

before the pandemic; and 81 (81/235; 34.5%) to regularly practice TD, for first visits and follow-up (50/235 = 21.3%) or only for follow-up (31/235 = 13.2%). The approximate percentage of patients visited before the pandemic with TD was <10% for the majority of respondents, mainly visited asynchronously with a store and forward modality. The great majority of doctors (88.2%) registered an increase in the demand for TD during the pandemic.

Among those who did not practice TD before COVID-19 ($n = 199/434$; 45.9%), 72.9% (145/199) declared to have started to practice it during the pandemic.

The main mode of TD during the pandemic was via telephone call (67.9%) alone or in combination with a store and forward (51.1%) and live interactive modality (41.1%). Acute inflammatory conditions were the main reason for consultation (32.8%).

There was a high variability in the platforms used, with 'informal' platforms (Skype, Zoom, WhatsApp) being the most frequently chosen (49.0%). 39% declared to use a dedicated secure hospital platform.

We asked to those who did not use TD, which was the main reason why the majority had a scarce opinion of this modality of consultation, which was judged not to be adequate to make a diagnosis by 33.3% of responders (14/42); others prefer to visit patients face by face (31%; 13/42).

32% of doctors changed their attitudes towards TD; they started TD during the pandemic and found it effective; 47% were already convinced about its utility.

In summary, in times of COVID-19 dermatology surfs the web. As highlighted by the results of this survey, many dermatologists experienced TD for the first time because of the need of social distancing and found it effective, thus reducing the number of face to face consultation and the number of accesses to the ambulatories. The efficacy of TD was already known and demonstrated by many publications; however, sometimes an epochal event is needed to speed up a process.⁴⁻¹⁰ The further steps could be re-thinking dermatological care in a more sustainable way, for doctors, patients and environment.

Conflicts of interest

None.

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Concerns related to the coronavirus disease 2019 pandemic in adult patients with atopic dermatitis and psoriasis treated with systemic immunomodulatory therapy: a Danish questionnaire survey

Dear Editor

Patients with moderate-to-severe atopic dermatitis (AD) or psoriasis often require systemic immunomodulatory therapy. The uncertainty of the potential of these therapies to increase the risk of more serious illness due to coronavirus disease 2019 (COVID-19) may have caused anxiety and led to treatment discontinuation. Therefore, we conducted an anonymous questionnaire on concerns of COVID-19 in patients with AD or psoriasis treated with systemic immunomodulatory therapy.

Adult AD and psoriasis patients with an outpatient visit at the Department of Dermatology at Aarhus University Hospital or Gentofte Hospital, Denmark, between 2 April 2020 and 15 June 2020 were invited to participate. We assessed whether patients were concerned about becoming ill with COVID-19 due to their disease and/or their systemic immunomodulatory therapy and

Table 1 Baseline demographics

	Patients with atopic dermatitis <i>n</i> = 68	Patients with psoriasis <i>n</i> = 233	All patients <i>n</i> = 301
Female, <i>n</i> (%)	31 (46.3)	74 (32.6)	105 (35.7)
Age, <i>n</i> (%)			
18–29 years	15 (22.1)	27 (11.7)	42 (14.1)
30–39 years	10 (14.7)	38 (16.5)	48 (16.1)
40–49 years	19 (27.9)	49 (21.2)	68 (22.7)
50–59 years	12 (17.7)	56 (24.2)	68 (22.7)
60–69 years	6 (8.8)	43 (18.6)	49 (16.4)
70–79 years	5 (7.4)	17 (7.4)	22 (7.4)
80–89 years	1 (1.5)	1 (0.4)	2 (0.7)
Smoking status, <i>n</i> (%)			
Current smoker	19 (28.4)	60 (26.0)	79 (26.5)
Prior smoker	18 (26.9)	109 (47.2)	127 (42.6)
Never smoker	30 (44.8)	62 (26.8)	92 (30.9)
Comorbidities, <i>n</i> (%)			
Hay fever	47 (69.1)	32 (13.7)	79 (26.3)
Asthma	41 (60.3)	25 (10.7)	66 (21.9)
COPD	5 (7.4)	7 (3.0)	12 (4.0)
Diabetes	2 (2.9)	29 (12.5)	31 (10.3)
Cardiovascular diseases	9 (13.2)	42 (18.0)	51 (16.9)
Cancer (ex. skin cancer)	1 (1.5)	8 (3.4)	9 (3.0)
Psoriatic arthritis	—	76 (32.6)	—
Type of treatment, <i>n</i> (%)†			
Conventional systemics	38 (55.9)	114 (48.9)	152 (52.5)
Prednisolone	12 (17.7)	0	12 (4.0)
Biologics	30 (44.1)	155 (66.5)	185 (61.5)
Duration of treatment, <i>n</i> (%)			
<12 months	30 (44.1)	59 (25.3)	89 (29.6)
≥12 months	38 (55.9)	174 (74.7)	212 (70.4)
Feeling disease being well treated, <i>n</i> (%)			
To a great extent	36 (55.4)	163 (70.3)	199 (67.0)
To some extent	18 (27.7)	57 (24.6)	75 (25.3)
To a lesser extent	10 (15.4)	10 (4.3)	20 (6.7)
Not at all	1 (1.5)	2 (0.9)	3 (1.0)
Feeling safe about treatment, <i>n</i> (%)			
To a great extent	37 (56.9)	190 (81.9)	227 (76.4)
To some extent	24 (36.9)	36 (15.5)	60 (20.2)
To a lesser extent	3 (4.6)	6 (2.6)	9 (3.0)
Not at all	1 (1.5)	0	1 (0.3)

COPD, chronic obstructive pulmonary disease; COVID-19, coronavirus disease 2019; ex, excluding.

whether patients discontinued their treatment during the COVID-19 pandemic.

A total of 301 adult patients including 68 with AD and 233 with psoriasis completed the questionnaire. Of these, 35.7% were female and 24.5% were ≥60 years old (Table 1). The most common comorbidities were hay fever (69.1%) and asthma (60.3%) among AD patients, and psoriatic arthritis (32.6%) and cardiovascular diseases (18.0%) among psoriasis patients.

Patients felt to a great extent well treated (67.0%) and safe about their treatment in general (76.4%).

We found that 52.7% were concerned about becoming ill with COVID-19 due to their skin disease and 68.0% due to their treatment, respectively, and 7.3% discontinued their treatment. No differences were observed for age, type of treatment or treatment duration, but female patients were more concerned about becoming ill with COVID-19 due to their treatment than male patients (Table 2). AD patients with asthma were more concerned about becoming ill with COVID-19 due to their AD and treatment, whereas psoriasis patients with psoriatic arthritis were more concerned about becoming ill due to psoriasis (Table 2). Further, patients who in general felt unsafe about their treatment were more concerned about becoming ill with COVID-19 ($P < 0.01$) and were more likely to discontinue their treatment during the COVID-19 pandemic ($P = 0.018$).

Fear of serious consequences of COVID-19 infection might lead patients to discontinue treatment without consulting a dermatologist. An Italian study found 5.2% of 515 psoriasis patients treated with biologics discontinued therapy by themselves.¹ We found 7.3% patients discontinued their therapy. Interestingly, as Denmark has a low proportion of COVID-19 cases, treatment discontinuation could be driven by media-induced fear instead of COVID-19 infections. Indeed, patients who discontinued treatment felt less safe with their treatment in general, highlighting the need of identifying these patients and informing them accordingly. More than half the patients found themselves concerned about becoming ill with COVID-19 due to their disease and/or their treatment. This could be attributed to comorbidities related to increased risk for severe COVID-19 infection, e.g. asthma in AD patients and conflicting information regarding COVID-19. During the early phases of the COVID-19 pandemic, experts disagreed on how to act regarding immunomodulatory therapy.^{2–4} Since then, studies have not found an increased risk of serious consequences of COVID-19 infection in AD or psoriasis patients treated with immunomodulatory therapies.^{5–7} These therapies may even have a protective role against the cytokine storm seen in critical cases of COVID-19.⁸ Currently, trials for targeted immunomodulatory therapies investigating the efficacy in COVID-19 are undergoing,⁹ and dexamethasone has already shown promising results.¹⁰ Some limitations should be considered, e.g. the self-reported nature of the study and that only patients with an outpatient visit at the department of dermatology were included resulting in risk of selection bias. In conclusion, identifying and informing patients feeling unsafe with treatment is important as this might avoid unnecessary treatment discontinuations.

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Table 2 Proportion of patients concerned due to COVID-19 and discontinuing treatment during the COVID-19 pandemic

	Patients concerned of their skin disease due to COVID-19			Patients concerned of treatment due to COVID-19			Patients discontinued treatment during COVID-19 pandemic		
	Yes n = 159	No n = 142	P-value	Yes n = 205	No n = 96	P-value	Yes n = 22	No n = 279	P-value
Sex, n (%)									
Female	62 (39.7)	43 (31.2)	0.13	80 (39.8)	25 (26.9)	0.032	10 (45.5)	95 (34.9)	0.32
Male	94 (60.3)	95 (68.8)		121 (60.2)	68 (73.1)		12 (54.5)	177 (65.1)	
Age, n (%)									
<60 years	123 (77.4)	105 (73.9)	0.49	154 (75.1)	74 (77.1)	0.71	19 (86.4)	209 (74.9)	0.23
≥60 years	36 (22.6)	37 (26.1)		51 (24.9)	22 (22.9)		3 (13.6)	70 (25.1)	
Type of treatment, n (%)									
Biologics	103 (64.8)	82 (57.8)	0.21	133 (64.9)	52 (54.2)	0.08	11 (50.0)	174 (62.4)	0.25
Systemics	85 (53.5)	67 (47.2)	0.28	106 (51.7)	46 (47.9)	0.54	13 (59.1)	139 (49.8)	0.4
Prednisolone	9 (5.7)	3 (2.1)	0.12	9 (4.4)	3 (3.1)	0.6	1 (4.6)	11 (3.9)	0.75
Duration of treatment, n (%)									
<12 months	48 (30.2)	41 (28.9)	0.8	63 (30.7)	26 (27.1)	0.52	6 (27.3)	83 (29.8)	0.81
≥12 months	111 (69.8)	101 (71.1)		142 (69.3)	70 (72.9)		16 (72.7)	196 (70.3)	
Precautions during COVID-19, n (%)									
All precautions	133 (83.7)	65 (45.8)	<0.0001	161 (78.5)	37 (38.5)	<0.0001	—	—	—
Sought advice	98 (61.6)	51 (35.9)	<0.0001	119 (58.1)	30 (31.3)	<0.0001	15 (68.2)	134 (48.0)	0.07
Discontinued treatment	6 (10.1)	16 (4.2)	0.052	20 (9.8)	2 (2.1)	0.017	—	—	—
Social isolation	70 (44.0)	27 (19.0)	<0.0001	88 (42.9)	9 (9.4)	<0.0001	11 (50.0)	86 (30.8)	0.06
Comorbidities, n (%)									
Hay fever†	33 (75.0)	14 (58.3)	0.16	27 (39.7)	20 (29.4)	0.27	2 (66.7)	45 (69.2)	0.93
Asthma†	32 (72.7)	9 (37.5)	0.0046	26 (72.2)	15 (46.9)	0.033	3 (100)	38 (58.5)	0.15
COPD	8 (5.0)	4 (2.8)	0.33	10 (4.9)	2 (2.1)	0.25	4 (18.2)	8 (2.9)	0.0004
Diabetes	16 (10.1)	15 (10.6)	0.89	19 (9.3)	12 (12.5)	0.39	4 (18.2)	27 (9.7)	0.21
Cardiovascular diseases	25 (15.7)	26 (18.3)	0.55	31 (15.1)	20 (20.8)	0.22	4 (18.2)	47 (16.9)	0.87
Cancer (ex. skin cancer)	4 (2.5)	5 (3.5)	0.61	4 (2.0)	5 (5.2)	0.12	0 (0)	9 (3.2)	0.39
Psoriatic arthritis‡	51 (41.5)	25 (22.7)	0.0023	58 (36.0)	18 (25.0)	0.09	8 (42.1)	68 (31.8)	0.36
Feeling disease being well treated, n (%)									
Yes, to a great extent	102 (64.2)	97 (68.3)	0.45	133 (64.9)	66 (68.8)	0.51	8 (36.4)	191 (68.5)	0.0022
Feeling safe about treatment, n (%)									
Yes, to a great extent	108 (67.9)	119 (83.8)	0.0014	141 (68.8)	86 (89.6)	<0.0001	12 (54.6)	215 (77.1)	0.018
COVID-19 symptoms, n (%)									
Yes, having symptoms	32 (21.7)	17 (14.3)	0.12	40 (21.6)	9 (11.1)	0.042	9 (40.9)	40 (16.4)	0.0045

COPD, chronic obstructive pulmonary disease; COVID-19, coronavirus disease 2019; ex, excluding.

P-values < 0.05 are marked in bold.

†Only patients with atopic dermatitis. ‡Only patients with psoriasis.

Conflict of interest

Halling and Loft had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Skov and Thyssen. Acquisition, analysis, and interpretation of data: All authors. Drafting of the manuscript: Halling and Loft. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Loft. Administrative, technical, or material support: None.

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Severe COVID-19 outcomes in patients with psoriasis

Psoriasis is a chronic inflammatory disease associated with comorbidities known to increase risk of severe COVID-19, such as hypertension, cardiovascular disease, diabetes and obesity.^{1,2} Use of systemic therapies may increase a patient's risk of infections.³ Our study aims to evaluate the association of psoriasis systemic therapy and COVID outcomes.

This retrospective cohort study used RPDR, a clinical data registry, to identify patients with psoriasis (ICD-10 code L40) and positive COVID RT-PCR, between March and May/2020. By reviewing medical records on EPIC, active psoriasis prior to COVID was confirmed.

The exposure was psoriasis systemic therapy for at least three months prior to COVID. Our primary outcome was a composite of ICU admission, intubation and/or death.

Table 1 Demographic and clinical characteristics of patients†

	Biologic, n = 24	MTX, n = 10	Systemic therapy, n = 37	No systemic therapy, n = 67	P-value‡
Demographics					
Age (years)	51.9 ± 17.5	63.5 ± 10.6	55.1 ± 16.0	57.4 ± 18.4	0.51
Male	12 (50.0%)	7 (70.0%)	21 (56.8%)	38 (56.7%)	1.0
White	18 (75.0%)	7 (70.0%)	26 (70.3%)	43 (64.2%)	0.67
Comorbidities					
BMI (Kg/cm ²)	30.8 ± 6.8	30.3 ± 7.6	30.1 ± 7.0%	30.5 ± 6.3%	0.77
Current smoking	1 (4.2%)	1 (10.0%)	2 (5.4%)	3 (4.5%)	1.00
Alcohol abuse	1 (4.2%)	1 (10.0%)	2 (5.4%)	7 (10.4%)	0.49
Diabetes mellitus	5 (20.8%)	3 (30.0%)	9 (24.3%)	22 (32.8%)	0.50
Hypertension	15 (62.5%)	6 (60.0%)	22 (59.5%)	34 (50.7%)	0.42
Chronic respiratory disease	4 (16.7%)	4 (40.0%)	8 (21.6%)	16 (23.9%)	0.50
Cardiovascular disease	2 (8.3%)	2 (20.0%)	4 (10.8%)	11 (16.4%)	0.57
Renal disease	2 (8.3%)	0	2 (5.4%)	11 (16.4%)	0.13
Psoriatic Arthritis	16 (66.7%)	6 (60.0%)	24 (64.9%)	3 (4.5%)	<0.001
COVID-19 Outcomes					
Hospital admission			15 (40.5%)	26 (38.8%)	0.86
Supplemental oxygen			9 (24.3%)	24 (35.8%)	0.23
ICU admission			3 (8.3%)	10 (14.9%)	0.34
Orotracheal intubation			2 (5.6%)	6 (9.0%)	0.54
Death			2 (5.6%)	7 (10.8%)	0.39

†Continuous and categorical data are represented by mean ± SD and number of patients (%), respectively. Patients on both a biologic and methotrexate were not shown in the biologic and methotrexate columns, only in the combined systemic therapy column. MTX – methotrexate.

‡Comparison between patients on any systemic therapy and non-systemic therapy, using two-sided Student's *t*-test, Fisher's exact test or logistic regression for continuous and categorical data, respectively.