation is rare in Cobalamin C disease. Two patients with cobalamin C defect presented with diffuse erythema and desquamation resembling acrodermatitis enteropathica (Howard et al 1997). Such lesions have been described in many metabolic disorders (Tabanlioglu et al 2009). Nutritional deficiencies secondary to restricted diet is considered responsible. However, the patients reported by Howard et al did not have nutritional deficiencies and skin lesions resolved with treatment. Underlying metabolic disease rather than nutritional deficiencies was considered the etiology. However, detailed metabolic parameters were not provided.

Correspondence to: Pankaj Prasun.

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s10545-017-0102-y>) contains supplementary material, which is available to authorized users.

Compliance with ethical standards

Conflict of interests P. Prasun, C. Chapel-Crespo, A. Williamson, P. Chu, K. Oishi, and G. Diaz declare that they have no conflict of interest.

Informed consent Informed consent has been taken from the patient guardian for publication in a medical journal and will be provided if needed.

This report is a retrospective clinical observation that does not require ethics committee approval at this institution.

Vitamin B12 deficiency has been associated with cutaneous lesions including atopic dermatitis and aphthous stomatitis (Brescoll and Daveluy 2015). Vitamin B12 was shown to have an anti-inflammatory effect (Yamashiki et al 1992). Hence, it appears that skin lesion in cobalamin C disease is directly related to underlying metabolic defect and not nutritional deficiencies. Appearance of skin lesions should lead to consideration of poor metabolic control due to noncompliance or inadequate doses. A timely diagnosis is essential as these lesions are reversible.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding None.

References

- Brescoll J, Daveluy S. A review of vitamin B12 in dermatology. *Am J Clin Dermatol*. 2015; 16:27–33. [PubMed: 25559140]
- Howard R, Frieden IJ, Crawford D, et al. Methylmalonic acidemia, cobalamin C type, presenting with cutaneous manifestations. *Arch Dermatol*. 1997; 133:1563–1566. [PubMed: 9420542]
- Tabanlıoğlu D, Ersoy-Evans S, Karaduman A. Acrodermatitis enteropathica-like eruption in metabolic disorders: acrodermatitis dysmetabolica is proposed as a better term. *Pediatr Dermatol*. 2009; 26:150–154. [PubMed: 19419460]
- Yamashiki M, Nishimura A, Kosaka Y. Effects of methylcobalamin (vitamin B12) on in vitro cytokine production of peripheral blood mononuclear cells. *J Clin Lab Immunol*. 1992; 37:173–182. [PubMed: 1339917]

Fig. 1. Skin lesion at presentation (a), 1 week (b), 6 weeks (c), and 12 weeks (d) post therapy. Histopathologic (f) analysis of a lesion at presentation (e)