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Intravenous immunoglobulin-induced severe vesicular eczematous eruption successfully treated with narrow band-ultraviolet B therapy

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Abstract

Intravenous immunoglobulins (IVIg) are increasingly being used to treat a wide spectrum of dermatological and neurological autoimmune diseases. Although the administration of IVIg does not usually result in severe adverse reactions, side effects of IVIg reportedly occur in 6–13% of patients. Most reported cases were not severe, and IVIg is considered a relatively safe drug. Some reports described a vesicular eczematous eruption caused by IVIg that was cured by applying topical steroid ointments or systemic steroids. Herein, we present, to the best of our knowledge, the first case of severe vesicular eczematous eruption all over the body induced by IVIg that was unresponsive to topical steroid ointment and was subsequently treated with narrow band-ultraviolet B (NB-UVB) therapy successfully. NB-UVB was started at a dose of 400 mJ/cm^2 once a week, and swift improvement was observed. The skin rash disappeared in the first 2 months, and the pathogenesis of IVIg-induced eczematous eruption remains unelucidated. No change in eosinophils and complement levels were observed in our case. Given the increase in the widespread use of IVIg, we have shown that NB-UVB therapy is a candidate choice for the treatment of IVIg-induced severe vesicular eczematous eruption.

To the Editor:

Intravenous immunoglobulins (IVIg) are increasingly being used to treat a wide spectrum of several dermatological and neurological autoimmune diseases, such as dermatomyositis, Stevens–Johnson syndrome, chronic inflammatory demyelinating polyneuropathy (CIDP), Kawasaki disease, and Guillain–Barre syndrome.[1,2] Although IVIg does not usually cause severe dermatological adverse reactions, some mild cutaneous adverse reactions have been reported.[1-4] Some reports have recorded vesicular eczematous eruptions caused by IVIg that were cured by applying topical steroid ointments or systemic steroids.[1,2] Herein, we present, to the best of our knowledge, the first case of severe vesicular eczematous eruption all over the body induced by IVIg that was refractory to topical steroid ointments and was subsequently treated by narrow band-ultraviolet B (NB-UVB) therapy successfully. The patient provided informed consent for treatment and publishing.

A 57-year-old man presented with muscular weakness and dysesthesia in his fingers and was diagnosed with CIDP. He was treated with a 5-day course of IVIg therapy at the standard dose of 0.4 g/kg/day. After initiation of the therapy, improvement in grip power and decrease in the range of numbness were observed. However, a skin rash appeared approximately 2 weeks after beginning IVIg therapy and spread rapidly throughout the body except for palms and soles (Fig.1a-c). He had no history of allergies. The possibility of viral infections and a drug eruption to some drugs other than IVIg were excluded. A skin biopsy specimen of the lower leg revealed spongiotic dermatitis with a slightly thickened and partially edematous epidermis (Fig.1d). Similarly, the infiltration of eosinophils and lymphocytes was observed (Fig.1d). The result of direct immunofluorescence was negative. Thus, his eruptions were diagnosed as an IVIg-induced vesicular eczematous eruption. IVIg administration was discontinued, and he was treated with antihistamines and topical steroid ointments; however, his symptoms were

70 completely refractory to the various therapies. Subsequently, NB-UVB was started at a dose of
71 400 mJ/cm^2 once a week. Swift improvement was observed, and the skin rash disappeared in the
72 first 2 months (Fig.1e-g).

73 Previous reports on IVIg have detailed that side effects occurred in 6–13% of patients
74 who were administered IVIg. Most reported cases were not severe, and IVIg is considered a
75 relatively safe drug. Although some cases of IVIg-induced eczematous eruption required
76 treatment, topical or systemic steroids were efficient.[1,2] However, our patient experienced a
77 severe vesicular eczematous eruption caused by IVIg, which was unresponsive to topical steroid
78 ointments. He developed the rash 2 weeks after the initiation of IVIg infusion, which was
79 consistent with the findings in previous reports; for example, Cohen et al. described 8.4 days,
80 and Vecchietti et al. described 10 days.[1,2]

81 Earlier reports have revealed that skin tests, such as prick and patch tests, were
82 negative. Thus, the pathogenesis of IVIg-induced eczematous eruption remains unelucidated.[1,3]
83 In our case, no increase in eosinophils and complement levels were observed. Although the
84 reintroduction of IVIg and switching the type of IVIg is a potential consideration,[1] we avoided
85 the re-use of IVIg. NB-UVB therapy is a treatment used for atopic dermatitis, vitiligo,
86 cutaneous T-cell lymphoma (CTCL), and psoriasis; however, to the best of our knowledge, it
87 has never been used for refractory eczema due to IVIg administration.[5]

88 The mechanism underlying the significant effect of NB-UVB therapy on this case that
89 was unresponsive to topical steroids remains unknown. However, several studies have revealed
90 this significant effect of NB-UVB therapy on skin diseases such as chronic eczema and pruritic
91 papular eruption that were unresponsive to topical steroids.[6,7] Several mechanisms for NB-UVB
92 therapy have been reported.[7-10] Namely, NB-UVB-induced immune modulation is reportedly
93 associated with upregulated anti-inflammatory cytokines such as IL-10, and also increases in

regulatory T cells.[7-10]

Given the widespread use of IVIg treatment, we deem NB-UVB therapy a novel candidate that could be used to treat IVIg-induced severe vesicular eczematous eruption.

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Figure legends

Figure 1. Clinical and histopathological features in the patient.

(a) Erythema with red papules on the abdomen and the upper extremities before narrow band-ultraviolet B (NB-UVB) treatment. **(b)** Erythema with red papules on the back before NB-UVB treatment. **(c)** A palm-sized, scaling, erythematous plaque with red papules on the lower extremities before NB-UVB treatment. **(d)** Histopathological analysis of the biopsy specimen of the skin lesion on the right lower leg showed slightly thickened and partially edematous epidermis with spongiosis formation. Infiltration of eosinophils and lymphocytes was observed mainly around blood vessels in the superficial dermis. (hematoxylin and eosin stain; original magnification: ×20, bar=50 μm). **(e–g)** All cutaneous lesions disappeared from the abdomen and the upper extremities (e), the back (f) and the lower legs (g) after 2 months of treatment with NB-UVB irradiation.

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Figure1, Koizumi et al.