Acute onset of psoriasis in a patient with atopic dermatitis treated with dupilumab

Running Head: Dupilumab and Psoriasis

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Keywords: atopic dermatitis; dupilumab; psoriasis; drug reaction;

Conflict of interest disclosures: None.

Manuscript word count: 565

Figures count: 2

Atopic dermatitis (AD) is a chronic, multifactorial, inflammatory skin disease which can have a negative impact on the quality of life (QoL). The moderate-to-severe forms frequently require systemic treatment.

Dupilumab is a human monoclonal antibody directed against the alpha subunit of the IL-4 receptor. It has been the first biologic drug that approved for the treatment of moderate to severe AD.

The data available regarding efficacy and safety are from clinical trials.

The literature data show a good safety profile with fewer adverse effects (AEs) recorded in literature, especially regarding ocular involvement.

Here, we report a case of a 42-years-old man who developed psoriasis during dupilumab treatment.

He had atopic dermatitis since his childhood associated with allergic rhinitis and elevated total serum IgEs. No personal or familiar history of psoriasis was reported. Following Hanifin and Rajka clinical criteria and the histological diagnosis of spongiotic dermatitis, we made a diagnosis of severe AD uncontrolled by topical and traditional systemic treatments, including cyclosporine.

He started dupilumab treatment and AD progressively improved. Within 4 weeks of therapy, all clinical scores as well as scales regarding QoL of the patient improved: EASI 7 Vs 43 at baseline, IGA 1 Vs 4 at baseline, DLQI 3 Vs 13 at baseline, POEM 5 Vs 26 at baseline, NRS-itching 4 Vs 10 at baseline, NRS of sleep disturbance 4 Vs 8 at baseline.

He referred to us after three months from the beginning of the treatment due to the sudden onset of erythematous and scaly plaques diffused on the trunk and limbs (Fig.1). A punch biopsy of new a lesion was performed and histological diagnosis of psoriasis was made.

Dupilumab was discontinued and the patient was treated with topical calcipotriene and betamethasone dipropionate foam achieving clinical remission in about 40 days. Only a mild recurrence of AD was noted after 2 months from the withdrawal of dupilumab. As known, AD and psoriasis can be considered two opposite poles of the cutaneous manifestations of T-helper cellular-mediated inflammation: on one side T-helper 1 cascade activation with its correlated cytokines and cells subsets (as Th17, Th22) has a predominant role in the pathogenesis of psoriasis while on the other side T-helper 2 cascade and its cytokines are involved in the pathogenic mechanisms of AD (1).

Psoriasis is considered primarily a Th17-driven disease with increased levels of related interleukins (IL-17A, IL-22 and IL-23), while AD is a Th2 cellular-mediated disease in which predominate IL4 and IL13 citokines that are able to drive the differentiation of IL-4 itself and to produce Th2 cells from naive T cells in all allergic diseases.

Recently, some studies have underlined the negative regulator action of IL-4 on Th1 pathway by reducing IL-23 production (2) and silencing Th17-dominated skin inflammation that, as known, it is predominant in psoriasis.

Consequently, it has been supposed that inhibition of Th2 pathway through blocking IL4 and IL13 signaling could play a role in a shift toward Th1 inflammatory pathway and it may be responsible for the arising of psoriasis in genetically predisposed patients treated with dupilumab (1).
Our case represents one of the few reported clinical cases of psoriasis arising during dupilumab therapy in all the literature (3-5).
To our knowledge, no cases of psoriasis, such as new presentation as well as exacerbation, were recorded during preliminary studies of dupilumab.
Post-marketing surveillance and long-term treatment and monitoring will clarify this possible relationship.

Acknowledgments: None
Conflicts of Interest: None declared.

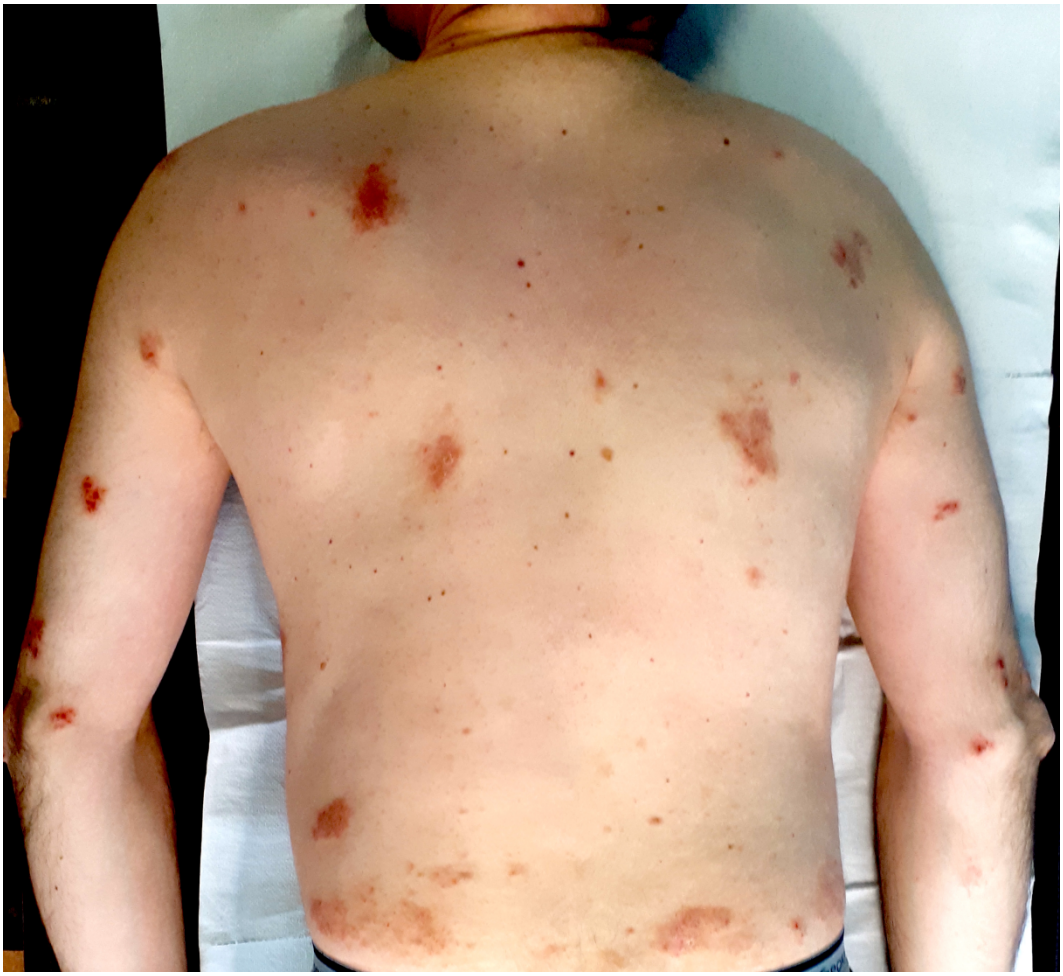
References

1. Guttman-Yassky E, Krueger JG. Atopic dermatitis and psoriasis: two different immune diseases or one spectrum? Curr Opin Immunol. 2017 Oct;48:68-73.
2. Hahn M, Ghoreschi K. The role of IL-4 in psoriasis. Expert Rev Clin Immunol. 2017 Mar;13(3):171-173.
3. Safa G, Paumier V. Psoriasis induced by dupilumab therapy. Clin Exp Dermatol. 2019 Apr;44(3):e49-e50.
4. Tracey EH, Elston C, Feasel P, Piliang M, Michael M, Vij A. Erythrodermic presentation of psoriasis in a patient treated with dupilumab. JAAD Case Rep. 2018 Aug 15;4(7):708-710.
5. Gori N, Caldarola G, Pirro F, De Simone C, Peris K. A case of guttate psoriasis during treatment with dupilumab. Dermatol Ther. 2019 Sep;32(5):e12998.

Figure legend

Figure 1. Cutaneous lesions of atopic dermatitis showed by the patient at the beginning of treatment with dupilumab

Figure 2. Multiple erythematous and scaly plaques on the trunk arising after three months from the beginning of therapy with dupilumab



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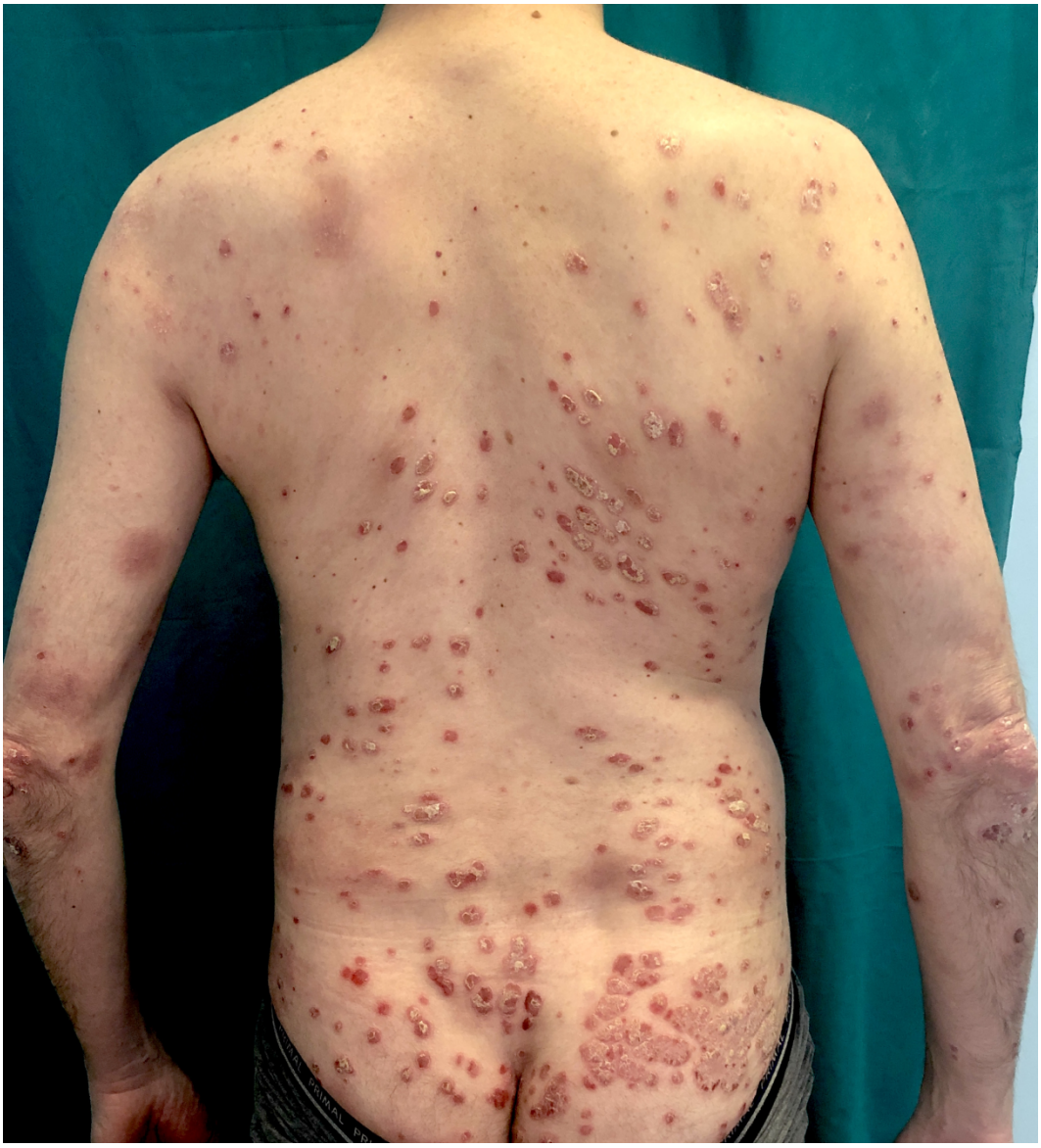

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