Atopic dermatitis patient perspectives on dupilumab therapy during the COVID-19 pandemic: an international survey study

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To the Editor:

The degree to which dupilumab therapy may impact SARS-CoV-2 infection susceptibly or COVID-19 clinical outcomes in patients with atopic dermatitis remains uncertain. Furthermore, there is a paucity of studies examining patient perspectives of dupilumab therapy during the COVID-19 pandemic. We conducted an international survey-based study of atopic dermatitis patient perspectives on dupilumab therapy. Survey dissemination occurred through the Amazon Mechanical MTurk platform. Inclusion criteria were age ≥18 years old, self-reported AD diagnosis, and history of dupilumab utilization. Distribution of survey responses amongst participants was the primary study outcome. Of 1,733 respondents, 43 met inclusion criteria. The majority of queried participants were comfortable with dupilumab therapy during the COVID-19 pandemic. Most participants did not report growing concern for treating their AD with dupilumab. Similarly, most participants demonstrated views that are in line with current guidelines regarding the safety of immunosuppressant use during the pandemic. Continued study of different patient populations regarding perspectives of biologic therapies for dermatologic disease can help inform best approaches to patient care during the COVID-19 pandemic.

Atopic dermatitis (AD) may increase SARS-CoV-2 infection susceptibility, although this is debated [1,2]. Dupilumab is a biologic agent indicated for moderate-to-severe AD whose therapeutic effects chiefly rely on Th2 inflammatory pathway suppression [3]. Whether dupilumab independently increases SARS-CoV-2 infection susceptibility or COVID-19 severity remains controversial [3]. Moreover, there is a paucity of studies assessing patients' perspectives of dupilumab treatment during the COVID-19 pandemic. Using a survey-based design, we investigated AD patient opinions on dupilumab treatment during the COVID-19 pandemic.

The study was approved by the Wake Forest University School of Medicine Institutional Review Board. The survey was constructed on REDCap and disseminated through Amazon Mechanical MTurk (survey script available upon request). Survey questions were developed through expert opinion, including questions pertaining to dupilumab suitability in specific clinical scenarios outlined in American Academy of Dermatology (AAD) guidelines (last updated October 2020) on immunosuppressant utilization during the COVID-19 [4]. Inclusion criteria were age ≥18 years old, self-reported AD diagnosis and history of dupilumab

utilization. Patients were excluded if they endorsed a concurrent psoriasis diagnosis, noted no prior dermatology consults or answered incorrectly on an unrelated filter question. Responses were descriptively analyzed (**Table 1**). Associations between socio-demographics and responses were investigated using Chi-square or Fisher exact testing, where appropriate.

Of 1,733 respondents, 43 met inclusion criteria. The majority of included patients were under 40 years old, white and from the United States (**Table 2**). Most queried patients preferred dupilumab educational resources from their physicians; only a minority reported social media or the news (N=5; 11.63%) as their preferred educational source. Over the course of the pandemic, concern regarding dupilumab utilization did not grow amongst the majority of surveyed patients (N=30; 69.77%). Of the 24 patients indicating no change in level of concern, 14 (58.33%), 10 (41.67%), and 0, qualified their concern as low, moderate, and high, respectively. Although most patients discussed risks/benefits of dupilumab during COVID-19 with their dermatologist, a notable minority was either unsure or did not report such

Table 2. *Sociodemographic and other traits of study sample.*

Variable	Frequency	Percentage
Age		
18-40	36	83.72
≥41	7	16.28
Gender		
Female	23	53.49
Male	19	44.19
Other	1	2.33
Race		
White	20	58.14
Non-White*	23	37.21
Not disclosed	2	4.65
Ethnicity		
Hispanic	8	18.60
Non-Hispanic	28	65.12
Not disclosed	7	16.28
Highest degree		
High school or less	5	11.63
University or college	34	79.07
Post-graduate	4	9.30
Household income		
<75,000	32	74.42
≥75,000	11	25.58
Insurance		
Private	23	53.49
Public	18	41.86
Uninsured	2	4.65
Country of residence		
USA	25	58.14
Other#	18	41.86
Familiarity with medical terminology		
Familiar	16	37.21
Somewhat familiar	24	55.81
Not familiar	3	6.98

**includes Asian, African-American or Black, Multiracial.*
#includes India (N=6), Italy (N=5), Brazil (N=2), Canada (N=2), France (N=1), Pakistan (N=1), Spain (N=1).

discussions (N=17; 39.53%). Similarly, a notable minority discontinued the drug without consulting their dermatologist (N=6; 13.95%). On average, most patients reported moderate to high knowledge regarding dupilumab (N=30; 69.77%); the majority of respondents answered four (57.14%) scenarios in accordance with current guidelines on immunosuppressant utilization during the COVID-19 pandemic. There were no associations between self-reported level of dupilumab knowledge and answer selections on scenarios (Fisher exact P≥0.122 for all). No consistent associations between response distributions and socio-demographics emerged.

Most queried AD patients with dupilumab experience appeared to be comfortable with dupilumab treatment during the COVID-19 pandemic. Similar to psoriasis patients on biologics [5], most AD patients from our cohort preferred receiving dupilumab information from their physicians. Preliminary evidence indicates that dupilumab likely does not increase risk of SARS-CoV-2 infection susceptibility or COVID-19 morbidity [3]. The AAD and other regulatory bodies note dupilumab should not be contraindicated in healthy AD patients negative for the SARS-CoV-2 virus [3,4]. Although discontinuing dupilumab once infected with COVID-19 may be recommended, there is insufficient evidence to know whether discontinuing treatment would reduce or exacerbate the risk of poor outcome.

Limitations include self-reported AD diagnosis and relatively small sample size. AD patients without a dupilumab history were excluded thus limiting assessment of dupilumab naïve patients' perspectives. Larger studies can further our understanding of AD patient perspectives regarding dupilumab therapy in the context of the COVID-19 pandemic.

Conclusion

In this study conducted during the COVID-19 pandemic, AD patients were largely comfortable with dupilumab therapy. This may relate to a relatively well-informed study sample on dupilumab safety and COVID-19. Future studies in different populations can be helpful in guiding best practice strategies for patient education on dupilumab therapy during the COVID-19 pandemic.

Potential conflicts of interest

Dr. Feldman has received research grants from Lilly, Abbvie, Janssen, Pfizer, Almirall, and Galderma; speaking honoraria from Lilly, Abbvie, Janssen, Alvotech, Amgen and Sun; consulting fees Abbvie, Janssen, Alvotech, vTv, BMS, Samsung, Pfizer, Boehringer, Dermavant, Arcutis, Novartis, UCB, Helsinn, Sun, Almirall, Leo, Mylan, Forte, TwoXar, and Arena. He holds stock/ownership of DrScore.com and Causa Research. The remaining authors have no conflicts of interest to disclose.

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Table 1. *Patient knowledge and perspectives on dupilumab treatment during COVID-19 pandemic.*

Variable	Frequency	Percentage
Understanding of dupilumab risks/benefits during COVID019		
None-low	13	30.23
Moderate	21	48.84
High	9	20.93
Preferred educational source		
AAD	1	2.33
Family/friends	2	4.65
Pharmaceutical industry	6	13.96
Dermatologist	18	41.86
Non-dermatologist physician	4	9.30
NEA	4	9.30
News	1	2.33
Social media	4	9.30
Research studies	2	4.65
Did not search for sources	1	2.33
Since the beginning of the pandemic my concern about taking dupilumab		
Decreased	6	13.96
Remained the same	24	55.81
Increased	13	30.24
Discuss risks of dupilumab during COVID-19 with dermatologist		
No	8	18.60
Unsure	9	20.93
Yes	26	60.47
Dupilumab effect on COVID-19 outcomes		
Increases odds of worse outcomes	14	32.56
No impact on outcomes	19	44.19
Increases odds of better outcomes	10	23.26
Discontinued dupilumab		
Yes, with dermatology consultation	10	23.26
Yes, without dermatology consultation	6	13.95
No	27	62.79
Scenario 1		
True	9	20.93
False*	34	79.07
Scenario 2		
True*	37	86.05
False	6	13.95
Scenario 3		
True*	17	39.53
False	26	60.47
Scenario 4		
True*	18	41.86
False	25	58.14
Scenario 5		
True*	35	81.40
False	8	18.60
Scenario 6		
True*	34	79.07
False	9	20.93
Scenario 7		

True*	21	48.84
False	22	51.16

AAD, American Academy of Dermatology; NEA, National Eczema Association.
[*]Although there is no absolute correct answer, as per AAD recommendations on immunosuppressive therapy, the marked scenario answer choice is most likely to be recommended given the relevant clinical information.
Scenario 1: It is my understanding that if I am currently on Dupixent (dupilumab) and test negative for COVID-19, I should stop taking Dupixent (dupilumab).
Scenario 2: It is my understanding that if I am currently on Dupixent (dupilumab) and have no signs/symptoms of COVID-19, I should continue taking Dupixent (dupilumab).
Scenario 3: It is my understanding that if I am currently on Dupixent (dupilumab) and test negative for COVID-19, but show signs/symptoms of COVID-19, I should stop taking Dupixent (dupilumab).
Scenario 4: It is my understanding that if I am currently on Dupixent (dupilumab) and test positive for COVID-19 but have no signs/symptoms, I should stop taking Dupixent (dupilumab).
Scenario 5: It is my understanding that after completely recovering from COVID-19 infection I can continue or start taking Dupixent (dupilumab).
Scenario 6: It is my understanding that atopic dermatitis patients who are deemed low-risk for COVID-19 complications and are otherwise appropriate candidates for Dupixent (dupilumab) can start taking Dupixent (dupilumab).
Scenario 7: I think that atopic dermatitis patients who are deemed high-risk for COVID-19 and otherwise appropriate candidates for Dupixent (dupilumab) should consider having Dupixent (dupilumab) initiation delayed.