

PROF. FRANCO RONGIOLETTI (Orcid ID : 0000-0002-2227-581X)

Article type : Letter to Editor

SARS-CoV, Mers-CoV and Covid-19: what differences from a dermatological viewpoint?

Author: Franco Rongioletti

Institution: Unit of Dermatology, Department of Medical Sciences and Public Health, University of Cagliari, Italy

Key words: SARS, MERS, Covid-19, coronavirus outbreaks, skin manifestations

Words: 597

Figures: 0

Tables: 0

Corresponding author: Franco Rongioletti,
franco.rongioletti@me.com

However, no clinical

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/JDV.16738](https://doi.org/10.1111/JDV.16738)

This article is protected by copyright. All rights reserved

**images are available in the article because of the risk
involved in infecting other people**

Funding sources: None

Conflict of interest: None

Dear Editor

Over the past two decades, 3 zoonotic global coronavirus outbreaks have occurred:

1. SARS starting in 2002 in China due to SARS-CoV; 2. MERS starting in 2012 in Saudi Arabia due to MERS-CoV; 3. Covid-19 due to SARS-CoV-2 starting in 2019 in Wuhan, China (1). Both beta-coronaviruses, SARS-CoV and MERS-CoV caused a severe disease in most infected people. In fact, as many as 8700 cases were confirmed from 37 countries with 775 deaths for SARS while 2494 MERS cases and 858 deaths have been reported worldwide in 27 countries. SARS-CoV-2 caused a pandemic that spread across 203 countries in all 5 major continents involving many more cases than its predecessors (2). Phylogenetic analysis of SARS-CoV-2 indicated that it is related to SARS-CoV (~79%) and MERS-CoV (~50%) (3).

Pathological manifestations of COVID-19 greatly resemble what has been seen in SARS and MERS infection as well as the pathologic findings indicates that a similar cytokine cascade storm play a critical role in patient rapid death (4).

However, it is clear now that the epidemic of COVID-19 is different from SARS and MERS. Although presenting symptoms are similar—fever and cough, progressing to pneumonia in severe cases, with poorer outcomes associated with men gender, older age and comorbidities—SARS and MERS were/are much less transmissible but more likely to be severe or fatal than COVID-19. In fact, COVID-19 has a general fatality rate of 3.4% lower than that of SARS (9.6%) and much lower than that of MERS (34.4%) (5) but SARS-CoV-2 caused many more deaths.

As for dermatology, the most relevant difference between Covid-19 and SARS/MERS is the absolute lack of reports of skin manifestations in the latter.

Actually, many cutaneous manifestations have been described in association with SARS-COV-2 infection, although their prevalence is controversial ranging from 0.2%

in a cohort of 1099 Chinese patients to 20.4% in an Italian study of 88 patients (8,9).

They include: pseudo-chilblain lesions, livedoid or necrotic lesions and vesicular eruptions which appear as the most characteristic ones and urticarial, purpuric and maculopapular eruptions which are the most frequent rashes, albeit less specific (6,7).

The reasons why there is a robust evidence in the literature of cutaneous manifestations in Covid-19 due to SARS-CoV-2 and not even one report of skin rashes both in SARS-CoV and MERS-CoV infections is unclear. One possible explanation is that the international response to COVID-19 has been more transparent and efficient when compared to the SARS /MERS outbreaks. The rapidly progressing of COVID-19 pandemic has become a global concern stimulating a lot of dermatological researches with many more cases than its predecessors. Another explanation is that a part of these skin manifestations of Covid-19 is not directly related to the virus but to the multi drugs which have been used in a relatively large amount in Covid-19 compared to the therapies used for the previous epidemic of SARS and MERS (10). In this setting, we cannot rule out that, in view of the greater severity of lung and multiorgan involvement in SARS and MERS, the skin has received less attention or that SARS-CoV and MERS-CoV may have less tropism for the skin than Sars-Cov-2.

There is still much more to know about skin manifestations associated with COVID-19 but unfortunately, we cannot learn from the *experience of previous* coronavirus epidemics. It is only with this new pandemic that dermatologists are exploring a new chapter whose aim is not only to identify patients or asymptomatic carriers in the risk population throughout skin signs but also to understand whether skin rashes could be a part of a potential transmission route for SARS-CoV-2.

here is an

increasing concern whether skin rashes could be a part of a potential transmission route for SAR

References

1. Contini C, Di Nuzzo M, Barp N, et al. The novel zoonotic COVID-19 pandemic: An expected global health concern. *J Infect Dev Ctries*. 2020;14:254-264.
2. Raoult D, Zumla A, Locatelli F, Ippolito G, Kroemer G. Coronavirus infections: Epidemiological, clinical and immunological features and hypotheses. *Cell Stress*. 2020; 4:66-75.
3. Chan JF, Kok KH, Zhu Z, Chu H, To KK, Yuan S, Yuen KY. Genomic characterization of the 2019 novel human-pathogenic coronavirus isolated from a patient with atypical pneumonia after visiting Wuhan. *Emerg Microbes Infect*. 2020; 9:221-36.
4. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, Liu S, Zhao P, Liu H, Zhu L, Tai Y, Bai C, Gao T, et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. *Lancet Respir Med*. 2020; 8:420–22.
5. Munster V.J., Koopmans M., van Doremalen N., van Riel D., de Wit E. A novel coronavirus emerging in China — key questions for impact assessment. *N Engl J Med*. 2020 January doi: 10.1056/NEJMp2000929.
6. Galván Casas C, Català A, Carretero Hernández G, et al. Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases [published online ahead of print, 2020 Apr 29]. *Br J Dermatol*. 2020;10.1111/bjd.19163.

7. Marzano AV, Genovese G, Fabbrocini G, et al. Varicella-like exanthem as a specific COVID-19-associated skin manifestation: multicenter case series of 22 patients [published online ahead of print, 2020 Apr 16]. *J Am Acad Dermatol*. 2020;S0190-9622(20)30657-5.
8. Guan WJ, Ni ZY, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020;382(18):1708-1720.
9. Recalcati S. Cutaneous manifestations in COVID-19: a first perspective [published online ahead of print, 2020 Mar 26]. *J Eur Acad Dermatol Venereol*. 2020;10.1111/jdv.16387.
10. Türsen Ü, Türsen B, Lotti T. Cutaneous Side-Effects of the Potential Covid-19 Drugs. *Dermatol Ther*. 2020;e13476.

Guan W, Ni Z, Hu Y, Liang WH, Ou CQ, He JX et al. Clinical characteristics of coronavirus disease 19 in China. *N Engl J Med* 2020; Feb 28. doi: 10.1056/NEJMoa2002032. [Epub ahead of print]

2. Recalcati S. Cutaneous manifestations in COVID-19: a first perspective. *J Eur Acad Dermatol Venereol*. 2020 Mar 26. doi: 10.1111/jdv.16387. [Epub ahead of print]

Guan W, Ni Z, Hu Y, Liang WH, Ou CQ, He JX et al. Clinical characteristics of coronavirus disease 19 in China. *N Engl J Med* 2020; Feb 28. doi: 10.1056/NEJMoa2002032. [Epub ahead of print]

2. Recalcati S. Cutaneous manifestations in COVID-19: a first perspective. J Eur Acad Dermatol

Venereol. 2020 Mar 26. doi: 10.1111/jdv.16387. [Epub ahead of print

Guan W, Ni Z, Hu Y, Liang WH, Ou CQ, He JX et al. Clinical characteristics of coronavirus

disease 19 in China. N Engl J Med 2020; Feb 28. doi: 10.1056/NEJMoa2002032.

[Epub ahead

of print