Incidence and prognosis of COVID-19 in patients with psoriasis on apremilast: a multicentre retrospective cohort study

Editor,

Exacerbated systemic signs/symptoms, including respiratory distress, with SARS-CoV-2 infection (COVID-19) have been linked to a disruption in the balance of pro- and anti-inflammatory cytokines.[1] The effect of immunomodulatory therapies on the clinical course of COVID-19 remains under investigation. Limited studies report no increase in incidence of infection or risk of developing severe COVID-19 symptoms in patients with psoriasis treated with biologic agents.[2–5] Apremilast is an oral phosphodiesterase-4 inhibitor approved for the treatment of chronic plaque psoriasis, psoriatic arthritis and Behcet's disease. Contrary to patients' concerns about the use of immunomodulatory agents during the COVID-19 pandemic, data from three Canadian dermatology practices showed that patients did not discontinue apremilast due to such concerns.[6] The risk of contracting SARS-CoV-2 in patients receiving apremilast treatment, however, remains unknown. Accordingly, we aimed to quantify the proportion of patients with psoriasis who contracted COVID-19 during treatment with apremilast.

Upon approval by the Research Ethics Board, this multicentre retrospective study was undertaken at five academic and five community dermatology practices in Canada. Inclusion criteria were patients ≥18 years of age with plaque or pustular psoriasis treated with apremilast. Data were collected between 25 January 2020 (one documented COVID-19 case and zero deaths in Canada) and 30 April 2021 (1 211 083 cumulative COVID-19 cases and 24 169 deaths in Canada). Data were retrospectively obtained from patient support programme (PSP) case managers of apremilast and/or patient-reported outcomes documented by their dermatologist. In Canada, 100% of patients are enrolled in PSPs and followed indefinitely during apremilast treatment.

Among the 402 identified patients receiving apremilast, there were no documented COVID-19 cases. These results demonstrate that apremilast use for psoriasis did not increase the risk of contracting SARS-CoV-2 infection compared to the general Canadian population (incidence of 3.2% as of 30 April 2021). Our data are consistent with phase 3 randomized controlled trials, which have demonstrated that lower respiratory tract infections are rare with both, short- and long-term, apremilast treatments.[7]

The reduced rate of SARS-CoV-2 infection may be due to closer adherence to public health guidelines by patients on immunomodulatory therapy or a higher number of asymptomatic carriers who did not undergo COVID-19 testing in this cohort. Mechanistically, given that apremilast downregulates expression of pro-inflammatory cytokines known to be released with SARS-CoV-2, such as tumour necrosis factor-alpha (TNF-α), interleukin (IL)-17 and IL-23,[8] it is possible that use of this oral small molecule may decrease the risk of a cytokine storm associated with SARS-CoV-2 infections. As a result, patients on apremilast who contract COVID-19 may be less likely to develop associated severe complications.[9,10] Consistent with this hypothesis, apremilast had the lowest SARS-CoV-2 infection rate compared to biologic therapies in a Spanish cohort of patients with psoriasis.[1]

Currently, there are no evidence-based guidelines to instruct clinicians on the use of apremilast during the COVID-19 pandemic. Our data suggest that discontinuation of apremilast treatment out of concerns for contracting SARS-CoV-2 infection is not supported. In fact, cessation of therapy may lead to a flare of the condition being treated. Our study is limited by the rare chance that patients chose not to report a positive COVID-19 test result, relatively small sample size and a retrospective design. Moreover, our data lacked an age-, sex- and diagnosis-matched control group, which limits our comparison to the general Canadian population. Finally, demographic information, composition of comorbidities and differences in protective behaviours that patients on immunosuppression may undertake were not collected and may have an impact on our findings. Overall, it appears that apremilast does not increase susceptibility to SARS-CoV-2 infection in patients with psoriasis and can be considered a safe immunomodulatory therapy for this patient population during the pandemic.

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Conflict of interest

Dr Devani has been an advisor, consultant, speaker and/or investigator for AbbVie, Amgen, Arcutis, Bausch Health, Boehringer Ingelheim, Bristol Myers Squibb, Celgene, Concert, Dermavant, Dermira, Eli Lilly, Galderma, GSK, Incyte, Janssen, LEO Pharma, Novartis, Pfizer, Regeneron, Sanofi Genzyme, Sun Pharma, Tribute and UCB. Dr Gooderham has been an advisor, consultant, speaker and/or investigator for AbbVie, Amgen, Akros, Arcutis, Boehringer Ingelheim, Celgene, Dermavant Sciences, Inc., Dermira, Eli Lilly, Galderma, GlaxoSmithKline, Janssen, Kyowa Kirin, LEO Pharma, MedImmune, Merck, Novartis, Pfizer, Regeneron, Sanofi Genzyme, UCB and Valeant (Bausch Health). Dr Jain has been an advisor and/or speaker for Abbvie, ALK-Abelló A/S, Celgene, LEO Pharma, Medexus, Mylan, Novartis, Pfizer and Sanofi Genzyme. Dr Lansang has been an advisor, consultant and/or speaker for AbbVie, Amgen, Celgene, Eli Lilly, Janssen, LEO Pharma, Novartis and Valeant. Dr Vender has been an advisor, consultant, speaker and/or investigator for Amgen, AbbVie, Astellas, Bausch Health/Valeant, BMS, Boehringer

Ingelheim, Celgene, Dermira, Eli Lilly, Galderma, GSK, Janssen, LEO Pharma, Merck (MSD), Merck Serono, Novartis, Pfizer, Regeneron, Roche, Sanofi-Aventis/Genzyme, Sun Pharma, Takeda and UCB. Dr Prajapati has been an advisor, speaker, consultant and/or investigator for AbbVie, Actelion, Amgen, Aralez, Arena, Arcutis, Aspen, Bausch Health, Boehringer Ingelheim, Bristol Myers Squibb, Celgene, Cipher, Concert, Dermira, Eli Lilly, Galderma, GlaxoSmithKline, Homeocan, Incyte, Janssen, LEO Pharma, Medexus, Novartis, Pediapharm, Pfizer, Regeneron, Sanofi Genzyme, Sun Pharma, Tribute, UCB and Valeant. Dr Yeung has been an advisor, consultant, speaker and/or investigator for AbbVie, Allergan, Amgen, Arcutis, Astellas, Bausch Health, Boehringer Ingelheim, Bristol Myers Squibb, Celgene, Centocor, Coherus, Dermavant, Dermira, Forward, Galderma, GlaxoSmithKline, Incyte, Janssen, Kyowa, LEO Pharma, Lilly, MedImmune, Merck, Novartis, Pfizer, Regeneron, Roche, Sandoz, Sanofi Genzyme, Sun Pharma, Takeda, UCB, Valeant (Bausch Health) and Xenon. Dr Lytvyn, Dr Georgakopoulos and Dr Mufti have no conflicts of interest to disclose.

Ethical approval

Ethical approval was granted by the Research Ethics Board at Sunnybrook Health Sciences Centre (2016-0540) and Women's College Hospital (2016-0072-E).

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Comment on 'Development of eruptive pseudoangiomatosis following COVID-19 immunization-apropos of 5 cases': could eruptive pseudoangiomatosis represent a paraviral eruption associated with SARS-CoV-2?

To the editor,

We read with great interest the recently published letter on your journal 'Development of eruptive pseudoangiomatosis following COVID-19 immunization-apropos of five cases',[1] as we have just