

## CONFLICTS OF INTEREST

The authors have nothing to disclose.

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# Influence of Weight Loss on Severity of Atopic Dermatitis in a 20-Year-Old Female with Atopic Dermatitis

Jee Hee Son\*, Bo Young Chung\*, Min Je Jung, Yong Won Choi, Hye One Kim, Chun Wook Park

*Department of Dermatology, Kangnam Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea*

Dear Editor:

A 20-year-old female patient had atopic dermatitis (AD) from her second year. She had been treated with antihistamine, and with topical steroid and calcineurin inhibitor, for about one year. Four months ago, her symptoms got worse. At first visit, her body mass index (BMI) was 26.81 kg/cm<sup>2</sup> (73 kg, 165 cm), waist circumference was 82 cm, Eczema Area and Severity Index (EASI) score was 16.8, and visual analogue scale (VAS) for pruritus was '7'. Physical examination revealed diffuse erythematous patch-

es and maculopapules with slight crust and scales over her whole body, especially her face, back, and posterior aspects of her thighs (Fig. 1A~E). Symptoms did not improve after cyclosporine (100 mg/d) was given for three weeks. Maintaining existing therapy, she was referred to Family Medicine to manage her obesity. Dietary control and exercise were prescribed. Aerobic exercise of moderate intensity (METs 6~7) was recommended 150 minutes/week. She recorded the quantity, type of exercise, and total daily calorie intake in a diary. One tablet of anti-

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**Corresponding author:** Chun Wook Park, Department of Dermatology, Kangnam Sacred Heart Hospital, Hallym University College of Medicine, 1 Singil-ro, Yeongdeungpo-gu, Seoul 07441, Korea. Tel: 82-2-829-5221, Fax: 82-2-832-3237, E-mail: dermap@hanmail.net  
ORCID: <https://orcid.org/0000-0003-4512-8668>

Hye One Kim, Department of Dermatology, Kangnam Sacred Heart Hospital, Hallym University College of Medicine, 1 Singil-ro, Yeongdeungpo-gu, Seoul 07441, Korea. Tel: 82-2-829-5221, Fax: 82-2-832-3237, E-mail: hyeonekim@gmail.com  
ORCID: <https://orcid.org/0000-0001-5846-0008>

\*These authors contributed equally and should be considered co-first authors.

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**Fig. 1.** A 20-year-old female patient with atopic dermatitis presents diffuse erythematous maculopapular patches with crust and scales. (A) Face, (B) post aspect of thighs, (C) post aspect of lower legs, (D) abdomen, (E) back. After 12 weeks of treatment, skin lesions improved. (F) Face, (G) posterior aspect of lower leg, (H) abdomen, (I) back. We received the patient's consent form about publishing all photographic materials.

obestic drug lorcaserin (10 mg) twice/day was prescribed. After 12 weeks, her BMI was  $20.64 \text{ kg/cm}^2$  (56.2 kg), waist circumference was 65 cm, and symptoms had improved. EASI score was 6.6, VAS was '4', and skin lesions improved (Fig. 1F~I). We received the patient's consent form about publishing all photographic materials. Currently, improved symptoms are maintained only by applying evening primrose oil and tacrolimus ointment. There were no significant differences in eosinophil counts and total immunoglobulin E after 12 weeks (Table 1). Positive studies regarding the association of obesity and

AD in children and adults has been reported<sup>1</sup>. Some studies (including Korean ones) reported that the risk of AD was correlated with increased BMI predominantly in women, especially prepuberal<sup>2,3</sup>. The associative mechanism of obesity with AD remains unknown, but some have been proposed. Polymorphisms of  $\beta$ 2-adrenergic (ADRB2) and glucocorticoid (NR3C1) receptor genes, and fractalkine receptor gene CX3CR1 in asthma, atopy, and obesity could explain a positive relationship between them. Moreover, obesity could affect the immune system via adipokines (e.g., adiponectin and leptin)<sup>4</sup>. Adiponectin

**Table 1.** Changes in severity of atopic dermatitis (EASI), VAS, BMI, waist circumference and laboratory findings during 12 weeks of weight loss

Parameters	Baseline	Week 1	Week 2	Week 4	Week 8	Week 12
EASI score	16.8	12.8	10.4	8.6	8.2	6.6
VAS for pruritus	7	4	3	3	3	4
BMI (kg/cm <sup>2</sup> )	26.81	26.92	24.31	22.50	21.78	20.64
Waist circumference (cm)	82	81	76	74	73	65
WBC (count, ×10 <sup>3</sup> normal range 4.0~10.0)	9.62	-	-	-	-	6.21
Hb (g/dl; normal range 11.0~14.0)	13.2	-	-	-	-	13.9
Total IgE (IU/ml; normal range 0~158)	508.3	-	-	-	-	358.5

EASI: eczema area and severity index, VAS: visual analogue scale, BMI: body mass index, WBC: white blood cells, Hb: hemoglobin, IgE: immunoglobulin E, -: not done.

has anti-inflammatory effect, but leptin has pro-inflammatory effect, regulating cytokines, circulating monocytes, natural killer cells, and the polarization of CD4<sup>+</sup> and CD8<sup>+</sup> T cells<sup>4</sup>. Reduced adiponectin caused inflammation with increased eosinophils and influenced the occurring allergic march<sup>4</sup>. Obesity could also influence sex hormones<sup>2,5</sup>. Increased estrogen stimulated interleukin (IL)-3 and IL-4 in monocytes and promoted a Th2 phenotype immune response<sup>2</sup>.

In a previous study, patients showed significantly higher EASI scores at BMI ≥ 25 kg/cm<sup>2</sup> than at BMI < 25 kg/cm<sup>2</sup> (only in pre-adult-onset adult AD)<sup>3</sup>. These results suggest the severity of AD is associated with obesity although causality is unknown. Some studies reported obese patients with psoriasis improved after weight loss. However, in the field of AD, studies on the effect of weight loss are limited. Our case suggests weight loss could improve the symptoms and status of AD. Further randomized studies with a large number of patients are warranted to confirm the significant relation between obesity and AD.

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## CONFLICT OF INTEREST

The authors have nothing to disclose.

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