



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.



ELSEVIER

**COVID-19: Important Updates and Developments**  
 Edited by Franco Rongioletti, MD and Leonard J. Hoenig, MD

# COVID-19–related skin manifestations: Update on therapy



**Laura Atzori, MD<sup>a</sup>, Sebastiano Recalcati, MD<sup>b</sup>, Caterina Ferreli, MD<sup>a,\*</sup>,  
 Leonard J. Hoenig, MD<sup>c</sup>, Franco Rongioletti, MD<sup>a,d</sup>**

<sup>a</sup> *Dermatology Clinic, Department of Medical Sciences and Public Health, University of Cagliari, Cagliari, Italy*

<sup>b</sup> *Dermatology Unit, Azienda Socio Sanitaria Territoriale (ASST) Lecco, Alessandro Manzoni Hospital, Lecco, Italy*

<sup>c</sup> *Private Practice, Pembroke Pines, Florida, USA*

<sup>d</sup> *Vita-Salute University and Istituto di Ricovero e Cura a Carattere Scientifico (IRCCS) San Raffaele, Milan, Italy*

**Abstract** An increasing body of evidence has been produced in a very limited period to improve the understanding of skin involvement in the current coronavirus 2019 disease pandemic, and how this novel disease affects the management of dermatologic patients. A little explored area is represented by the therapeutic approach adopted for the different skin manifestations associated with the infection. An overview of the current scenario is provided, through review of the English-language literature published until October 30, 2020, and comparison with the personal experience of the authors. As dermatologists, our primary aim is to support patients with the highest standard of care and relieve suffering, even with lesions not life-threatening. With asymptomatic COVID-19 patients, patient discomfort related to skin lesions should not be undervalued and intervention to accelerate healing should be provided. Consensus protocols are warranted to assess the best skin-targeted treatments in COVID-19 patients.

© 2020 Elsevier Inc. All rights reserved.

## Introduction

From the March 11, 2020, declaration of coronavirus 2019 disease (COVID-19) as a pandemic,<sup>1</sup> skin involvement has progressively gained the attention of the medical community, from early limited case series to now a significant body of evidence.<sup>2–18</sup> Although actual worldwide prevalence is still far from being clearly defined, it has been estimated to approach 1% to 2% of the world's population.<sup>19</sup> The presentation is very polymorphic, and according to the Spanish prospective nationwide consensus,<sup>4</sup> three patterns are most characteristics: chilblain-*pernio*-like lesions, ischemic-livedoid/necrotic lesions, and the varicelliform-like/vesicular eruption. Less specific manifestations include erythematous,

urticarial, purpuric, maculopapular, or papulo-squamous eruptions. There is even a peculiar Kawasaki-like presentation in children until October 30, 2020, named “multisystem inflammatory syndrome” (MIS).<sup>20–22</sup>

Interpretation of the underlying pathogenetic mechanisms is a current challenge that commits numerous research groups around the world to distinguish among specific viral skin injuries and the consequences of the multisystemic involvement.<sup>23–34</sup> Substantial breakthroughs will occur, with the development of specific SARS-CoV-2 assays for histopathologic, immunohistochemical, and ultrastructural study of the skin; however, a little explored area is represented by the treatment options adopted to manage these cutaneous manifestations. It may depend on the tendency to the spontaneous recovery of most conditions; alternatively, the therapy of skin lesions may have received less attention in view of the greater severity of lung and multiorgan involvement.

\* Corresponding author. Tel.: +393408918912  
 E-mail address: ferreli@unica.it (C. Ferreli).

We have reviewed the English-language literature published through and augmented our findings with the personal experience of the authors, because symptomatic and supportive treatment are important to relieve the patient discomfort and accelerate skin lesions' healing.

## Materials and methods

A retrieval of published English-language literature was performed until October 30, 2020, collecting original cases or case series of cutaneous manifestations related to COVID-19, with specific information on the treatment adopted. The following databases were consulted: PubMed, Google Scholar, and Research Gate. Key terms included "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2) or "COVID-19" combined with each of the following:

- skin
- cutaneous
- dermatologic or dermatology
- management
- treatment
- therapy

We then analyzed the descriptions of skin manifestations and the related treatments. Treatments of adverse skin reactions to COVID-19 therapies were excluded. Management of common chronic inflammatory skin diseases, and skin cancers or consequences of personal protective devices use were also discarded. Very few reports explicitly included as keywords or title the therapeutic approach for the occurrence of skin lesions associated with COVID-19 infection,<sup>35,36</sup> and several expert reviews were also considered for collecting information on recommended treatment.<sup>13-16</sup>

In parallel, an observational retrospective study was performed on all patients presenting to the Dermatology Unit of the Alessandro Manzoni Hospital in Lecco (Italy). Data collected included demographics, type of skin manifestations, systemic and topical treatment employed, and outcome.

## Observations

Our findings are summarized in [Table 1](#).

The majority of reports concerned chilblain/pernio-like cutaneous manifestations and specify that no treatment was needed.<sup>28,36-40</sup> For isolated cases,<sup>41,42</sup> two expert opinion leaders suggested that high-potency topical corticosteroids may be helpful, if the lesions were causing discomfort.<sup>16,43</sup>

For acro-ischemic lesions, medication with topical corticosteroids, alone or in combination with topical antibiotics, is more widely reported.<sup>4,5,18,44</sup> As these manifestations occur in severely ill patients, due to the prothrombotic setting, treatment with low-molecular-weight heparin can be beneficial.<sup>31</sup> This has been included in standard COVID-19 protocols.<sup>45</sup>

For exanthematous eruption associated with COVID-19, the most specific finding represented by the varicelliform-like/vesicular lesions is usually not specifically treated or discussed in general COVID-19 protocols.<sup>3,4</sup> A prospective observational study from China and Italy documented an overall rate of 7.8% inflammatory cutaneous findings in confirmed COVID-19 patients. These have a self-limiting course and resolution without specific therapy.<sup>6</sup> Several authors have suggested the use of corticosteroids, either topical or oral, plus the administration of oral antihistamines.<sup>4,46-49</sup> One report recommended the use of vitamin C.<sup>49</sup> A systematic review and case series of acute urticaria in COVID-19 patients recommend treatment with antihistamines,<sup>50-53</sup> with additional low-dose prednisone to be considered on an individualized basis.<sup>54</sup> The skin lesions resolved within 24 hours or up to 2 weeks.

Low-dose systemic steroid was also suggested to treat COVID-19-related anagen effluvium in a 35-year-old Iranian woman with a concomitant mixed urticarial and maculopapular dermatitis.<sup>55</sup> Purpuric, petechial, and/or livedoid eruptions are associated with severe COVID-19 and, thus again, beneficiaries of the same supportive measures and anticoagulant treatment of the systemic disease.<sup>30,56,57</sup> More severe erythema multiforme-like eruptions can be treated with systemic steroids,<sup>58,59</sup> as well as leukocytoclastic vasculitis associated with COVID-19. A dose of 0.5 mg/kg daily has been reported as efficacious,<sup>60,61</sup> although a patient already under steroids developed a purpuric leukocytoclastic vasculitis.<sup>62</sup> Further isolated anecdotal case reports were not included in this review.

## Lecco Hospital observations

[Table 2](#) presents the findings from Lecco Hospital for patients with skin manifestations. Additional information includes both inpatients (36 patients) and outpatients (48 patients), as well as the recovery times, ranging from 1 to 8 weeks. An example of chilblain/pernio-like lesions ([Figure 1](#)) and erythema polymorphous lesions ([Figures 2 and 3](#)) are provided.

## Discussion

The exponential rise of pandemic COVID-19 affects all of medicine, notwithstanding dermatology. The disease is so new and different from any previous viral outbreak that protocols and guidelines are lacking.<sup>63</sup> Granted, there is a wide body of evidence being rapidly produced from case reports, observational studies, and systematic reviews. Skin manifestations are often mild and self-limited, except for the severely ill COVID-19 patients who may have experienced disseminated thromboembolic events, accompanied by purpuric eruptions and acro-ischemic lesions.

Table 1 Treatment of skin manifestations associated with COVID-19		
Skin manifestations	Proposed treatment	References
Chilblain/pernio-like lesions	No treatment	28,36-38
	Topical corticosteroids for discomfort	16,39,41,42
Acro-ischemic lesions	Topical corticosteroids alone and/or in combination with topical antibiotics	4,5,18,40,43-45
	Low-molecular-weight heparin	31
Varicelliform-like/vesicular lesions	Wait and see	3,4
	COVID-19 protocols	
Maculopapular eruption	Topical corticosteroids	4,47,49
	Oral antihistamines	
	Oral corticosteroids	
	Vitamin C	50
Urticarial eruption	Topical corticosteroids	
	Oral antihistamines	3,51-54
	Oral steroids	55
Purpuric/petechial/livedoid lesions	Support measures	30,57,58
	Anticoagulation	
Erythema multiforme-like eruption	Systemic steroids (if leukocytoclastic vasculitis see below)	
	Systemic steroids	59,60
Leukocytoclastic vasculitis	Systemic steroids	61,62



**Fig. 1** A 14-year-old girl with pernio-like lesions on the feet (A), partial response to 14 days of topical treatment with corticosteroid-antibiotic cream (B), further treated with oral steroids.

**Table 2** Treatment of skin manifestations associated with COVID-19 from the retrospective study at the Dermatology Unit of the Alessandro Manzoni Hospital in Lecco, Italy

Skin manifestations	No. of cases	Systemic therapy for COVID-19	Targeted skin treatment		Outcome (healing interval)
			Systemic	Topical	
Chilblain-pernio-like lesions	36 outpatients	None	20: None 7: Antihistamines 3: Systemic steroids	9: Topical steroids 25: None	2-8 weeks
Maculopapular eruption	23 22 inpatients	COVID-19 protocols	Oxatomide or chlorpheniramine	None	1-2 weeks
	1 outpatient	Azithromycin Enoxaparin	None	None	2 days
Urticarial dermatitis	7 3 inpatients 4 outpatients	COVID-19 protocols None	Antihistamines Antihistamines 2: Systemic steroids	None None	1-2 weeks 1-2 weeks
	Vesicular dermatitis	7 2 inpatients 5 outpatients	COVID-19 protocols 1: Clarithromycin, hydroxychloroquine 1: Clarithromycin, systemic steroid	None None None	1-2 weeks 1-2 weeks
Erythema multiforme	4 3 inpatients	COVID-19 protocols	Systemic steroids	None	2-4 weeks
	1 outpatient	None	Systemic steroids	None	3 weeks
Skin vasculitis	3 inpatients	COVID-19 protocols	Systemic steroids	Topical antibiotics	5-8 weeks
Acro-ischemic	2 inpatients	COVID-19 protocols	None	Topical antibiotics	2-6 weeks
Thrombotic vasculopathy	1 inpatient	COVID-19 protocols	Enoxaparin	Topical antibiotics	6 weeks
Livedo reticularis	1 outpatient	COVID-19 protocols	None	None	2 days

**Fig. 2** A 35-year-old man with erythema multiforme-like lesions of the hands (dorsal aspects). Response to oral prednisone treatment after 3 weeks.





**Fig. 3** Same 35-year-old man with erythema multiforme-like lesions of the palmar aspects of the hands, before and after treatment with oral prednisone.

Unfortunately, both from the literature review and the authors' personal experience found at the Lecco Hospital, skin disease has been relegated to a general wait-and-see approach. As might be expected, when dealing with a very new disease, priority has been given not to aggravate the infection; for example, the use of systemic corticosteroids was initially avoided for fear of prolonging the COVID-19 disease duration and increasing the mortality rate.<sup>45</sup> Actual guidelines derived from randomized clinical trials now include strong recommendations for the use of corticosteroids in critically ill patients with COVID-19.<sup>64,65</sup>

Another controversial point concerned antihistamines and their effect on the QT interval, especially mizolastine and ebastine, which might trigger cardiac arrhythmias if hydroxychloroquine or azithromycin were concomitantly administered.<sup>66</sup> To avoid such risks, antihistamines devoid of these hazardous drug interactions should be prescribed for maculopapular and urticarial eruption. Hospitalized patients usually benefit from the general supportive cares and constant specialized assistance. Outpatients should be offered targeted skin therapy to shorten the duration of clinical manifestations, when skin manifestations tend to persist longer than expected. Exanthematous eruptions could benefit from topical steroids, alone or in combination with topical antibiotics to relieve tissue inflammation, and accelerate healing. A similar regiment is indicated both for mild chilblain/pernio-like lesions and for more severe acro-ischemic manifestations. Lesions with consistent vascular damage, in the setting of hypercoagulation disease (acro-ischemic, purpuric and livedoid lesions, leukocytoclastic vasculitis), may benefit from the current COVID-19 standard of care, including subcutaneous low-molecular-weight heparins and systemic steroids.

## Conclusions

As dermatologists, our primary aim is to support patients with the highest standard of care and to relieve the associated discomfort, even though the lesions may not be

life-threatening. Patients with mild or asymptomatic disease may benefit from a targeted therapeutic approach that would shorten the course of the disease and reduce discomfort.

## Conflicts of interest

None of the authors have conflicts of interest to disclose.

## References

1. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed.* 2020;91:157–160.
2. Recalcati S. Cutaneous manifestations in COVID-19: a first perspective. *J Eur Acad Dermatol Venereol.* 2020;34 e212–e213.
3. Marzano AV, Genovese G, Fabbrocini G, et al. Varicella-like exanthem as a specific COVID-19-associated skin manifestation: multi-center case series of 22 patients. *J Am Acad Dermatol.* 2020;83: 280–285.
4. Galván Casas C, Català A, Carretero Hernández G. Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases. *Br J Dermatol.* 2020;183:71–77.
5. Fernandez-Nieto D, Jimenez-Cauhe J, Suarez-Valle A, et al. Characterization of acute acro-ischemic lesions in non-hospitalized patients: a case series of 132 patients during the COVID-19 outbreak. *J Am Acad Dermatol.* 2020;83 e61–e63.
6. De Giorgi V, Recalcati S, Jia Z, et al. Cutaneous manifestations related to coronavirus disease 2019 (COVID-19): a prospective study from China and Italy. *J Am Acad Dermatol.* 2020;83:674–675.
7. Su CJ, Lee CH. Viral exanthem in COVID-19, a clinical enigma with biological significance. *J Eur Acad Dermatol Venereol.* 2020;15 e251–e252.
8. Tammaro A, Adebajo GAR, Parisella FR, Pezzuto A, Rello J. Cutaneous manifestations in COVID-19: the experiences of Barcelona and Rome. *J Eur Acad Dermatol Venereol.* 2020;24 e306–e307.
9. Mungmungpuntantip R, Wiwanitkit V. COVID-19 and cutaneous manifestations. *J Eur Acad Dermatol Venereol.* 2020;34:e246.
10. Guarneri C, Venanzi Rullo E, Gallizzi R, et al. Diversity of clinical appearance of cutaneous manifestations in the course of COVID-19. *J Eur Acad Dermatol Venereol.* 2020;34 e449–e450.
11. Recalcati S, Fantini F. Chilblain-like lesions during the COVID-19 pandemic: early or late sign? *Int J Dermatol.* 2020;59 e268–e269.

12. Wollina U, Karadağ AS, Rowland-Payne C, Chiriac A, Lotti T. Cutaneous signs in COVID-19 patients: a review. *Dermatol Ther.* 2020;33:e13549.
13. Gisoni P, Plaserico S, Bordin C, et al. Cutaneous manifestations of SARS-CoV-2 infection: a clinical update. *J Eur Acad Dermatol Venereol.* 2020;34:2499–2504.
14. Singh H, Kaur H, Singh K, Sen CK. Cutaneous manifestations of COVID-19: a systematic review. *Adv Wound Care*, in press.
15. 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;83:1118–1129.
16. Feldman SR, Freeman EE. Coronavirus disease 2019 (COVID-19): cutaneous manifestations and issues related to dermatologic care. Available at: <https://www.uptodate.com/contents/coronavirusdisease-2019-covid-19-cutaneousmanifestations-and-issues-related-to-dermatologic-care>, Last Accessed Sep 28, 2020.
17. Almutairi N, Schwartz RA. COVID-19 with dermatologic manifestations and implications: an unfolding conundrum. *Dermatol Ther.* 2020;33:e13544.
18. Docampo-Simón A, Sánchez-Pujol MJ, Juan-Carpena G, et al. Are chilblain-like acral skin lesions really indicative of COVID-19? A prospective study and literature review. *J Eur Acad Dermatol Venereol.* 2020;34 e445-e447.
19. Matar S, Oulès B, Sohier P, et al. Cutaneous manifestations in SARS-CoV-2 infection (COVID-19): a French experience and a systematic review of the literature. *J Eur Acad Dermatol Venereol.* 2020;34 e686-e689.
20. Riphagen S, Gomez X, Gonzalez-Martinez C, et al. Hyperinflammatory shock in children during COVID-19 pandemic. *Lancet.* 2020;395:1607–1608.
21. Bapst T, Romano F, Müller M, Rohr M. Special dermatological presentation of paediatric multisystem inflammatory syndrome related to COVID-19: erythema multiforme. *BMJ Case Rep.* 2020;13.
22. Verdoni L, Mazza A, Gervasoni A, et al. An outbreak of severe Kawasaki-like disease at the Italian epicentre of the SARS-CoV-2 epidemic: an observational cohort study. *Lancet.* 2020;395:1771–1778.
23. Kaya G, Kaya A, Saurat JH. Clinical and histopathological features and potential pathological mechanisms of skin lesions in COVID-19: review of the literature. *Dermatopathology (Basel).* 2020;7:3–16.
24. Torrelo A, Andina D, Santonja C, et al. Erythema multiforme-like lesions in children and COVID-19. *Pediatr Dermatol.* 2020;37:442–446.
25. Roca-Ginés J, Torres-Navarro I, Sánchez-Arráez J, et al. Assessment of acute acral lesions in a case series of children and adolescents during the COVID-19 pandemic. *JAMA Dermatol.* 2020;156:992–997.
26. Caselli D, Chironna M, Loconsole D, et al. No evidence of SARS-CoV-2 infection by polymerase chain reaction or serology in children with pseudo-chilblain. *Br J Dermatol.* 2020;183:784–785.
27. Kolivras A, Dehavay F, Delplace D, et al. Coronavirus (COVID-19) infection-induced chilblains: a case report with histopathologic findings. *JAAD Case Rep.* 2020;6:489–492.
28. El Hachem M, Diociaiuti A, Concato C, et al. A clinical, histopathological and laboratory study of 19 consecutive Italian paediatric patients with chilblain-like lesions: lights and shadows on the relationship with COVID-19 infection. *J Eur Acad Dermatol Venereol.* 2020;34:2620–2629.
29. Colmenero I, Santonja C, Alonso-Riaño M, et al. SARS-CoV-2 endothelial infection causes COVID-19 chilblains: histopathological, immunohistochemical and ultrastructural study of seven paediatric cases. *Br J Dermatol.* 2020;183:729–737.
30. Magro C, Mulvey JJ, Berlin D, et al. Complement associated microvascular injury and thrombosis in the pathogenesis of severe COVID-19 infection: a report of five cases. *Transl Res.* 2020;220:1–13.
31. Zhang Y, Cao W, Jiang W, et al. Profile of natural anticoagulant, coagulant factor and anti-phospholipid antibody in critically ill COVID-19 patients. *J Thromb Thrombolysis.* 2020;50:580–586.
32. Fernandez-Nieto D, Ortega-Quijano D, Jimenez-Cauhe J, et al. Clinical and histological characterization of vesicular COVID-19 rashes: a prospective study in a tertiary care hospital. *Clin Exp Dermatol.* 2020;45:872–875.
33. Llamas-Velasco M, Chicharro P, Rodríguez-Jiménez P, et al. Comment on ‘clinical and histological characterization of vesicular COVID-19 rashes: a prospective study in a tertiary care hospital’. Pseudoherpetic Grover disease seems to appear in patients with COVID-19 infection. *Clin Exp Dermatol.* 2020;45:896–898.
34. Mahé A, Birckel E, Merklen C, et al. Histology of skin lesions establishes that the vesicular rash associated with COVID-19 is not ‘varicella-like’. *J Eur Acad Dermatol Venereol.* 2020;34 e559-561.
35. Pavone P, Marino S, Marino L, et al. Chilblains-like lesions and SARS-CoV-2 in children: an overview in therapeutic approach. *Dermatol Ther*, in press.
36. Gallizzi R, Sutera D, Spagnolo A, et al. Management of pernio-like cutaneous manifestations in children during the outbreak of COVID-19. *Dermatol Ther*, in press.
37. Piccolo V, Neri I, Filippeschi C, et al. Chilblain-like lesions during COVID-19 epidemic: a preliminary study on 63 patients. *J Eur Acad Dermatol Venereol.* 2020;34:e291–e293.
38. Colonna C, Monzani NA, Rocchi A, et al. Chilblain-like lesions in children following suspected COVID-19 infection. *Pediatr Dermatol.* 2020;37:437–440.
39. Recalcati S, Barbagallo T, Frasin LA, et al. Acral cutaneous lesions in the time of COVID-19. *J Eur Acad Dermatol Venereol.* 2020;34 e346-e347.
40. Romani J, Baselga E, Mitjà O, et al. Chilblain and Acral Purpuric Lesions in Spain during Covid Confinement: Retrospective Analysis of 12 Cases. *Actas Dermosifiliogr.* 2020;111:426–429.
41. Ludzik J, Witkowski A, Hansel DE, et al. Case report: chilblains-like lesions (COVID-19 toes) during the pandemic-is there a diagnostic window? *F1000 Res.* 2020;9:668.
42. Mohan V, Lind R. Chilblains in COVID-19 infection. *Cureus.* 2020;12:e9245.
43. Latha MA, Luca N, Constantinescu C, Naert K, Ramien ML. Approach to chilblains during the COVID-19 pandemic [formula: see text]. *J Cutan Med Surg.* 2020;24:504–517.
44. Saenz Aguirre A, De la Torre Gomar FJ, Rosés-Gibert P, et al. Novel outbreak of acral lesions in times of COVID-19: a description of 74 cases from a tertiary university hospital in Spain. *Clin Exp Dermatol.* 2020;45:1065–1067.
45. Kakodkar P, Kaka N, Baig M. A comprehensive literature review on the clinical presentation, and management of the pandemic coronavirus disease 2019 (COVID-19). *Cureus.* 2020;12:e7560.
46. Ehsani AH, Nasimi M, Bigdelo Z. Pityriasis rosea as a cutaneous manifestation of COVID-19 infection. *J Eur Acad Dermatol Venereol.* 2020;34 e436-e437.
47. Mahé A, Birckel E, Krieger S, Merklen C, Bottlaender L. A distinctive skin rash associated with coronavirus disease 2019? *J Eur Acad Dermatol Venereol.* 2020;34 e246-e247.
48. Gianotti R, Veraldi S, Recalcati S, et al. Cutaneous clinico-pathological findings in three COVID-19-positive patients observed in the metropolitan area of Milan, Italy. *Acta Derm Venereol.* 2020;100 adv00124.
49. Iancu GM, Solomon A, Birlutiu V. Viral exanthema as manifestation of SARS-CoV-2 infection: a case report. *Medicine.* 2020;99:e21810.
50. Abuelgasim E, Dona ACM, Sondh RS, Harky A. Management of urticaria in COVID-19 patients: a systematic review. *Dermatol Ther.* 2020, in press.
51. Henry D, Ackerman M, Sancelme E, Finon A, Esteve E. Urticarial eruption in COVID-19 infection. *J Eur Acad Dermatol Venereol.* 2020;34 e244-e245.

52. Van Damme C, Berlingin E, Saussez S, Accaputo O. Acute urticaria with pyrexia as the first manifestations of a COVID-19 infection. *J Eur Acad Dermatol Venereol.* 2020;34 e300-e301.
53. Quintana-Castanedo L, Feito-Rodriguez M, Valero-Lopez I, et al. Urticarial exanthem as early diagnostic clue for COVID-19 infection. *JAAD Case Rep.* 2020;6:498–499.
54. Shansai M. Low-dose systemic steroids, an emerging therapeutic option for COVID-19 related urticaria. *J Dermatol Treat,*2020, in press.
55. Shanshal M. COVID-19 related anagen effluvium. *J Dermatolog Treat,*in press.
56. Zhou B, She J, Wang Y, Ma X. Venous thrombosis and arteriosclerosis obliterans of lower extremities in a very severe patient with 2019 novel coronavirus disease: a case report. *J Thromb Thrombolysis.* 2020;50:229–232.
57. Manalo IF, Smith MK, Cheeley J, Jacobs R. A dermatologic manifestation of COVID-19: transient livedo reticularis. *J Am Acad Dermatol.* 2020;83:700.
58. Jimenez-Cauhe J, Ortega-Quijano D, Carretero-Barrio L, et al. Erythema multiforme-like eruption in patients with COVID-19 infection: clinical and histological findings. *Clin Exp Dermatol.* 2020;45:892–895.
59. Demirbaş A, Elmas OF, Atasoy M, Türsen U, Lotti T. A case of erythema multiforme major in a patient with COVID 19: the role of corticosteroid treatment. *Dermatol Ther,* in press.
60. Mayor-Ibarguren A, Feito-Rodriguez M, Quintana Castanedo L, et al. Cutaneous small vessel vasculitis secondary to COVID-19 infection: a case report. *J Eur Acad Dermatol Venereol.* 2020;34 e541-e542.
61. Camprodon Gómez M, González-Cruz C, Ferrer B, Barberá MJ. Leucocytoclastic vasculitis in a patient with COVID-19 with positive SARS-CoV-2 PCR in skin biopsy. *BMJ Case Rep.* 2020;13 e238039.
62. Caputo V, Schroeder J, Rongioletti F. A generalized purpuric eruption with histopathologic features of leucocytoclastic vasculitis in a patient severely ill with COVID-19. *J Eur Acad Dermatol Venereol.* 2020;34 e579-e581.
63. Freeman EE, McMahon DE. Creating dermatology guidelines for COVID-19: the pitfalls of applying evidence-based medicine to an emerging infectious disease. *J Am Acad Dermatol.* 2020;82 e231-e232.
64. Horby P, Lim WS, Emberson JR, et al. Dexamethasone in hospitalized patients with COVID-19 - preliminary report. *N Engl J Med,* in press.
65. Prescott HC, Rice TW. Corticosteroids in COVID-19 ARDS: evidence and hope during the pandemic. *JAMA.* 2020;324:1292–1295.
66. Atzori L, Perla S, Atzori MG, Ferrel C, Rongioletti F. Cutaneous drug eruptions associated with COVID-19 therapy. *JAAD Int.* 2020;1:73–76.