At 6 weeks from initiation of treatment, the patient had more severe disease and development of psoriatic nail disease (Fig. 1a). He was commenced on calcipotriol ointment (Dovonex®; LEO Laboratories) and acitretin, which brought about marked improvement in his skin. He completed 3 months of acitretin with good results, at which point the drug was discontinued. Accelerated elimination of teriflunomide was not required due to the good response to treatment.

In postmarketing surveillance of teriflunomide, which was licensed in the European Union in 2013, there was evidence for a potential causal role of teriflunomide in new onset and worsening of psoriasis in patients. The prodrug of teriflunomide, leflunomide, is also known to be associated with the development of psoriasis.[4] Compared with the other published case reports of teriflunomide-induced pustular psoriasis, our patient developed pustular psoriasis within days rather than weeks, but otherwise the cases were similar, in that they all occurred in patients in their fifties without any personal or family history of psoriasis.

This case contributes a further example of this uncommon AE of teriflunomide. As it can take 2 years for this drug to be fully eliminated from the body, it is important to be aware of psoriasis in this patient population and recognize the availability of accelerated elimination schedules to limit patient exposure to the drug if their disease is proving difficult to treat.

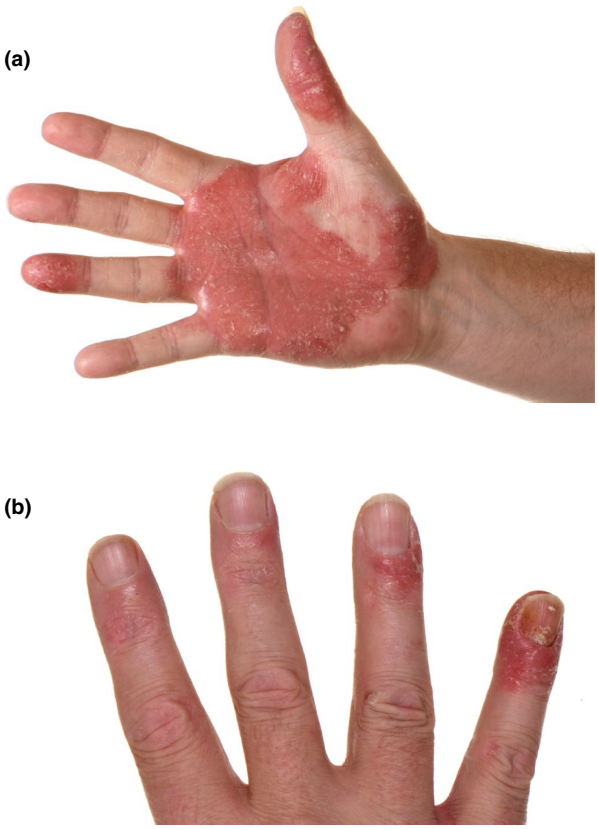

Figure 1 (a) Pustular psoriasis on the hand; (b) nail involvement.

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Evaluating the safety and efficacy of COVID-19 vaccination in patients with hidradenitis suppurativa

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Dear Editor,
The three popular COVID-19 vaccines authorized under the US Food and Drug Administration emergency use are BNT162b2 (Pfizer/BioNTech), mRNA-1273 (Moderna) and Ad26.COV.2.S (Johnson & Johnson). Clinical trials showed support for the safety and efficacy of COVID-19 vaccines among healthy participants; however, immunocompromised patients and those with specific underlying conditions were excluded,[1–3] therefore, studies

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among these groups are needed. Hidradenitis suppurativa (HS) is a chronic inflammatory skin disorder that causes abscesses in intertriginous areas and is known to have significant inflammatory burden that leads to systemic manifestations.[4] HS is of interest as both the disease process and common drug therapies may cause immune system dysregulation. The aim of this study was to investigate the safety and efficacy of COVID-19 vaccines among patients with HS.

A retrospective cohort study using a multicentre research network (TriNetX, Cambridge, MA, USA), was used to identify adult patients with HS receiving at least one injection of the COVID-19 vaccine before 15 August 2021. This cohort was then compared with a control vaccinated cohort without HS. To balance baseline cofounding demographics and comorbidities, 1 : 1 propensity score matching was used. Risk for immediate anaphylaxis along with adverse events of special interest (AESI) and all-cause hospitalization at 30, 60 and 90 days was assessed using risk ratios with 95% CI to measure safety. Risk for COVID-19 breakthrough infection at 30, 60 and 90 days was examined using hazard ratios that was estimated using the proportional hazard model to measure efficacy. A subgroup analysis was conducted on patients with HS with a 1-year history of systemic antibiotics or tumour necrosis factor (TNF) inhibitors. Further information regarding the methodology is detailed elsewhere.[5]

In total, 1 279 188 vaccinated patients were identified, of whom 3418 had prior HS. Compared with the control cohort, the HS cohort was younger and had higher numbers of black patients, female patients and patients with coexisting comorbidities (Table 1). The percentage of patients with HS receiving any dose of the BNT162b2, mRNA-1273 and Ad26.COV.2.S vaccines was 83%, 14.5% and 2.5%, respectively. After matching, the risk for any outcome between HS and non-HS vaccinated patients was not significantly different (Table 2). Similarly, there was no significant difference in any assessed outcome among matched patients with HS with or without a 1-year history of systemic antibiotics or TNF inhibitors.

This is the first large-scale study to investigate the safety and efficacy of COVID-19 vaccines among patients with HS, and the results show that patients with HS are not at any higher risk for any vaccine-related adverse outcomes. Furthermore, patients with HS on systemic medications within 1 year of being vaccinated have similar outcomes to those not receiving medications, demonstrating that anti-inflammatory/immunosuppressive therapy should not be viewed as a contraindication to vaccination. Although the prevalence of adverse events is rare, it can be concluded that COVID-19 vaccines are most likely safe and effective among patients with HS, even among those on systemic medications. As HS comorbidities are shown to be associated with worse COVID-19 outcomes,[5] avoiding vaccination may pose greater risks in patients with HS and comorbidities.

The limitations of this study are intrinsic to databases based on electronic medical records. The impact of HS severity or vaccine-induced nonspecific symptoms could not be examined and possible errors in coding entry may

Table 1 Baseline characteristics before and after propensity score matching.[a]

	Before propensity matching			After propensity matching		
Characteristic	HS (*n* = 3418)	No HS (*n* = 1 275 770)	SMD	HS (*n* = 3416)[b]	No HS (*n* = 3416)	SMD
Age, years; mean ± SD	46.01 ± 16.39	52.15 ± 20.19	0.33	46.01 ± 16.39	46.47 ± 16.8	0.08
BMI (> 30), *n* (%)	1151 (33.7)	159 666 (12.5)	0.52	1149 (33.7)	1198 (35)	0.03
Female sex, *n* (%)	2657 (77.74)	711 801 (55.79)	0.48	2655 (77.72)	2674 (78.28)	0.01
Race, *n* (%)						
Black/African American	1520 (44.47)	180 730 (14.17)	0.71	1518 (44.44)	1530 (44.79)	< 0.01
White	1516 (44.35)	843 321 (66.1)	0.45	1516 (44.38)	1514 (44.32)	0.001
Comorbidities, *n* (%)						
Essential (primary) HTN	1761 (51.52)	313 590 (24.58)	0.58	1759 (51.49)	1773 (51.9)	< 0.01
Neoplasms	1642 (48.04)	245 778 (19.27)	0.64	1640 (48.01)	1662 (48.65)	0.01
CLRD	1260 (36.86)	138 386 (10.85)	0.64	1258 (36.83)	1253 (36.68)	< 0.01
Diabetes mellitus	1041 (30.46)	127 733 (10.01)	0.53	1039 (30.42)	1025 (30.01)	< 0.01
Ischaemic heart disease	476 (13.93)	95 212 (7.46)	0.21	475 (13.91)	453 (13.26)	0.02
Chronic kidney disease	333 (9.74)	55 900 (4.38)	0.21	333 (9.75)	331 (9.69)	< 0.01
Heart failure	288 (8.43)	41 398 (3.25)	0.22	287 (8.4)	267 (7.82)	0.02
Nicotine dependence	948 (27.74)	61 667 (4.83)	0.65	946 (27.69)	937 (27.43)	< 0.01
Alcohol dependence	76 (2.22)	10 513 (0.82)	0.11	76 (2.23)	55 (1.61)	0.05

BMI, body mass index; CLRD, chronic lower respiratory disease; HS, hidradenitis suppurativa; HTN, hypertension. [a]The assessed baseline characteristics among patients with HS and controls are shown in this table; each cohort underwent 1 : 1 propensity score matching analysis to balance each cohort by demographics (age, sex and race) and comorbidities (diabetes mellitus, essential HTN, CLRD, chronic kidney disease, nicotine dependence, alcohol dependence, heart failure, ischaemic heart disease, BMI and neoplasms. [b]The algorithm used for propensity score matching excluded two patients from the HS group, as these two patients were difficult to match given their unique combination of demographics and comorbidities.

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Table 2 COVID-19 vaccination-associated adverse events before and after propensity matching.

AEs	HS (n = 3418)	No HS (n = 1 275 770)	RR or HR[a,b]	95% CI	P	HS (n = 3416)	No HS (n = 3416)	aRR or aHR[a,a]	95% CI	P
Acute AE (1 day), % (n/N)	≤ 10[c]	0.1 (742/1 275 770)	–		–	≤ 10[c]	≤ 10[c]	–		–
AESI, % (n/N)[d]						≤ 10[c]	≤ 10[c]			
30 days	≤ 10[c]	0.1 (1098/1 203 737)	–		–	≤ 10[c]	≤ 10[c]	–		–
60 days	≤ 10[c]	0.2 (2095/1 203 737)	–		–	≤ 10[c]	≤ 10[c]	–		–
90 days	0.5 (15/2948)	0.3 (3175/1 203 737)	1.93[a]	1.16–3.2	0.01	0.5 (15/2947)	0.4 (11/3007)	1.39[a]	0.64–3.02	0.40
All-cause hospitalization, % (n/N)										
30 days	1 (33/3418)	0.4 (5437/1 275 770)	2.27[a]	1.61–3.18	< 0.001	1 (33/3416)	1.1 (36/3416)	0.92[a]	0.57–1.47	0.72
60 days	1.7 (57/3418)	0.8 (9713/1 275 770)	2.19[a]	1.69–2.84	< 0.001	1.7 (57/3416)	1.7 (59/3416)	0.97[a]	0.67–1.39	0.85
90 days	2.5 (86/3418)	1.1 (13 586/1 275 770)	2.36[a]	1.92–2.91	< 0.001	2.5 (86/3416)	2.4 (82/3416)	1.05[a]	0.78–1.41	0.76
COVID-19 breakthrough infection, % (n/N)[e]										
30 days	0.5 (17/3129)	0.2 (2538/1 228 713)	2.34[b]	1.45–3.77	< 0.001	0.5 (17/3127)	0.3 (11/3154)	1.51[b]	0.71–3.23	0.28
60 days	0.6 (18/3129)	0.3 (3147/1 228 713)	1.82[b]	1.14–2.89	0.01	0.6 (18/3127)	0.3 (11/3154)	1.60[b]	0.75–3.38	0.22
90 days	0.6 (20/3129)	0.3 (3652/1 228 713)	1.65[b]	1.07–2.56	0.02	0.6 (20/3127)	0.4 (14/3154)	1.37[b]	0.69–2.71	0.37

AESI, adverse event of special interest; aHR, adjusted hazard ratio; aRR, adjusted risk ratio; HR, hazard ratio; HS, hidradenitis suppurativa; RR, risk ratio. [a]RR/aRR was calculated for acute AE, AESI and all-cause hospitalization was calculated while [b]HR/aHR was calculated for COVID-19 breakthrough infection. [c]Results ≤ 10 had details obscured to protect patient privacy and thus analysis could not be performed. [d]Patients with a prior history of AESI were excluded from this analysis. [e]Patients with a prior history of COVID-19 infection were excluded from this analysis.

have existed. Further studies examining the influence of HS severity on outcomes and longer follow-up times are warranted.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:
Data S1 Additional information.

Comment on 'Effects of the COVID-19 pandemic on head lice and scabies infestation dynamics: a population-based study in France'

doi: 10.1111/ced.15135

Linked article: Launay T *et al*. *Clin Exp Dermatol* 2021; doi:10.1111/ced.15054.

Dear Editor,
We read with interest the article by Launay *et al*. published recently in *Clinical and Experimental Dermatology*.[1]

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