

LETTER TO THE EDITOR

New-onset and exacerbated skin diseases after COVID-19 infection: A systematic review

Dear Editor,

This systematic review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (Appendix S1). We searched for studies published before January 2022 using the terms “coronavirus,” “COVID-19,” and “skin disease.” Patients who developed a new-onset rash shortly after COVID diagnosis and whose rash was still persistent after resolution of the COVID-19 infection (negative COVID-19 tests/positive immunoglobulin G for COVID-19) were defined as patients with new-onset skin diseases. In cases without repeated COVID-19 tests available, patients with new and persistent skin rashes for ≥ 4 weeks after the COVID-19 diagnosis were included. The other group consisted of patients with existing skin diseases that were exacerbated after COVID-19 infection.¹⁻³

In all, 13985 potentially relevant articles were included (PubMed 3855, Embase 2623, and Scopus 7507). After applying the selection criteria, 65 articles were reviewed (52 case reports, eight case series, and five cross-sectional studies). Of 345 cases, 325 developed new-onset skin diseases, while 20 had pre-existing skin disease flare-ups (Table 1). With the new-onset skin diseases, symptoms appeared as early as 14 days before or as late as 210 days after the COVID-19 diagnosis. The most common was hair disorders (84.9%). The mean age of the patients with hair disorders was 47.0 ± 7.6 years, with a female predominance (77.7%). The median duration for the appearance of hair symptoms after COVID-19 diagnoses was 57.1 days (range 21–210 days). Most of the hair patients (84.4%) presented mild symptoms of COVID-19. The most common hair disorder was telogen effluvium (TE), followed by alopecia and alopecia areata (AA). A systemic review of alopecia in patients with COVID-19 ($n = 1826$) showed that androgenetic alopecia was the most common, followed by TE and AA. Patients with androgenetic alopecia and AA had pre-existing diseases in 100% and 95.1% of patients, respectively, while no patients with TE had pre-existing TE. These results align with our finding that TE was the most common new-onset hair disorder after COVID-19 diagnosis. The mean durations of TE after COVID-19 infection in our study and that review were similar (57.1 vs. 56.5 days). Mainstay treatment was reassurance for spontaneous resolution.⁴




Regarding the 22 cases of exacerbated skin diseases, psoriasis (45%) was the most common. Skin flaring occurred up to 120 days after COVID-19 diagnosis, but there were no reports of flaring

before diagnosis. Similar to the study by Aram et al., psoriasis was also the most common (9/14 cases, 64.3%).⁵ Hydroxychloroquine or systemic corticosteroids, used to treat COVID-19, emotional stress, and the infection itself, can trigger psoriasis and explain why psoriasis is the most common exacerbated condition.⁵

Given our findings, adult patients can be assured that vasculitis, urticaria, chilblains, and livedo lesions are not expected as either new-onset or exacerbated cases after COVID-19. TE is the most common new-onset skin disease after COVID-19 infection that can resolve spontaneously without medications. A limitation of this systematic review is that it did not report cutaneous manifestations or aggravating skin diseases known to be related to COVID-19.

CONFLICT OF INTEREST

None declared.

Leena Chularojanamontri¹ 
 Papapit Tuchinda¹ 
 Chuda Rujitharanawong¹
 Saowalak Hunnangkul²
 Oraya Pochanapan¹ 
 Waratchaya Panjapakul¹
 Kanokvalai Kulthanan¹

¹Department of Dermatology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

²Department of Research and Development, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

Correspondence

Papapit Tuchinda, Department of Dermatology, Faculty of Medicine Siriraj Hospital, Mahidol University, 2 Wanglang Road, Bangkok Noi, Bangkok 10700, Thailand.
 Email: papapitt@gmail.com

ORCID

Leena Chularojanamontri  <https://orcid.org/0000-0001-6625-6445>

Papapit Tuchinda  <https://orcid.org/0000-0002-0599-4062>

Oraya Pochanapan  <https://orcid.org/0000-0002-2725-5850>

TABLE 1 New-onset and flare-up skin diseases after COVID-19 infection

New-onset skin diseases (n = 325)		N/325 (%)		
Hair disorders		276 (84.9)		
Telogen effluvium		260 (94.2)		
Alopecia		10 (3.6)		
Alopecia areata		6 (2.2)		
Varicella zoster infection		11 (3.4)		
Vasculitis		8 (2.5)		
Pityriasis rosea		5 (1.5)		
Urticaria/angioedema		3 (0.9)		
Dermatomyositis		2 (0.6)		
Gianotti-Crosti syndrome		2 (0.6)		
Morphea		2 (0.6)		
Panniculitis		2 (0.6)		
Pityriasis rubra pilaris		2 (0.6)		
Psoriasis		2 (0.6)		
Other diseases ^a		10 (3.1)		
Flare-up skin disease (n = 20)		N/20 (%)		
Psoriasis		9 (45.0)		
Pustular psoriasis		5 (55.6)		
Guttate psoriasis		2 (22.2)		
Unmentioned type		2 (22.2)		
Hereditary angioedema		4 (20.0)		
Urticaria		3 (15.0)		
Chronic spontaneous urticaria		2 (66.7)		
Recurrent acute urticaria		1 (33.3)		
Atopic dermatitis		1 (5.0)		
Recurrent herpes simplex infection		1 (5.0)		
Recurrent varicella zoster infection		1 (5.0)		
Sarcoidosis		1 (5.0)		
Characteristics of patients with hair disorders				
Characteristics	Hair disorders (N, %)	Telogen effluvium (N, %)	Alopecia (N, %)	Alopecia areata (N, %)
N (%)	276/325 (84.9)	260 (94.2)	10 (3.6)	6 (2.2)
Sex, n (%)				
Female	209/269 (77.7)	205/260 (78.8)	1/3 (33.3)	3/6 (50.0)
Age, year (mean ± SD)	47.0 ± 7.6	46.8 ± 7.0	55.7 ± 10.8	40.3 ± 19.9
Median duration from COVID-19 symptoms to skin disease onset, days (IQR)	57.1 (57.1, 57.1)	57.1 (57.1, 57.1)	90.0 (9.0, NA)	36.0 (22.5, 57.0)
Comorbidity	27/38 (71.1)	27/37 (73.0)	NA	0/1 (0.0)
COVID-19 severity, n (%)				
Asymptomatic	28/237 (11.8)	28/232 (12.1)	NA	NA
Mild	200/237 (84.4)	196/232 (84.5)	2/3 (66.7)	2/2 (100.0)
Moderate	6/237 (2.5)	6/232 (2.6)	NA	NA
Severe	3/237 (1.3)	2/232 (0.9)	1/3 (33.3)	NA
Death, n (%)	0/44 (0.0)	0/42 (0.0)	NA	0/2 (0.0)

Abbreviations: IQR, interquartile range; NA, not available; SD, standard deviation.

^aOther diseases that had one case for each disease included Bier anemic spots and cyanosis with an urticaria-like eruption, chilblains, discoid lupus erythematosus, erythema multiforme, erythema gyratum repens, granuloma annulare, keratoderma, lichen planus, pemphigus vulgaris, and systemic sclerosis.

REFERENCES

1. Zhao Q, Fang X, Pang Z, Zhang B, Liu H, Zhang F. COVID-19 and cutaneous manifestations: a systematic review. *J Eur Acad Dermatol Venereol.* 2020;34:2505–10.
2. Daneshgaran G, Dubin DP, Gould DJ. Cutaneous manifestations of COVID-19: an evidence-based review. *Am J Clin Dermatol.* 2020;21:627–39.
3. Genovese G, Moltrasio C, Berti E, Marzano AV. Skin manifestations associated with COVID-19: current knowledge and future perspectives. *Dermatology.* 2021;237:1–12.
4. Nguyen B, Tosti A. Alopecia in patients with COVID-19: a systematic review and meta-analysis. *JAAD Int.* 2022;7:67–77.
5. Aram K, Patil A, Goldust M, Rajabi F. COVID-19 and exacerbation of dermatological diseases: a review of the available literature. *Dermatol Ther.* 2021;34:e15113. <https://doi.org/10.1111/dth.1511>

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.