

## Case Report

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## Annular Pustular Psoriasis Triggered by ChAdOx1nCoV-19 Vaccine: a case report and review of literature

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## Abstract

A 58-year-old Brazilian patient presented with an annular pustular outbreak and systemic symptoms three days after ChAdOx1nCoV-19 vaccination. The patient had a diagnosis of severe plaque psoriasis and two previous pustular flares adequately controlled with the use of Ustekinumab every 12 weeks during the last two years. To the best of our knowledge, pustular flares of psoriasis following ChAdOx1nCoV-19 vaccination have not been reported so far. At 2022, it was published a case report of de novo generalized pustular psoriasis after ChAdOx1nCoV-19.

**Key Words :** Psoriasis, COVID-19 Vaccines

## Introduction

Psoriasis is a systemic immune-mediated inflammatory disorder whose pathophysiology shares genetic and environmental factors promoting a dysregulation of cytokines and a T cell-mediated response. Some factors are well-established triggers, such as medications, infections and emotional stress. Vaccination is an unusual trigger, but the potential association between vaccination and the new-onset or flares of psoriasis has been previously described with different vaccines such as hepatitis B and influenza. In the specific context of generalized pustular psoriasis (GPP), few case reports describing pustular outbreaks following vaccination have been reported and only two reports, including this case, described flares after COVID19 vaccination, specifically Sinovac and ChAdOx1nCoV-19 vaccines [1-4]. In addition, there is one description of plaque psoriasis flare after COVID-19 Pfizer-BioNTech BNT16B2b2 mRNA vaccine. To date, no case reports have been published describing the exacerbation of pustular psoriasis after vaccination with ChAdOx1nCoV-19. At 2022, it was published a case report of de novo generalized pustular psoriasis after ChAdOx1nCoV-19 [5, 6].

## Case Report

A 58-year-old Brazilian woman was admitted two weeks after an outbreak of annular generalized pustular lesions and systemic symptoms initiating three days after the first dose of ChAdOx-

1nCoV-19 vaccine. The patient has arterial hypertension, diabetes mellitus type II and obesity.

Clinical examination revealed generalized pustules on annular ill-defined areas of erythema and edema affecting the trunk, upper and lower limbs and systemic symptoms including malaise, nausea and asthenia.

The previous history of the patient included a diagnosis of plaque psoriasis at the age of 36 and two previous episodes of GPP: the first pustular outbreak occurred during the third trimester of pregnancy at the age of 38 which was treated with both topical and systemic steroids and spontaneous labour of a healthy infant at 40 weeks; the second flare occurred three years later after an infection of the upper airways while she was under treatment with 20 mg/week of oral methotrexate. At this time, acitretin 30mg/day was started with rapid control of pustular lesions but only partial control of her plaque psoriasis after two years of continuous treatment. In October 2019, the patient was started on Ustekinumab 45 mg with almost complete control of her psoriatic plaques. In April 2020 she presented with headache, fever and sore throat and COVID19 infection was diagnosed by PCR. At this point, treatment included only symptomatic medication such as paracetamol and no exacerbation of psoriatic lesions was observed until May 2021, when the first dose of the ChAdOx1nCoV-19 vaccine was

applied and, three days after, a new episode of GPP initiated. She did not have a recent infection or history of systemic drug use. The patient was managed with the regular dose of Ustequinumab 45 mg administered at the same day of admission and evolved with complete regression of pustular lesions and systemic symptoms 7 days after. No recurrences were observed during the next month of follow-up.

### Discussion

Until now, psoriasis flares have been reported after Bacillus Calmette-Guerin (BCG), tetanus diphtheria, pneumococcal polysaccharide, hepatitis B, influenza and more recently after the

COVID19 vaccines, such as Sinovac and COVID-19 Pfizer-BioNTech BNT16B2b2 mRNA vaccine and ChAdOx1nCoV-19 [4-9].

The main clinical manifestations are guttate and guttate-plaque variants, although other presentations have already been described, such as psoriasis-like eruptions, psoriatic arthropathy, and plaque psoriasis<sup>1, 2,3</sup>. GPP outbreaks following influenza, hepatitis B vaccination and intravesical bacillus Calmette-Guérin immunotherapy have been reported 7- 13 (Table 1). Pustular flares after COVID19 vaccination have included one de novo case after COVID-19 ChAdOx1nCoV-19 vaccine and one case after Sinovac vaccines (Table 2) [5, 6].



Table 1: Generalized pustular psoriasis flares after vaccination (excluding COVID19 vaccines)

Vaccine	Influenza <sup>11</sup>	Hepatitis B <sup>10</sup>	BCG intravesica <sup>12</sup>
Age	59 years	26 years	80 years
Sex	male	female	male
Time between vaccination and flare	2 days	10 days	6 weeks
Outcome	Almost complete regression after systemic steroids (60 mg daily)	Complete regression after topical corticosteroids	Regression after 6 weeks of ciclosporine 5mg /kg/day. Another flare 4 months later, resolved by addition of metotrexato 10 mg/week to ciclosporine. Ciclosporine was stopped after 8 months by renal injury, without recurrence of lesions.

**Table 2: Pustular Psoriasis flares after COVID19 vaccination**

Vaccine	Sinovac <sup>5</sup>	ChAdOx1nCoV-19 (presented case)	ChAdOx1nCoV-19
Clinical type of psoriasis	Pustular psoriasis	Pustular psoriasis - flare	Pustular psoriasis – de novo
Age	72 years	58 years	66 years
Sex	male	female	male
Days between vaccination and flare	4	3	21
Outcome	Complete regression after intra-venous infliximab infusion at 5 mg/kg	Complete regression after Ustequinumab 45 mg	Regression after acitretine 20 mg/d
Previous history of Covid infection	No	Yes (without flare)	No

Our patient is the first report of a pustular flare in a patient with previous diagnosis of psoriasis occurring three days after the first dose of the ChAdOx1nCoV-19 vaccine. At 2022, it was published a case report of de novo generalized pustular psoriasis after ChAdOx1nCoV-19.

Further side-effects attributed to the ChAdOx1nCoV-19 vaccine have included tiredness, local tenderness, pain, bruising at the site of injection, headache, muscle and joint pain, nausea and fever [14].

Many COVID-19 vaccines as triggers of psoriasis exacerbation are being reported [15-19] Two patients had psoriasis exacerbation after Pfizer-BioNTech and Moderna vaccines in a trial of 414 patients with cutaneous reactions [18]. De novo generalized pustular psoriasis after AstraZeneca-Oxford COVID-19 vaccine was also reported [9]. A recent study evaluated 51 psoriasis patients after covid vaccination and observed fifteen exacerbations within  $9.3 \pm 4.3$  days after the dose [19].

Vaccination may be a triggering factor for de novo or flare of psoriasis, as mention in other case reports and studies. The intervals between vaccination and exacerbation, the exclusion of medication and infection symptoms as another possible triggers supports the vaccine as the cause in our patient.

The exactly mechanism between COVID-19 vaccines and exacerbation of psoriasis is not elucidated, but some theories could be made. ChAdOx1nCoV-19 vaccine are based on adenovirus as vector or mRNA. In addition, some studies describe an increase in tumor necrosis factor (TNF)- $\alpha$  and interferon (IFN)- $\gamma$  production by CD4+ T cells after ChAdOx1nCoV-19 vaccine [20] what are recognized as proinflammatory cytokines of the inflammatory cascades of psoriasis [21,22]. Other studies suggested that IL-6 and Th17 are also present at the immune response in covid 19 vaccines [23-25]. Despite the description of psoriasis flares after vaccination, there is no evidence of interference in the effectiveness of immunization in patients using immunobiologicals yet, and the benefits of the vaccine should not change the immunization practice, mainly for patients with psoriasis undergoing immunosuppressive and/or biological therapy [1].

Considering the COVID19 pandemic, the expansion of immunization and different vaccines, it is extremely important to describe and monitor these as a potential triggers for flares or new onset of psoriasis.

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### Conflict of interest

*Livia Maria Oliveira Salviano has no conflict of interest*

*Bruno Jose Breda has no conflict of interest*

*Ricardo Romiti, MD, is/has served as a scientific consultant, speaker, or clinical study investigator for AbbVie, Boehringer Ingelheim, Galderma, Janssen-Cilag, Eli-Lilly, Leo-Pharma, Novartis, Pfizer, TEVA, and UCB*

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