

Case Report

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Successful Treatment of Multiple Alopecia Areata With Contact Immunotherapy: Supportive Usage of Oral Antihistamine and Topical Corticosteroid

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ABSTRACT

Contact immunotherapy using diphenylcyclopropenone (DPCP) is a commonly used first-line therapeutic technique for patients with alopecia areata (AA). We present here a successful immunotherapy for AA female case with atopic diathesis, using oral antihistamine and topical corticosteroid supportively on DPCP. Courses of clinical and laboratory findings suggested that indirect effect to allergic inflammation by antihistamine drugs contributed to AA regression in our case.

KEY WORDS: Alopecia areata; Atopic dermatitis; Contact immunotherapy.

ABBREVIATIONS: DPCP: Diphenylcyclopropenone; AA: Alopecia Areata; AD: Atopic Dermatitis; UV: Ultraviolet; PUVA: Phototherapy ultraviolet radiation; UVB: Ultraviolet B.

INTRODUCTION

Alopecia areata (AA) is a most common cause of hair loss,¹ characterized by patchy, confluent, or diffuse hair loss in normal-appearing skin. Area of hair loss usually involve in the scalp and region of the beard, or even on the whole body. Together with clinical presentation of hair-loss, exclamation-mark hairs, cadaver hairs and nail pitting often render the diagnosis of AA.¹ About 16% of AA patients are reported to associate with other allergic or autoimmune diseases including atopic dermatitis (AD), vitiligo, autoimmune thyroid disease.^{2,3} Helpful therapeutic options with immunosuppressive or immune-deviation strategy are suggested to clinician on these days.¹ Among them, only 2 treatments are considered to reach the level of evidence-based medicine; intralesional injection of corticosteroid and contact immunotherapy.^{1,4-6} Still, there is no curative therapy for AA. On the other hand, 'modified' immunotherapy for AA such as combination therapy with contact immunotherapy and steroid pulse and contact immunotherapy without sensitization at a starting point are also reported, currently.⁷

We experienced promoted hair regrowth in refractory multiple AA after the combination therapy of contact immunotherapy using diphenylcyclopropenone (DPCP) with oral bepotastine besilate, oral hydroxyzine hydrochloride and intermitted application of topical corticosteroid.

CASE REPORT

A female case, with a history of polycystic kidney and AD from 27-years-old, experienced onset of AA when she was 40 years old. She has not responded to steroid pulse therapy for one year of intermittent (weekend) oral corticosteroid with targeted ultraviolet (UV) B phototherapy for her scalp. She visited our hospital in 2015, when she was 47-years-old. She neither responded

to 6 months of weekend oral corticosteroid with topical phototherapy ultraviolet radiation (PUVA) for her head, nor 6 months of oral antihistamine and intralesional corticosteroids with ultraviolet B (UVB) irradiation for her body in our hospital. After tapering oral corticosteroid, we began biweekly contact immunotherapy using DPCP on 2016. Simple application of 10⁻⁸10⁻⁷% DPCP for 3 months aggravated her skin especially in her hairy scalp, ears, face and neck. Hairs of parietal region remained to be completely lost after 3 months of biweekly contact immunotherapy (Figure 1). However, it showed remarkable recovery not only of eczema of her body but also of hair growth after double dose of oral bepotastine besilate (40 mg/day), hydroxyzine hydrochloride (20 mg/day) and topical corticosteroid lotion were added (Figure 2). Application of topical corticosteroid was only

permitted in last three days before the day of DPCP application. Changes in laboratory data were shown in Table 1.

DISCUSSION

Inducing allergic reaction by applying contact allergens to the affected skin is a principle of contact immunotherapy.⁷ Among several reported prognostic factors of contact immunotherapy until today, AD is not a negative factor for DPCP.⁸ We have decided to start the therapy on this case because firstly depend on patient's strong will, secondly depend on this note described above, in spite of concerned aggravation of AD eczema by excessive allergic reaction. Combinative use of oral antihistamine and topical corticosteroid, aimed to cure worsen AD skin symp-

Figure 1: After 3 Months of DPCP Therapy. Parietal Area of Hair Loss of the Scalp Reached About 70% of the Scalp.



Figure 2: After 10 Months of DPCP with Oral Antihistamine and Topical Corticosteroid. AA Patch Nearly Recovered. The Combination Therapy is Being Continued Until Now.



Table 1: Laboratory Data of the Year 2015-2016. Thymus and Activation-Regulated Chemokine (TARC) was Decreased whereas Serum Immunoglobulin (Ig) E and Eosinophil Level Showed no Remarkable Changes.

| Date | Therapy | TARC (-450 pg/mL) | IgE (-500 IU/mL) | Eosinophil (70-440 / μ L) |
|-----------|--|----------------------|---------------------|----------------------------------|
| Jan. 2015 | Weekend oral corticosteroid | | 517 | 461 |
| Aug. 2015 | UVB Antihistamine Intralesional corticosteroid Weekend oral corticosteroid | 2416 | 651 | 600 |
| Dec. 2016 | DPCP Antihistamine (4 months after changing to bepotastine besilate and hydroxyzine hydrochloride) Topical corticosteroid | 985 | 588 | 575 |

TARC: Thymus and Activation-Regulated Chemokine; DPCP: Diphenylcyclopropanone; UVB: Ultraviolet B.

toms with this case, were casually started, though we principally stop using oral antihistamine at the beginning of contact immunotherapy in order to induct sufficient contact dermatitis by the therapy in our hospital. Supplementary effects of second-generation antihistamine such as fexofenadine and ebastine are previously reported.⁹⁻¹¹ Among them, Inui et al presented the effect of fexofenadine in 121 cases of contact immunotherapies on AA patients. AA patients with atopic diathesis treated with fexofenadine showed marked hair regrowth than AA patients with atopic diathesis untreated with fexofenadine.¹⁰ Interestingly, there has been reported no difference in hair regrowth between AA patients with or without fexofenadine therapy, who had no atopic diathesis. They concluded that combination therapy of fexofenadine with contact immunotherapy is helpful option in the treatment of AA with atopic diathesis. Our case showed remarkable and sudden hair recovery after new generation antihistamine drugs and topical corticosteroid were added to simple DPCP therapy. These results bring us insights that antihistamine could have contributed to hair growth *via* indirect effect through improvement of allergic inflammation. According to the data (Table 1), thymus and activation-regulated chemokine (TARC) was decreased whereas serum immunoglobulin E level and eosinophil level were not influenced by this treatment modality. Her skin symptom are being still fluctuated and managed to control with topical corticosteroid and moisturizer as well.

We also suspect intermitted using of topical corticosteroid contributed controlling inflammatory cell infiltration and promoting recover from erosive dermatitis commonly which is common complication of contact immunotherapy. We suggest that usage of topical corticosteroid shouldn't be eliminated in contact immunotherapy on AA patients with atopic diathesis such as AD. Ohyama et al reported that there were not statistically significant difference in serum levels of IL-12 and substance P, but there were decreased infiltrating T-cells around follicles were seen pathologically in local skin with AA patch of ebastine-treated C3H/HeJ litter mice. In their report, they speculated antihistamine modulate local behaviors of mast cells in AA.¹¹ Our case in this report also suggests that TARC derived from keratinocytes at a local skin with AA patch directly accelerated hair fall. Among AA as multifactorial disease, we consider susceptibility to contact immunotherapy in AA with atopic diathesis may depend on severity of AA.

CONCLUSION

As far as we are aware, this is a first report that bepotastine besilate and hydroxyzine hydrochloride showed beneficial effect in an AA patient with AD undergoing contact immunotherapy. Effective and capable combinative options with contact immunotherapy such as anti-allergic inflammation drugs are required for AA patient with AD.

CONFLICTS OF INTEREST

The authors have no conflict of interest to declare.

CONSENT

The authors have received oral informed consent from the patient whose photographs are involved in the manuscript.

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