Case Report
Olgu Sunumu

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Dupilumab combined with a short-term narrowband-ultraviolet B phototherapy in a pediatric case of severe atopic dermatitis

Şiddetli atopik dermatitli pediatrik hastada dupilumab ve dar bant ultraviyole B fototerapi kombinasyonu

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Abstract

Recently, dupilumab treatment in atopic dermatitis (AD) has been an effective and safe option in terms of adverse effects. However, combination therapies can sometimes be better at increasing efficacy or reducing adverse effects or cumulative doses. Early combination therapies may be more rational, especially considering that dupilumab treatment alone is less effective and has a late-onset efficacy. Here, we discussed dupilumab and a short-term narrowband ultraviolet B combination therapy in a child with AD.
Keywords: Atopic dermatitis, dupilumab, narrowband UVB

Öz

Son yıllarda atopik dermatitte (AD) dupilumab tedavisi, oldukça etkin ve yan etkileri açısından oldukça güvenli bir seçenek sunmaktadır. Yine de bu kronik hastalıkta bazen kombinasyon tedavileri ile etkinlik artırılması ya da yan etkiler ve kümülatif dozun azaltılmasına ihtiyaç olabilir. Özellikle dupilumabın likenifiye lezyonlarda etkinliğinin daha az ve geç başladığı göz önüne alındığında erken dönemdeki kombinasyon tedavileri daha akılcı olabilir. Burada, dupilumab başladığımız bir AD'li çocukta, kısa süreli dar bant ultraviyole B kombinasyon tedavisini tartıştık.
Anahtar Kelimeler: Atopik dermatit, dupilumab, dar bant UVB

Introduction

Dupilumab has been recently approved by the Food and Drug Administration for use in children aged 6-12 years with atopic dermatitis (AD). Although the combination treatment of dupilumab with topical steroids is well known, other combination options have yet to be established[1]. In a very recent study, dupilumab combined with methylprednisolone, cyclosporine, methotrexate, and narrowband ultraviolet B (NB-UVB) treatment was found effective without any adverse effects in adults with AD[2].

Here, we presented a pediatric patient with severe AD treated with dupilumab combined with a short course of NB-UVB phototherapy.

Case Report

A 9-year-old girl presented with severe itching and widespread eczematous lesions. Her AD was diagnosed at the age of four months. Dermatologic examination revealed widespread eczematous lesions with secondary impetiginized areas, excoriations, vesiculations and erosions, and severe lichenified plaques on the neck, flexor aspects of the knees, ankles, elbows, and wrists consistent with acute and chronic eczematous changes (Figure 1, 2). Eczema Area and Severity Index (EASI) score was 83. Nails, hair, and oral mucosa were all normal. Her height and weight are in the 10-25 percentile. The mother denied any history of recurrent and/or severe skin and systemic infections.

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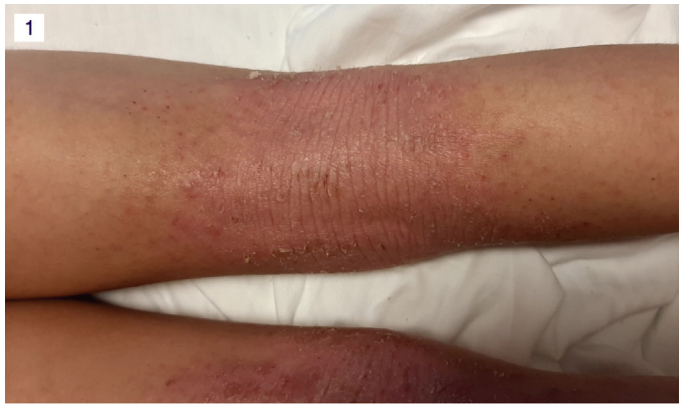
Previous treatments included intermittent systemic steroids, topical corticosteroids, and calcineurin inhibitors with a partial response and rapid recurrences. She was treated with cyclosporine for a total of nine months, three and five years ago.

Complete blood count was normal except for the increased eosinophil count (29% with an absolute count of 1780/mm^3). Results of detailed biochemistry and viral serology tests, as well as parasitic examinations, were all normal or negative. Total immunoglobulin E (IgE) level was 26157 IU/mL. Bacterial cultures from both eczematous areas and intranasal swabs showed methicillin-sensitive *Staphylococcus aureus* (MSSA). Allergen-specific IgE antibody respiratory and food panel showed high sensitivity to mixed grass and tree pollens, epithelial and feather mix, nuts, wheat, cacao, and egg white. IgG, IgA, and IgM levels with specific antibody for respiratory response and results from a subgroup analysis of lymphocytes to exclude primary immune deficiency disorders were normal. Punch biopsy showed spongiotic dermatitis with inflammatory infiltration mostly consisting of eosinophils.

When the patient was hospitalized, we started treatment with prednisone [0.5 mg/kg/d (10 mg/d)], cyclosporine (2.5 mg/kg/d), oral antihistamine, wet-wrap treatment with methylprednisolone aceponate, moisturizers, and a restricted diet regulation. We observed partial improvement after two weeks of treatment. In the second month of treatment, we started subcutaneous dupilumab treatment [300 mg (q4w)] and discontinued cyclosporine treatment. We tapered the prednisone dose and then stopped within two weeks. We added NB-UVB treatment (three times/week) for two months after the second dose of dupilumab. At the eighth month of dupilumab treatment, the patient received only topical pimecrolimus (three days/week) with a moisturizer. We found mild lichenification and eczematization on the flexural areas of the knees and elbows (Figure 3, 4) with an EASI score of 3.8. Informed consent was obtained.



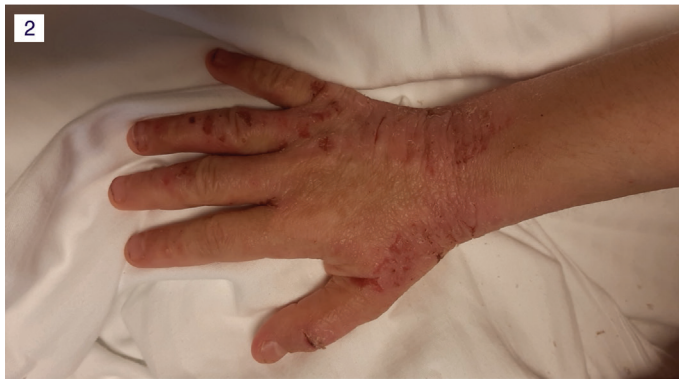


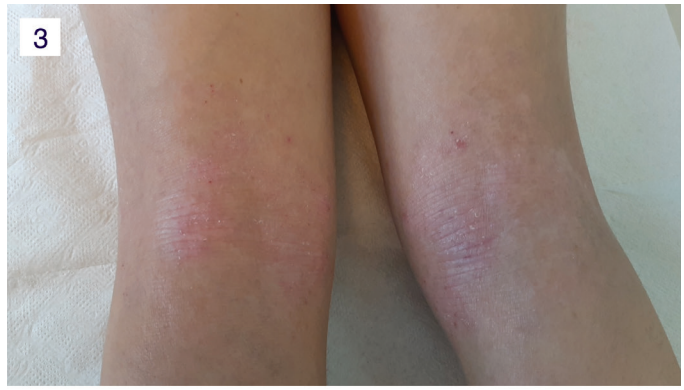
Figure 1, 2. Before treatment, severe eczematization, and lichenification

Discussion

Dupilumab is a novel drug without immunosuppressive adverse effects. It has a synergistic effect with topical steroids. However, data for combination therapy with other medications or treatment methods are currently not enough[1]. Since dupilumab is not photosensitive, combining it with NB-UVB phototherapy without expecting short- and long-term adverse effects is reasonable, considering current data. This combination might be useful in many aspects against severe and treatment-resistant AD.

At the skin level, NB-UVB phototherapy modulates not only the Th2/Th22 but also the Th1/Th17 immune axes[1], which could further improve the treatment of AD. Additionally, phototherapy reduces staphylococcal carriage and/or colonization[3]. Colonization of MSSA on the nose and eczema lesions are common in AD and were also present in our patient.

In a recent study[4], a total of 45 adult patients with AD were divided into two groups. Eighty percent of these patients had used cyclosporine and/or another DMARD in the past. Thirty patients were in dupilumab monotherapy and 15 in the combination therapy with NB-UVB phototherapy (two times/week, for 12 weeks). They were



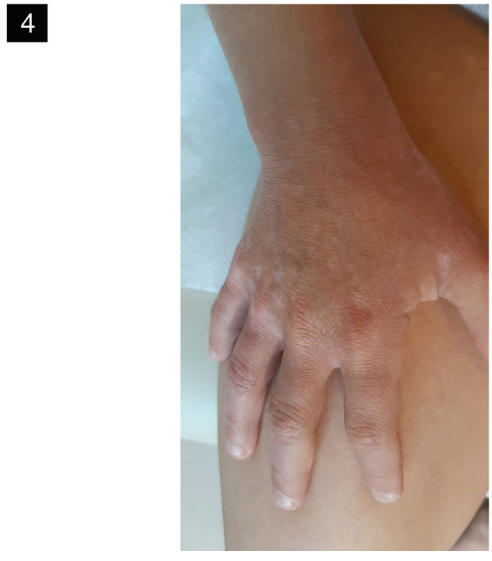


Figure 3, 4. Significant improvement at 8th month of treatment

compared at weeks 0, 4, 12, and 16. The authors stated that patients on dupilumab monotherapy showed improvement after 12-16 weeks whereas those on the combination therapy showed faster clinical improvement after 4 weeks. However, they observed that after 12-16 weeks, the additional therapeutic effect of phototherapy weakened. They concluded that accompanying NB-UVB phototherapy in the first few weeks of dupilumab therapy might provide faster remission in patients with severe AD[4].

As the presented patient had exceptionally severe AD, dupilumab with short-term NB-UVB combination therapy was planned to enhance the efficacy and accelerate clinical improvement. Although previous usage of systemic cyclosporine is a concern for phototherapy, the risk was deemed relatively low in terms of short-term NB-UVB treatment and lower cumulative dosage of cyclosporine.

The combination of NB-UVB phototherapy and dupilumab seems a reasonable option to accelerate healing. Short-term NB-UVB phototherapy might have an initial additive effect to dupilumab therapy and might reduce the cumulative dose for both dupilumab and topical therapies in the long-term period. Additionally, for patients who are reluctant to apply topical therapies, this combination might reduce the requirement and provide an interruption of topical steroids. To our knowledge, this is the first case of pediatric AD treated with combination therapy of dupilumab and NB-UVB phototherapy in English literature. However, the study has some limitations since it is a single case report and lacks long-term follow-up. Closer and long-term follow-up is crucial for the presented patient because of previous cyclosporine usage.

Ethics

Informed Consent: It was obtained.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: A.K., Ç.A., K.Y., Concept: A.K., Ç.A., K.Y., Design: A.K., Ç.A., Data Collection or Processing: A.K., Ç.A., Analysis or Interpretation: A.K., Literature Search: A.K., Writing: A.K., Ç.A.

Conflict of Interest: No conflict of interest was declared by the authors.

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