

- 2 Henry D, Ackerman M, Sancelme E, Finon A, Esteve E. Urticarial eruption in COVID-19 infection. *J Eur Acad Dermatol Venereol* 2020. <https://doi.org/10.1111/jdv.16472>
- 3 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. <https://doi.org/10.1111/jdv.16471>
- 4 Alramthan A, Aldaraji W. A case of COVID-19 presenting in clinical picture resembling chilblains disease. First report from the Middle East. *Clin Exp Dermatol* 2020. <https://doi.org/10.1111/ced.14243>
- 5 Mazzotta F, Troccoli MF, Bonifazi E. A new vasculitis at the time of COVID-19. *Eur J Pediatr Dermatol* 2020. URL <https://www.ejpd.com/imagines/nuova-vasculite-covid-ENG.pdf> (last accessed: 18 Apr 2020).
- 6 Mavragani A. Tracking COVID-19 in Europe: an infodemiology study. *JMIR Public Health Surveill* 2020; **6**: e18941. <https://doi.org/10.2196/18941>
- 7 Effenberger M, Kronbichler A, Shin JI, Mayer G, Tilg H, Perco P. Association of the COVID-19 pandemic with internet search volumes: a Google Trends(TM) analysis. *Int J Infect Dis* 2020; **95**: 192–197.
- 8 Walker A, Hopkins C, Surda P. The use of google trends to investigate the loss of smell related searches during COVID-19 outbreak. *Int Forum Allergy Rhinol* 2020. <https://doi.org/10.1002/alr.22580>

DOI: 10.1111/jdv.16572

## Evolution of COVID-19 infection in four psoriatic patients treated with biological drugs

### Editor

Since December 2019, the pandemic coronavirus disease (2019-nCoV; COVID-19) has changed the approach to all dermatological diseases; in particular, psoriatic patients undergoing immunosuppressive drugs, such as biologics, can potentially show an increased risk of infection.<sup>1</sup> However, few reports are available on the course of COVID-19 infection in psoriatic patients treated with biological drugs.<sup>2</sup> We describe a case series of four psoriatic patients treated with biologics who had a risk contact with COVID-19.

Case 1: A 62-year-old man, affected by hypertension, diabetes, chronic renal failure and overweight (BMI: 29), receiving guselkumab since November 2019, who developed a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on February 23; he was admitted to an intensive care unit for 2 weeks. After 1 month of hospitalization, he was discharged with almost complete resolution of respiratory symptoms; despite discontinuation of guselkumab, psoriasis remained in complete remission.

Case 2: A 66-year-old man, health volunteer, affected by hypertension, dyslipidaemia and previous myocardial infarction, receiving ustekinumab since 2010; on March 15th, 7 days after the last administration of the drug, he presented asthenia, anosmia and ageusia. On March 18th, he was tested positive for COVID-19 and he did not receive any pharmacological treatment; after a complete remission of symptoms, on April 15th he was tested negative, with maintenance of the remission of psoriasis.

Case 3: A 67-year-old woman, affected by hypertension and metabolic syndrome, receiving adalimumab since September 2019, at the end of February had several contacts with three of her family members suffering from a mild SARS-CoV-2 and she was therefore subjected to quarantine for 15 days, without developing any symptoms of the disease and without stopping psoriasis therapy.

Case 4: A 66-year-old man, affected by hypertension, diabetes, metabolic syndrome and obesity (BMI: 32), receiving secukinumab since October 2018, had a continuous contact with his wife affected by a mild SARS-CoV-2 infection since March 17th; he was therefore quarantined for 15 days, without developing any symptoms of the disease and without stopping psoriasis therapy.

In the last two cases, the biologic therapy was interrupted only during the quarantine period, without worsening of psoriasis and no test has been done for COVID-19.

In SARS-CoV-2 infection, the immune response plays an important role in the development of an excessive inflammatory response, which can evolve towards an acute respiratory distress syndrome (ARDS), potentially lethal for the patient.<sup>3</sup> Some key cytokines in the pathogenesis of psoriasis, such as tumour necrosis factor alpha (TNF- $\alpha$ ) and interleukin-17 (IL-17), are increased in inflammatory response to coronavirus and viral pneumonia, while IL-23 does not seem to be essential for an effective immune response.<sup>4</sup> The increase in inflammatory cytokines is associated with a worsening of clinical conditions of the patients affected by SARS-CoV-2.<sup>3,5</sup> Based on these observations, it has been hypothesized that anti-TNF- $\alpha$  or anti-IL-17 drugs could play a potential role to improve COVID-19's 'cytokine storm' and ARDS.<sup>6</sup> For this reason, the use of ixekizumab and adalimumab associated with antiviral drugs is currently studied in China in the treatment for Covid-19.<sup>7,8</sup> Despite the presence of risk factors for a worse prognosis (hypertension, diabetes, obesity and male gender), only one patient presented a severe form of SARS-CoV-2, while another one a mild form. Despite a prolonged contact with subjects with COVID-19 infection, the other two cases did not show any symptoms. This could explain the positive course of COVID-19 infection in our four cases, where ongoing treatment with biological drugs could play a protective role against the onset and the evolution of the infection. Further studies are needed to investigate this hypothesis.

### Founding source

None declared.

A. Conti,\*  C. Lasagni, L. Bigi, G. Pellacani

Department of Surgical, Medical, Dental and Morphological Sciences related to Transplant, Oncology and Regenerative Medicine, Dermatology Unit, University of Modena and Reggio Emilia, Modena, Italy

\*Correspondence: A. Conti. E-mail: a.conti.dermo@gmail.com

## References

- 1 Lebwahl M, Rivera-Oyola R, Murrell DF. Should biologics for psoriasis be interrupted in the era of COVID-19? *J Am Acad Dermatol* 2020; **82**:1217–1218
- 2 Messina F, Piaserico S. SARS-CoV-2 infection in a psoriatic patient treated with IL-23 inhibitor. *J Eur Acad Dermatol Venereol* 2020. [Epub ahead of print]. <https://doi.org/10.1111/jdv.16468>
- 3 Huang C, Wang Y, Li X *et al*. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; **395**: 497–506.
- 4 Shi X, Zhou W, Huang H *et al*. Inhibition of the inflammatory cytokine tumor necrosis factor- $\alpha$  with etanercept provides protection against lethal H1N1 influenza infection in mice. *Crit Care* 2013; **17**: R301.
- 5 Chen C, Zhang X, Ju Z, He W. Research progress on the mechanism of cytokine storm induced by new coronavirus pneumonia and related immunotherapy [J/OL]. *Chin J Burns* 2020, **36**. [Epub ahead of print]. <https://doi.org/10.3760/cma.j.cn501120-20200224-00088>
- 6 Zumla A, Hui DS, Azhar EI, Memish ZA, Maeurer M. Reducing mortality from 2019-nCoV: host-directed therapies should be an option. *Lancet* 2020; **395**: e35–e36.
- 7 A randomized, blinded controlled, multicenter clinical trial to evaluate the efficacy and safety of Ixekizumab combined with conventional antiviral drugs in patients with novel coronavirus pneumonia (COVID-19). URL <http://www.chictr.org.cn/showprojen.aspx?proj=50251> (last accessed: 19 April 2020).
- 8 A clinical study for the efficacy and safety of Adalimumab Injection in the treatment of patients with severe novel coronavirus pneumonia (COVID-19). URL <http://www.chictr.org.cn/showprojen.aspx?proj=49889> (last accessed: 19 April 2020).

DOI: 10.1111/jdv.16587

## Drug-induced vasculitis in a patient with COVID-19

### Editor,

A 57-year-old German woman with a history of skin reactions to unknown antibiotics, depression and high blood pressure presented with a 2-day history of symmetrically distributed pruritic pink-to-red maculopapular exanthema on the trunk and extremities.

Due to a 3-week history of a non-productive cough and intermittent fever, she has taken amoxicillin, ibuprofen and metemazole 3 days before. She did not take aspirin or other anticoagulants.

This prescription was discontinued and an intravenous bolus of prednisolone as well as antihistamines and topical glucocorticoids were administered.

After 2 days, her rash progressed in purpuric, non-blanching, pruritic and painful maculas and plaques on her trunk and extremities (Figs 1 and 2). Mucous membranes were spared. The patient was afebrile, and her oxygen saturation was 98% while she was breathing ambient air.

The blood count, prothrombin time and partial thromboplastin time were normal. An elevated D-dimer level by 2.051  $\mu\text{g/L}$  was observed. A chest radiograph showed a right lower lobe



**Figure 1** Symmetric, purpuric, non-blanching and palpable maculas and plaques on lower extremities of the patient.



**Figure 2** Purpuric, non-blanching and palpable maculas and plaques on the trunk and upper extremities of the patient.

consolidation suggestive of pneumonia. A test to detect SARS-CoV-2 by real-time reverse-transcription-polymerase-chain-reaction (RT-PCR) assay of a throat swab was positive. A biopsy specimen of the skin lesion revealed a vasculitis. Blood tests for HIV, antinuclear antibodies and antineutrophil cytoplasmic antibodies were negative.

The patient was treated with 120 mg of prednisolone per day (1.5 mg per kilogram of body weight). After 9 days, the patient's skin lesions and her respiratory symptoms improved. Two negative SARS-CoV-2 by RT-PCR tests of throat swabs with sampling interval of 24 h were confirmed and the patient was discharged home.

Despite an antibiotic allergy could developed the rash and vasculitis in our patient, it is known that severe COVID-19 induces endothelial damage and thrombosis.<sup>1,2</sup> Some reports have showed urticaria, rash, vesicles, purpura, chilblain-like and