Correspondence

Young HIV-positive male patient with severe atopic dermatitis on dupilumab and SARS-CoV-2 infection, a pioneer hypothesis

Dear Editor,

During the global pandemic by the new severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2), dupilumab has been preferred for treating severe atopic dermatitis (AD) because IL-4 and IL-13 are not related to host defense against viral respiratory infections,[1] although little is known about the safety of all immunosuppressants and biologics in this clinical picture. We present a young male patient living with human immunodeficiency virus (HIV) being treated with dupilumab for severe AD, recently diagnosed with coronavirus disease 2019 (COVID-19). There is a persistent concern about the role of biologics and immunosuppressants in higher risk patients and severity of COVID-19. Moreover, it is still unknown how HIV interacts with the novel virus.

We present a 27-year-old male with allergic rhinitis and HIV for 5 years, who attends our atopic dermatitis (AD) clinic in Bogotá, Colombia. He has a life-long history of severe AD not responsive to conventional topical nor systemic treatment, including phototherapy, azathioprine, and methotrexate, so dupilumab was prescribed in July 2019. He is currently on antiretroviral therapy (ART); his last viral load was undetectable, and the $CD4^+$ count was 600 cells/ul.

In late June 2020, the patient presented with odynophagia and cough with a positive polymerase chain reaction (PCR) test for SARS-CoV-2, which was considered mild and did not require hospitalization. After teledermatology evaluation following our institutional protocol,[2] he continued dupilumab, with periodic evaluations by telenursing, and telemedicine previous to each application. After 1 week, the symptoms resolved with no additional medication. Nowadays, the patient is asymptomatic and does not present a decline in his $CD4^+$ cells count. Additionally, he did not have an AD flare during or after the disease, registering mild clinical parameters (SCORAD: 8, EASI: 1, DLQI: 4, POEM: 4).

There is scarce information about the immunopathogenesis of the coinfection with SARS-CoV-2 in HIV patients. It is known that dysfunction and a decline in lymphocytes and natural killer cells is present during COVID-19, which may worsen the altered immune system in people living with HIV (PLWHIV). However, it has been reported that the immune response, evolution, and prognosis of COVID-19 are variable and related to the ART, time of diagnosis, and viral suppression.[3]

PLWHIV and those who suffer acquired immunodeficiency disease related to HIV have a biased composition of their lymphocytes toward T helper 2 (Th2), even when $CD4^+$ cell counts are normal and viral load is undetectable during ART. In this scenario, the immune system is healthier but not normal; therefore, HIV-infected patients are prone to suffer from Th2-related diseases.[4]

Interestingly, dupilumab might regulate the abnormal Th2-biased immune system of PLWHIV, and we consider it might be safe for treating severe AD.[5] Furthermore, we hypothesize it could be used for treating some of the Th2-mediated diseases compromising the skin, in order to prevent Th2-driven immune hyperactivation. Further research on T lymphocyte activation during inflammatory diseases in HIV patients will allow the use of this medication in patients presenting this clinical picture.

Our patient has been treated for several months with dupilumab with adequate control of severe AD, no adverse events, and his $CD4^+$ count has been stable, even throughout simultaneous SARS-CoV-2 infection.

In conclusion, given the widespread COVID-19 pandemic, physicians may encounter severe atopic dermatitis patients with both COVID-19 and HIV infection. We provide a novel experience of an IL-4Rα subunit inhibitor used to treat severe AD in a PLWHIV infected with SARS-CoV-2, supporting the hypothesis that this therapy is not related with higher risk of severe infection or worse prognosis with COVID-19. This is an opportunity for larger studies to reliably confirm this hypothesis.

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