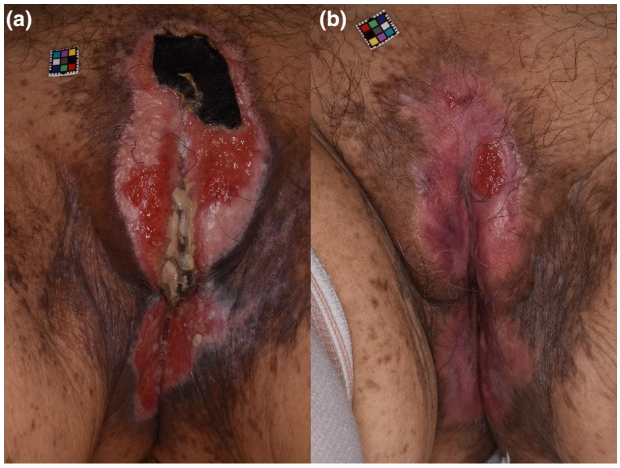

Figure 2 Improvement of the skin lesions. (a) Most of the eschar had fallen off one month after admission. (b) Epithelization was almost completed one month after discharge.

the first case of extensive skin necrosis after COVID-19 vaccination that developed outside the injection site. Although the mechanism of platelet thrombi formation in genital skin is unclear, the short time interval between the vaccination and the onset of symptoms may indicate a causal relationship. Therefore, our case extends the range of cutaneous manifestations associated with thrombosis after COVID-19 vaccination. In addition, it should be noted that she developed thrombosis despite receiving edoxaban, which highlights the need to consider the possibility of thrombosis even in patients under anticoagulant therapy. Although rare, skin necrosis should be recognized as a possible manifestation of thrombosis associated with COVID-19 vaccination.

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Conflicts of interest
The authors have no conflict of interest to declare.

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Data availability statement
The data presented in this manuscript are available from the corresponding author upon reasonable request.

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Pityrosporum folliculitis in critically ill COVID-19 patients

Dear Editor,

During the *Coronavirus* disease 2019 (COVID-19) pandemic, dermatologists are dealing with challenging clinical scenarios in their clinical practice. A wide range of cutaneous manifestations has been described, either directly associated with the COVID-19, or as a consequence of management procedures, as well as an exacerbation of previous cutaneous conditions.[1]

We have read with great interest the paper published by Barrera-Godinez et al.,[2] in which they mention *Pityrosporum* folliculitis in COVID-19 patients. We have recently evaluated three patients in the intensive care unit (ICU), diagnosed with COVID-19 acute respiratory distress syndrome (ARDS) presenting similar cutaneous manifestations.

Initially, we were called to evaluate a 52-year-old obese man, with type 2 diabetes, under mechanical ventilation in a prone position and receiving systemic corticosteroids, due to a severe COVID-19 ARDS. He had also evolved with acute renal failure and septic complications (ventilator-associated pneumonia and septic shock by bloodstream infection), using several systemic antibiotics. A monomorphic eruption of follicular erythematous papules and pustules was observed on the chest, upper and lower limbs, on the back and abdomen after 6 days in the ICU. We

also examined a 46-year-old obese man, with no other comorbidities, recovering from a severe COVID-19 ARDS, still using systemic corticosteroids and vancomycin due to septic complications, but no longer under mechanical ventilation. A monomorphic eruption of erythematous follicular papules and pustules on the chest, abdomen, back and upper limbs was also observed, starting after 10 days in the ICU. The third patient was a 39-year-old obese man also recovering from a severe COVID-19 ARDS, still using systemic corticosteroids and receiving broad-spectrum antibiotic therapy due to ventilator-associated pneumonia. Almost one month after hospitalization, erythematous papules and pustules were noticed on the anterior thorax, abdomen, back and upper limbs (Fig. 1). Histologic examination of all patients revealed a chronic suppurative folliculitis with *Pityrosporum* species visualized periodic acid–Schiff (PAS) and Grocott stain (Fig. 2).

Pityrosporum folliculitis is characterized by overgrowth of yeasts of *Malassezia* family, causing inflammation in the hair follicles that occurs due to a modification of the cutaneous flora.[3,4] As observed in our patients, it presents as an acneiform eruption, commonly affecting trunk and upper limbs.[3–6] It is often pruritic,[4–6] although in critical patients to evaluate this symptom might depend on their level of consciousness.

The patients described above presented several potential predisposing factors for *Pityrosporum* folliculitis, such as the use of broad-spectrum systemic antibiotic regimens that affect normal cutaneous flora, the use of systemic corticosteroids, which potentially affects host defence mechanisms and episodes of increased sweating that are common in prolonged ICU hospitalizations.[4–6] Obesity, another common clinical aspect presented in our patients, is a well-known risk factor for the development of cutaneous infections such as folliculitis.[7]

Pityrosporum folliculitis might be frequently misdiagnosed with other follicular eruptions.[3–6] In the scenario of critically ill COVID-19 patients, other causes for the presence of a monomorphic eruption of erythematous follicular papules and pustules may be considered, such as bacterial folliculitis, acneiform eruption induced by systemic corticosteroid therapy, acute generalized exanthematous pustulosis (AGEP) and a cutaneous eruption due to the COVID-19 infection.[2,8] Histopathology may be crucial to confirm the diagnosis and to rule out other causes.[4,5,9]

Barrera-Godinez et al.[2] have recently reported that *Pityrosporum* folliculitis may be found in COVID-19 patients. Our report reinforces that this association is probably frequent and

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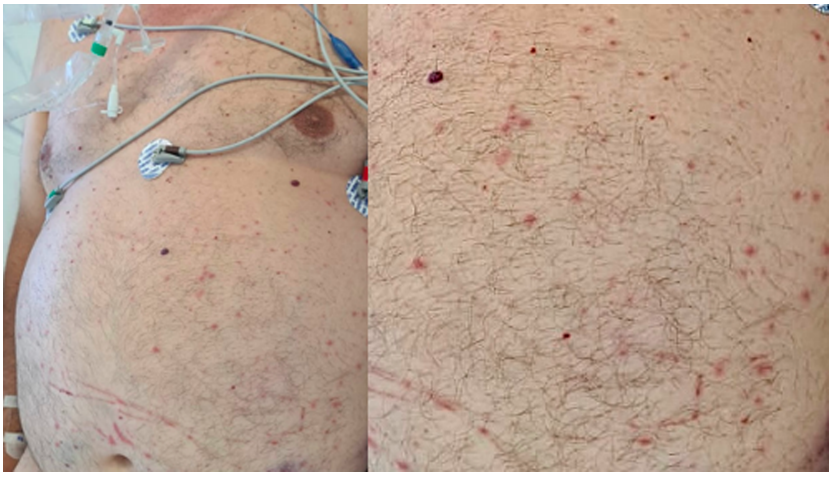

Figure 1 Erythematous follicular papules observed on the anterior thoracic and abdominal regions of the third patient.

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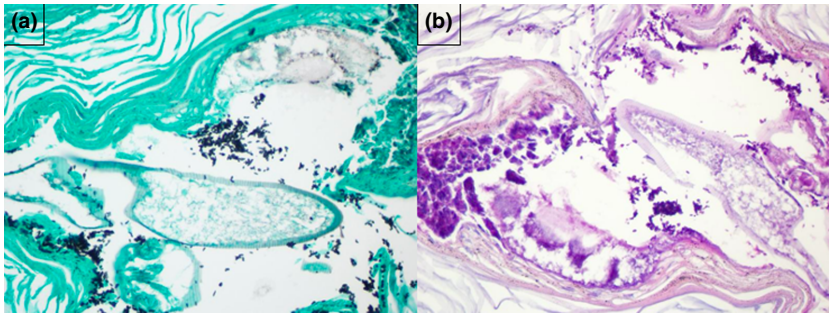

Figure 2 Pityrosporum species visualized with Grocott (a) and PAS (b).

that clinicians might consider the diagnosis of *Pityrosporum* folliculitis in patients presenting a monomorphic eruption of erythematous follicular papules and pustules, especially on the trunk, following the use of systemic corticosteroids and broad-spectrum antibiotics for severe COVID-19 ARDS.

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Conflict of interest

I hereby declare that the manuscript authors have no conflicts of interest.

Data Availability Statement

Data are openly available in a public repository that issues datasets with DOIs.

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Concomitant SARS-CoV-2 infection and crusted scabies in a 4-month infant

To the Editor,

Crusted scabies (CS) is a severe form of scabies caused by hyperinfestation of mites in the horny layer of the epidermis that thickens and forms warty crusts.[1] Although it has been described mainly in immunosuppressed individuals, it has been also observed in otherwise healthy patients.[1] We are living the coronavirus disease 2019 (COVID-19) outbreak, that is, a mild/moderate disease in children.[2–4] However, SARS-CoV-2 infection may induce significant changes in the host's immune response.[5,6]

We described a 4-month-old male infant with concomitant CS and SARS-CoV-2 infection. He was admitted to our Paediatric COVID Unit because of SARS-CoV-2 positivity. Both parents were already SARS-CoV-2 positive. Infant's past medical history was unremarkable until the onset of a rash at the age of 2 months. Diagnosis of atopic dermatitis was made and topical hydrocortisone and oral antihistaminics were prescribed for 1 month. Because of the lack of improvement, he received oral betamethasone (10 days) and then a hydrolysed milk, with again no improvement. At hospital admission, he presented inappetence and extreme irritability, with lesions affecting the whole body surface, including scalp, with red papules, excoriation, erythrodermia, nail dystrophy and fissures in soles and palms (Fig. 1a). He was off therapy since about 2 weeks. During the hospital stay, mother revealed an erythematous papular eruption with scratching and excoriations on arms and abdomen. She reported similar lesions in infant's grandmother lasting 3 months.

This history and the characteristics of lesions drew our attention to a possible skin infestation. Dermoscopy of skin scrapings of the infant revealed numerous scabies mites and eggs, confirmed by optical microscopic examination of scraped scales. A diagnosis of CS was made, while mother received diagnosis of ordinary scabies. Laboratory investigation revealed a severe hypereosinophilia (Fig. 1c) and high serum IgE (2592 IU/mL, normal reference value <15). Screening for immunodeficiency was negative. Lymphocyte subset panel showed a slightly low NK cells (5%, normal value 7–13). The infant was treated with oral antihistamine, topical permethrin 5% and urea 5% on hyperkeratotic palmoplantar surfaces for 1 week, with no clinical and laboratory response. An off-label treatment with oral ivermectin (200 μg/kg/dose twice a day, at days 1 and 8) was started. An improvement was observed after the third dose of ivermectin, with a complete resolution of lesions and normalization of blood test within 2 weeks (Fig. 1b,c). No recurrence of scabies or atopic dermatitis was observed during the 4-month post-discharge follow-up. As for family members, mother