



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

**Table II.** Frequency of and change in Systemic Lupus International Collaborating Clinics criteria in cutaneous to systemic lupus erythematosus patients at baseline visit and visit of systemic lupus erythematosus diagnosis

| SLICC criteria*         | Initial visit, no. (%) | Visit of SLE diagnosis, no. (%) | Increase between visits, no. (%) |
|-------------------------|------------------------|---------------------------------|----------------------------------|
| Leukopenia              | 1 (10)                 | 4 (40)                          | 3 (30)                           |
| Thrombocytopenia        | 1 (10)                 | 4 (40)                          | 3 (30)                           |
| Synovitis               | 0                      | 2 (20)                          | 2 (20)                           |
| Chronic cutaneous lupus | 8 (80)                 | 10 (100)                        | 2 (20)                           |
| Oral/nasal ulcers       | 2 (20)                 | 3 (30)                          | 1 (10)                           |
| Low complement          | 2 (20)                 | 3 (30)                          | 1 (10)                           |
| Antiphospholipid        | 0                      | 1 (10)                          | 1 (10)                           |
| Lymphopenia             | 1 (10)                 | 2 (20)                          | 1 (10)                           |
| Anti-dsDNA              | 1 (10)                 | 2 (20)                          | 1 (10)                           |
| ANA                     | 8 (80)                 | 9 (90)                          | 1 (10)                           |
| Acute cutaneous lupus   | 3 (30)                 | 3 (30)                          | 0                                |
| Anti-Sm                 | 1 (10)                 | 1 (10)                          | 0                                |

ANA, Antinuclear antibody; *anti-Sm*, anti-Smith antibody; *dsDNA*, double-stranded DNA antibody; *SLE*, systemic lupus erythematosus; *SLICC*, Systemic Lupus International Collaborating Clinics classification criteria for systemic lupus erythematosus.

\*Systemic Lupus International Collaborating Clinics criteria not listed were not present in patients who progressed from cutaneous to systemic lupus erythematosus.

*affiliated academic and health care centers, the National Center for Research Resources, and the National Institutes of Health.*

*IRB approval status: Approved by University of Texas Southwestern Medical Center IRB.*

*Correspondence to: Benjamin F. Chong, MD, MSCS, Department of Dermatology, UT Southwestern Medical Center, 5323 Harry Hines Blvd, Dallas, TX 75390-9069*

*E-mail: ben.chong@utsouthwestern.edu*

#### Conflicts of interest

Dr Chong is an investigator for Daavlin Corporation, Biogen Incorporated, and Pfizer Incorporated. He is a consultant for Viela Bio, Beacon Bioscience, Bristol Meyers Squibb, and Principia Biopharma. Drs Walocko and Li and Author Black have no conflicts of interest to declare.

#### REFERENCES

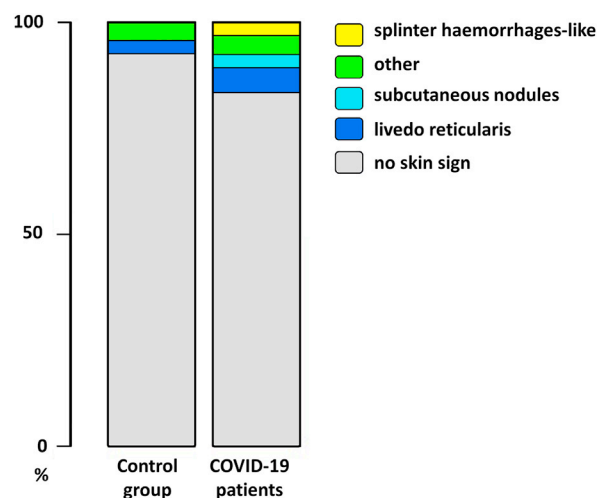
1. Tan EM, Cohen AS, Fries JF, et al. The 1982 revised criteria for the classification of systemic lupus erythematosus. *Arthritis Rheum.* 1982;25(11):1271-1277.
2. Hochberg MC. Updating the American College of Rheumatology revised criteria for the classification of systemic lupus erythematosus. *Arthritis Rheum.* 1997;40(9):1725.
3. Vasquez R, Tseng LC, Victor S, Zhang S, Chong BF. Autoantibody and clinical profiles in patients with discoid lupus and borderline systemic lupus. *Arch Dermatol.* 2012;148(5):651-655.
4. Wieczorek IT, Propert KJ, Okawa J, Werth VP. Systemic symptoms in the progression of cutaneous to systemic lupus erythematosus. *JAMA Dermatol.* 2014;150(3):291-296.
5. Insawang M, Kulthanan K, Chularojanamontri L, Tuchinda P, Pinkaew S. Discoid lupus erythematosus: description of 130 cases and review of their natural history and clinical course. *J Clin Immunol Immunopath Res.* 2010;2(1):1-8.

<https://doi.org/10.1016/j.jaad.2020.12.061>

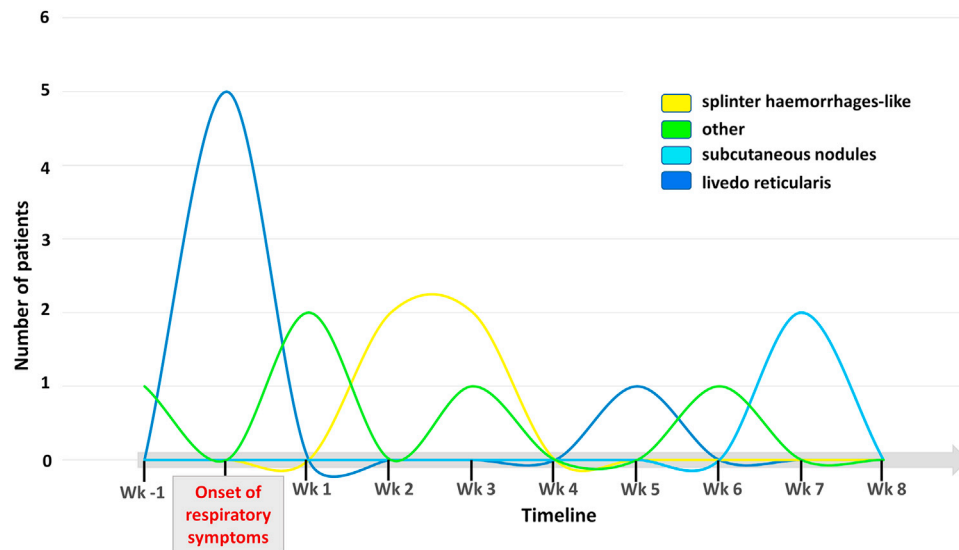
#### Cutaneous manifestations of SARS-CoV-2: A 2-center, prospective, case-controlled study



*To the Editor:* A myriad of potential dermatologic manifestations of COVID-19, caused by SARS-CoV-2, has been reported.<sup>1-5</sup> However, some of these previous reports had considerable limitations, including the lack of laboratory-confirmed COVID-19



**Fig 1.** An overview of cutaneous manifestations in COVID-19 patients and the control group. Skin symptoms were examined in patients who tested positive (n = 102) and negative for SARS-CoV-2 (n = 41). We grouped the skin symptoms into 4 groups: livedo reticularis, splinter hemorrhage-like lesions, subcutaneous nodules, and others. We compared the number of cases in the COVID-19 patients and control group using the Fisher's exact test.



**Fig 2.** Appearance of cutaneous manifestation over time. Timeline of newly manifested skin symptoms in COVID-19 patients depicted as the number of patients with the respective skin symptom over 8 weeks measured from the onset of respiratory symptoms.

diagnosis, suboptimal study designs, or the absence of case controls.

Here, we report the results of a prospective and controlled cohort study with a 4-week follow-up period in which we investigated potential skin findings in 102 hospitalized SARS-CoV-2–positive patients and 41 age- and sex-matched SARS-CoV-2–negative controls with acute, nonprimary infectious diseases of the skin. In the control group, the most common infections were viral respiratory infections (26.8%), bacterial pneumonia (24.4%), and urinary tract infections (14.6%).

We observed newly occurring skin symptoms, concomitant with the infection in 17 (16.6%) COVID-19 patients. Three major groups of cutaneous manifestations were discerned: livedo reticularis ( $n = 6$ , 5.8%), splinter hemorrhage-like lesions ( $n = 4$ , 3.9%), and subcutaneous nodules ( $n = 2$ , 2%) (Fig 1). Five patients had various other skin symptoms (rashes containing macules and papules, papular exanthema, burning sensation of the oral cavity, and vitiligo). In the control group, 5 patients ( $n = 5$ , 12.2%) had an onset of skin symptoms, including livedo reticularis in 1 patient. Four patients had other skin manifestations (petechial enanthem, nail hemorrhage, as well as rashes containing macules and papules). In each group, 1 rash containing macules and papules was considered as drug-induced, whereas no other apparent cause was found in the rest of the patients. Statistical analyses did not reveal significant differences between COVID-19 patients and control group in terms of the occurrence of skin symptoms (Fisher’s exact test;  $P$  value = .6130) (Fig 1).

Livedo reticularis occurred within the first week and splinter hemorrhage-like lesions occurred within the third week after disease onset (Fig 2). Asymptomatic subcutaneous nodules without systemic symptoms occurred in 2 patients 7 weeks after the occurrence of respiratory symptoms (Fig 2). Both patients suffered from a severe course of the disease, including intensive care unit admission. Subcutaneous drug application as a possible cause was excluded. The histopathologic workup result was consistent with reactive septal panniculitis, and both patients were negative for SARS-CoV-2, as determined using a quantitative polymerase chain reaction test. Five months after study inclusion, the patients reported spontaneous partial regression of the nodules.

The relatively small sample size must be considered as a limitation of our study. Therefore, we might have missed less frequent cutaneous manifestations and could not achieve statistical significance regarding the present skin findings.

Although we observed skin symptoms in 16.6% of the patients, including signs of vasculopathy during the early course of the disease and subcutaneous nodules as a possible late manifestation, no statistically significant difference was detected when the COVID-19 patients were compared with the control group of patients with other acute infectious diseases. Therefore, our study suggests that skin manifestations in COVID-19 patients are less specific compared with those previously assumed and cannot be considered as reliable diagnostic tools. Physicians confronted with skin lesions in patients with confirmed or suspected COVID-19 need to

carefully evaluate possible differential diagnoses before attributing the symptoms to COVID-19. Larger and well-planned controlled studies are required to further elucidate skin manifestations in COVID-19 patients.

Luisa Unterluggauer, MD,<sup>a</sup> Isabella Pospischil, MD,<sup>b</sup> Christoph Krall, PhD,<sup>c</sup> Simona Saluzzo, MD, PhD,<sup>a</sup> Susanne Kimeswenger, PhD,<sup>b</sup> Mario Karolyi, MD, MSc,<sup>d</sup> Christoph Wenisch, MD,<sup>d</sup> Bernd Lamprecht, MD, PhD,<sup>e</sup> Emmanuella Guenova, MD, PhD,<sup>f</sup> Stefan Winkler, MD,<sup>g</sup> Csilla Viczenczova, PhD,<sup>b</sup> Andreas Berghaler, DVM,<sup>b</sup> Wolfgang Weninger, MD,<sup>a</sup> Wolfram Hoetzenecker, MD, PhD,<sup>b</sup> and Georg Stary, MD<sup>a</sup>

From the Department of Dermatology, Medical University of Vienna, Vienna<sup>a</sup>; Department of Dermatology, Kepler University Hospital, Johannes Kepler University, Linz<sup>b</sup>; Centre for Medical Statistics, Informatics and Intelligent Systems, Medical University of Vienna<sup>c</sup>; Department for Infectious Diseases and Tropical Medicine, Klinik Favoriten, Vienna<sup>d</sup>; Department of Pneumology, Kepler University Hospital, Johannes Kepler University, Linz<sup>e</sup>; Department of Dermatology, University Hospital Lausanne, Switzerland<sup>f</sup>; Division of Infectious Diseases and Tropical Medicine, Department of Medicine I, Medical University of Vienna, Vienna<sup>g</sup>; and CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences, Vienna.<sup>b</sup>

Drs Unterluggauer and Pospischil contributed equally to this article.

**Funding source:** This work was supported by funds of the Department of Dermatology, Medical University of Vienna, Austria, and the MED-CALL from the Faculty of Medicine, Johannes Kepler University Linz, Austria.

**IRB approval status:** Approved (#1392/2020).

**Correspondence and reprint requests to:** Georg Stary, MD, Department of Dermatology, Medical University of Vienna, Vienna, Austria, Spitalgasse 23, 1090 Vienna, Austria

**E-mail:** [georg.stary@meduniwien.ac.at](mailto:georg.stary@meduniwien.ac.at)

Wolfram Hoetzenecker, MD, PhD, Department of Dermatology, Kepler University Hospital, Johannes Kepler University, Linz, Austria, Krankenhausastraße 9, 4021 Linz, Austria

**E-mail:** [Wolfram.Hoetzencker@kepleruniklinikum.at](mailto:Wolfram.Hoetzencker@kepleruniklinikum.at)

#### Conflicts of interest

None disclosed.

#### REFERENCES

1. Bouaziz JD, Duong T, Jachiet M, et al. Vascular skin symptoms in COVID-19: a French observational study. *J Eur Acad Dermatol Venereol.* 2020;34(9):e451-e452.
2. Fernandez-Nieto D, Jimenez-Cauhe J, Suarez-Valle A, et al. Characterization of acute acral skin lesions in nonhospitalized patients: a case series of 132 patients during the COVID-19 outbreak. *J Am Acad Dermatol.* 2020;83(1):e61-e63.
3. Freeman EE, McMahon DE, Lipoff JB, et al. The spectrum of COVID-19-associated dermatologic manifestations: an international registry of 716 patients from 31 countries. *J Am Acad Dermatol.* 2020;83(4):P1118-P1129.
4. Galvan Casas C, Catala A, Carretero Hernandez G, et al. Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases. *Br J Dermatol.* 2020;183(1):71-77.
5. Recalcati S. Cutaneous manifestations in COVID-19: a first perspective. *J Eur Acad Dermatol Venereol.* 2020;34(5):e212-e213.

<https://doi.org/10.1016/j.jaad.2021.03.064>

#### Utilization of Instagram by dermatology residency programs in the era of COVID-19



*To the Editor:* In response to the COVID-19 pandemic, the Association of American Medical Colleges has instituted protective measures, such as suspending away elective rotations that have limited student exposure to and interactions with residency training programs.<sup>1,2</sup> To combat these limitations, programs have looked for alternative options such as social media. Although a 2019 assessment of social media usage by dermatology residency programs concluded that the usage is sparse,<sup>3</sup> this has likely changed because of the aforementioned restrictions. Here, we assess the current utilization of social media, specifically Instagram, by dermatology residency programs.

A list of accredited programs was obtained from the Electronic Residency Application Service, consisting of 136 residencies. All data collected between January 21, 2021 and February 8, 2021 from residency websites, Google, and the Instagram application were used to identify programs on Instagram (yes/no). To quantify the number of accounts created during the 2020-2021 application cycle, existing accounts were assessed for the year of origination (2020/2021 or before, determined by the date of the first post). To characterize the content receiving the most engagement, each program's profile was searched for the most "liked" post. Posts were categorized into 1 of 7 groups relating to residents, faculty, research/conferences,