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<https://doi.org/10.1016/j.jaad.2018.12.041>

A retrospective review of dupilumab for atopic dermatitis patients with allergic contact dermatitis



To the Editor: Allergic contact dermatitis (ACD) is a delayed hypersensitivity reaction with increased incidence in patients with atopic dermatitis (AD). In studies examining the pathogenesis of AD, the T-cell helper 2 (T_H2) and T_H22 pathways have predominantly been identified, with the T_H17 and T_H1 cells contributing as well.¹ Other studies have

shown a role for similar cytokines in ACD (interferon γ , interleukin [IL] 5, IL-9, IL-10, IL-13, and IL-22), with the response varying by allergen.^{2,3}

Dupilumab, a monoclonal antibody against the α subunit of the IL-4 receptor, is approved for the treatment of moderate-to-severe AD. It is unknown whether dupilumab will have efficacy in those who have AD with overlying ACD. The purpose of this study was to evaluate the response to dupilumab in these patients.

A retrospective chart review was performed on patients prescribed dupilumab at Tufts Medical Center. We collected information about demographics, diagnosis, treatments, and disease progression during 2017-2018. We excluded patients with diagnoses other than AD and a lack of follow-up information. Of the 126 patients prescribed dupilumab, only 64 patients qualified for inclusion. An analysis was performed with the following patient subsets: those with ACD confirmed by patch testing (n = 17), ACD suspected on the basis of clinical findings (n = 14), and ACD not suspected (n = 33).

Table I summarizes the demographics and dupilumab responses. Overall, an average of 4 different therapies failed before the patients were

Table I. Patient descriptions and dupilumab responses

Category	ACD confirmed	ACD suspected	ACD unsuspected
Demographics	n = 17	n = 14	n = 33
Sex, n			
Male	5	8	20
Female	12	6	13
Age, y, mean \pm SD	44 \pm 18	44 \pm 21	46 \pm 19
Race/ethnicity, n			
White, non-Hispanic	10	6	15
Black, non-Hispanic	1	3	3
Hispanic	0	0	4
Asian	5	3	10
Unknown/other	1	2	1
IGA response	n = 14	n = 11	n = 21
Average initial IGA (0-4)	3.2 \pm 0.7	3.3 \pm 0.5	3.4 \pm 0.8
Average final IGA (0-4)	1.1 \pm 1.2	1.2 \pm 1.3	1.9 \pm 1.3
% with final IGA of 0 or 1	57	73	48
% with improving IGA	79	73	86
BSA response	n = 16	n = 10	n = 28
Initial BSA involvement, %	32 \pm 29	43 \pm 37	18 \pm 22
Final BSA involvement, %	3 \pm 8	7 \pm 13	4 \pm 7
% with improving BSA	82	83	83
Average % change in BSA	71 \pm 42	69 \pm 39	52 \pm 73
Pruritus response, %	n = 13	n = 12	n = 25
Resolved	23	33	24
Improved	100	100	92
Not improved	0	0	6

ACD, Allergic contact dermatitis; BSA, body surface area; IGA, Investigator's Global Assessment; SD, standard deviation.

given dupilumab; these therapies included phototherapy, immunosuppressants, and steroids. After treatment, patients with confirmed or suspected ACD had similar reductions in body surface area involvement, Investigator's Global Assessment, and pruritus compared with those unsuspected of having ACD.

The Investigator's Global Assessment scores improved for patients with confirmed ACD (from 3.2 to 1.1), suspected ACD (from 3.3 to 1.2), and unsuspected ACD (from 3.4 to 1.9). The number of patients with a final Investigator's Global Assessment of 0 or 1 was 8 of 14 for confirmed ACD, 8 of 11 for suspected ACD, and 10 of 21 for unsuspected ACD. Similar improvements were seen in body surface area scores; values decreased from 32% to 3% for confirmed ACD, 43% to 7% for suspected ACD, and 18% to 4% for unsuspected ACD. All patients but 2 in the unsuspected ACD group saw improvement of pruritus.

We did not detect a difference in dupilumab response rates between AD patients with and without ACD. In a study involving 6 ACD patients, immunohistochemical analysis revealed IL-4 receptor α -chain immunoreactivity in all patients.⁴ Another study showed IL-4 mRNA levels were increased >5-fold in 50 out of 56 ACD patients.⁵ Therefore, IL-4 and IL-13 might be important cytokines in patients with ACD, and dupilumab could be reducing symptoms through its targeting of IL-4. Another possibility is that treatment of the underlying AD improves barrier function and reduces patient susceptibility to allergens.

This study is limited by its small sample size (64 patients), use of a single center for data, and retrospective nature. It is possible that the study failed to detect a true difference in response rates. Furthermore, we did not examine dupilumab's role in modulating ACD severity and frequency in AD patients. Prospective studies with a larger data set

would help investigate dupilumab as a treatment option for AD patients with ACD.

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Funding sources: None.

Conflicts of interest: Dr Rosmarin serves as a consultant to Regeneron, Pfizer, Abbvie, Janssen, Celgene, Dermavant, and Novartis and is on the speaker's bureau for Regeneron, Sanofi, Pfizer, Abbvie, Janssen, Celgene, Novartis, and Eli Lilly. All other authors have no conflicts of interest to disclose.

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