

Guttate Psoriasis Flare Following the Third Dose of mRNA COVID-19 Vaccine in a 36-Year-Old Male: A Case Report

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ABSTRACT

Background: Psoriasis is a chronic, immune-mediated skin disease known to flare in response to various environmental and immunologic triggers, including infections, stress, medications, and vaccinations. With the global rollout of COVID-19 vaccines, rare instances of psoriatic eruptions have been reported. This study aimed to report the case of guttate psoriasis flare following the third dose of mRNA COVID-19 vaccine in a 36-year-old male.

Case Presentation: We report the case of a 36-year-old male with a history of guttate psoriasis that occurred seven years prior, which resolved spontaneously without recurrence. The patient had remained disease-free until five days after receiving a third (booster) dose of an mRNA COVID-19 vaccine, when he developed a sudden, widespread eruption of erythematous, drop-like papules and small plaques, predominantly involving the trunk and extremities. Initial management with topical corticosteroids yielded minimal response. Skin biopsy revealed histopathological features consistent with psoriasis. The patient was subsequently started on low-dose methotrexate, resulting in significant clinical improvement within four weeks.

Conclusion: This case highlights the possibility that mRNA COVID-19 vaccination may, in rare cases, trigger guttate psoriasis even in individuals with a remote history of the disease and prolonged remission. While vaccination remains a crucial public health intervention, healthcare providers should remain aware of potential cutaneous adverse events and provide prompt, individualized management to maintain both optimal patient care and public vaccine confidence.

Keywords: Covid-19 vaccine, guttate psoriasis, psoriasis flare, vaccine-induced psoriasis

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BACKGROUND

Psoriasis is a chronic, immune-mediated inflammatory skin disease affecting approximately 2–3% of the global population. It is characterized by the hyperproliferation of keratinocytes and dysregulation of innate

and adaptive immune responses, particularly involving Th1 and Th17 pathways (Armstrong & Read, 2020). Guttate psoriasis, a less common clinical variant, typically presents in younger adults as multiple small, drop-like erythematous plaques with

silvery scales. It is frequently triggered by upper respiratory tract infections, especially streptococcal pharyngitis, and can also be induced by psychological stress, certain medications, or vaccinations (Al-Beltagi et al., 2022; Gananandan et al., 2020).

Since the widespread implementation of COVID-19 vaccination programs, various cutaneous adverse events have been documented (Soewondo et al., 2021). These range from mild injection site reactions to more complex immunologically mediated eruptions, including urticaria, erythema multiforme, and exacerbation of autoimmune dermatoses (McMahon et al., 2021). Notably, a growing number of reports have emerged linking COVID-19 vaccines—particularly mRNA-based platforms to both *de novo* onset and flare-ups of pre-existing psoriasis (Potestio et al., 2023; Sotiriou et al., 2021).

Although these vaccines have been largely safe and effective, their immunostimulatory nature may act as a trigger in genetically predisposed individuals. Recent evidence from a systematic review analyzing 134 post-vaccination psoriasis cases highlighted guttate psoriasis as one of the most frequently reported variants among both new-onset and relapsed forms (Potestio et al., 2023). Other reported morphologies include plaque-type, pustular, erythrodermic, and nail psoriasis, emphasizing the spectrum of vaccine-associated presentations (Greb et al., 2016; Nair & Badri, 2025; Song et al., 2022).

Immunopathogenic mechanisms proposed for these adverse events focus on the activation of innate immune receptors, particularly Toll-like receptors 7 and 9 (TLR7 and TLR9), by mRNA vaccine components. This activation results in elevated type I interferon production and increased levels of proinflammatory cytokines such as

IL-36 γ and CXCL8, which are known contributors to psoriatic inflammation (Lehmann et al., 2021; Song et al., 2021). The observed overlap in cytokine signatures between psoriasis and vaccine-induced immune activation supports the hypothesis of molecular mimicry or bystander activation as potential triggers (Sbidian et al., 2019).

Importantly, recent studies have noted that individuals not receiving systemic immunosuppressive or biologic therapy are more likely to experience vaccine-induced flares, possibly due to unmitigated immune activation (Sotiriou et al., 2021). Additionally, data suggest that certain HLA subtypes and polymorphisms in IL23R and TNFAIP3 genes may modulate susceptibility to post-vaccination cutaneous autoimmunity, although these findings remain preliminary (Karampinis et al., 2024). Understanding host factors is critical in stratifying risk and guiding post-vaccine monitoring strategies in psoriasis patients.

While most available data pertain to reactions following the first or second vaccine doses, fewer reports have addressed delayed flares occurring after booster doses. A recent observational study from 2024 described five cases of psoriasis exacerbation after the third (booster) dose, suggesting a cumulative or sensitization effect in certain individuals (Karampinis et al., 2024; Potestio et al., 2024). Given the global push for periodic boosters, especially among high-risk populations, there is a need for heightened clinical awareness regarding delayed immunologic reactions, including in those previously well-controlled or in remission.

In this context, we report a case of guttate psoriasis flare in a 36-year-old male following the third dose of an mRNA COVID-19 vaccine. The case underscores the potential for delayed cutaneous

immune responses and contributes to the evolving understanding of vaccine-associated psoriasis. Enhanced surveillance and dermatologic vigilance are essential in identifying and managing such reactions promptly.

CASE REPORT

A 36-year-old Indonesian male presented to our dermatology clinic with multiple erythematous, scaly, drop-shaped papules and plaques distributed on the trunk, upper, and lower extremities. The lesions appeared 5 days after he received the third dose of an mRNA COVID-19 vaccine, which was otherwise well tolerated with no systemic adverse effects.



Figure 1. Physical findings from local status examination (dermatological status)

The patient had a known history of chronic plaque psoriasis since the age of 27, previously well-controlled with intermittent topical corticosteroid therapy. He had not experienced any major flares in the past two years and reported no recent upper respiratory tract infections, new medications, or stressors.

Physical examination revealed multiple monomorphic guttate papules with fine scale. Auspitz sign was positive. There was no evidence of nail involvement or psoriatic

arthritis. PASI score was estimated at 6.4. Laboratory investigations, including ASO titer, CBC, liver and renal function tests, were within normal limits. A 4-mm punch biopsy taken from a representative lesion showed features consistent with psoriasis: regular acanthosis, parakeratosis, Munro microabscesses, and a perivascular lymphocytic infiltrate in the upper dermis. Initial treatment with medium-potency topical corticosteroids (mometasone furoate 0.1% cream) for 2 weeks provided only mild

improvement. Due to persistence and progression of the lesions, the patient was started on low-dose oral methotrexate (initial dose 10 mg/week, increased to 15

mg/week), with folic acid supplementation. At 4-week follow-up, significant improvement in scaling and erythema was observed.

Table 2. Physical Examination

Parameter	Result
General Condition	Mild
Consciousness / GCS	Compos mentis / E4V5M6
Respiratory Rate	18 breaths/minute
Pulse	88 beats/minute, regular
Blood Pressure	120/80 mmHg
Temperature	36.5 °C
O ₂ Saturation	100%
Height	164 cm
Weight	64 kg
Body Mass Index	23.8 kg/m ²
Head	Neck
• Normocephalic • Alopecia (–) • Anemic conjunctiva (–) • Icteric sclera (–) • Pupils: round and isochoric	• Lymph node enlargement (–) • Use of accessory respiratory muscles (–) • Tenderness (–)
Thorax	Heart:
• Symmetrical (+) • Retraction (–) • Chest deformity (–) • Blackish spots on back (+)	• S1S2 regular • Murmur (–) • Gallop (–)
Lungs:	Abdomen
• Inspection: symmetrical (+/+), chest deformity (–), scar (–), reddish-black spots spreading (+) • Palpation: symmetrical (+/+), crepitation (–), tenderness (+) • Percussion: sonor (+) • Auscultation: vesicular (+/+), wheezing (–), rhonchi (–)	• Inspection: distended (–) • Auscultation: bowel sounds (+) • Percussion: tympanic (+) • Palpation: tenderness (+), mass (–)
Extremities	
• Warm acral (+) • Edema (–) • Deformities (–) • CRT < 2 seconds	

DISCUSSION

This case involves a 36-year-old male with previously well-controlled chronic plaque psoriasis who developed guttate-like flare five days after a mRNA vaccines booster,

with no alternative triggers (negative ASO titers, no infection, medications, or stress). The temporal proximity, histopathologic confirmation, and lack of other

precipitators strongly suggest a vaccine-related flare.

Psoriasis is a chronic, immune-mediated skin disease with both genetic predisposition and environmental triggers. Psoriasis is a long-lasting inflammatory and hyperproliferative skin disorder, typically marked by red, scaly plaques with silvery-white scales. These lesions commonly appear on the extensor areas of the limbs, the scalp, and the lower back. Guttate psoriasis typically follows *Streptococcus pyogenes* infections, particularly in children and young adults. Although well-recognized triggers include bacterial infections (e.g., strep throat), vaccines such as influenza, BCG, and hepatitis B have also been implicated. (Nair & Badri, 2025). In addition to skin involvement, psoriasis can also impact the joints and eyes. Although it is a manageable condition, there is currently no cure, and the disease often follows a relapsing-remitting course with unpredictable flare-ups. Although exceedingly rare, vaccination has been reported to precipitate psoriasis onset or exacerbate existing disease in susceptible individuals (Karampinis et al., 2024).

Recent systematic reviews show that cases of psoriasis onset or flare following COVID-19 vaccination are increasingly reported. In a large review including over 400 cases, mRNA vaccines were frequently associated with exacerbations or new-onset psoriasis, with flares occurring mostly within 1–30 days post-vaccination. One smaller systematic review noted 62 exacerbations and 11 new-onset cases, many linked to increased IL-6 and Th17 immune responses. Importantly, mRNA vaccine booster doses also appear capable of triggering flares in previously stable patients (Wu et al., 2022).

mRNA vaccines induce strong Th1 and Th17 responses, which can theoretically drive psoriatic inflammation. Toll-like receptors (TLR7/9) may detect vaccine mRNA or adjuvants, activating plasmacytoid dendritic cells and increasing interferon-I, TNF- α , IL-6, IL-36 γ , and chemokines such as CXCL8—all implicated in psoriasis pathogenesis. Lehmann et al. (2021) reported high expression of MX1—a marker of type I interferon activation—in lesional skin of patients with post-vaccine guttate psoriasis, supporting this mechanism.

Standard topical corticosteroids produced only modest improvement; low-dose methotrexate led to resolution within four weeks, aligning with other case reports and expert recommendations for more persistent or widespread post-vaccination flares. While most vaccine-related flares are mild to moderate, a case-control study of 322 psoriasis patients found just 2% experienced flares post-vaccination, and those receiving biologic therapy had significantly fewer flares (33% vs. 66%) (Burlando et al., 2023; Wu et al., 2022).

Genetic susceptibility plays a pivotal role in psoriasis pathogenesis. Individuals with HLA-C*06:02 and other psoriasis-linked alleles may harbor latent immune dysregulation that remains subclinical until triggered by environmental or immunological stressors. COVID-19 vaccination, particularly mRNA-based vaccines, may unmask this predisposition through robust stimulation of innate and adaptive immunity. In our case, the patient had a history of mild chronic plaque psoriasis, suggesting a background of susceptibility, and the vaccination likely acted as a precipitating factor leading to a guttate flare. This phenomenon of latent psoriasis being triggered post-immunization is supported by multiple

reports, particularly in genetically predisposed individuals (Berna-Rico et al., 2023; Huang & Tsai, 2021; Karampinis et al., 2024).

Psychological stress is a recognized exacerbating factor for psoriasis via neuro-endocrine and immune mechanisms, including increased cortisol levels, altered sympathetic tone, and promotion of pro-inflammatory cytokines (Hunter et al., 2013). During the COVID-19 pandemic, increased anxiety related to infection risk, isolation, and vaccine-related uncertainty may have contributed to immune dysregulation in some individuals. Although our patient denied experiencing significant stress, subclinical psychological stress cannot be ruled out as a co-contributor. A 2022 study in *Frontiers in Immunology* emphasized that stress-induced neuroimmune changes may synergize with vaccine-induced immune activation to disrupt epidermal homeostasis in psoriasis patients (Zhang et al., 2024).

It is essential to differentiate guttate psoriasis from other post-vaccine exanthems, including pityriasis rosea-like eruptions, viral exanthema, or vaccine-induced lichenoid reactions. Histopathologic examination in our case revealed classic psoriasiform epidermal hyperplasia, parakeratosis, and neutrophils in the stratum corneum (*Munro microabscesses*), confirming the diagnosis. The biopsy ruled out other papulosquamous diseases, supporting the attribution to psoriasis rather than a non-specific vaccine rash. Accurate histologic diagnosis is crucial for guiding therapy and reassuring patients (Tran et al., 2022). Recent studies indicate that patients on TNF- α , IL-17, or IL-23 inhibitors not only tolerate COVID-19 vaccination well but may experience fewer flares compared to non-biologic patients (Liu et al., 2024; Railton et al., 2024).

Future booster doses, preemptive therapeutic strategies, or spacing immunizations in high-risk individuals is needed to maintain robust dermatologic pharmacovigilance. Post-marketing surveillance systems like VAERS (U.S.), EudraVigilance (EU), and VigiBase (WHO) are critical for capturing rare cutaneous adverse events such as vaccine-induced psoriasis. Establishing dedicated psoriasis registries for post-vaccine flares could help delineate incidence, risk factors, and clinical outcomes. Clinicians are encouraged to report suspected adverse events to appropriate authorities to enhance data collection and inform clinical guidelines (Wu et al., 2022).

This case report, while contributing to the growing body of literature on vaccine-induced cutaneous adverse events, is subject to several limitations. First, causality cannot be definitively established due to the observational nature of the report. Although the temporal association, histopathological confirmation, and absence of other known triggers (e.g., streptococcal infection, new medications, or significant psychological stress) strongly suggest a link between the mRNA COVID-19 vaccine and the guttate psoriasis flare, this remains a clinical inference rather than a proven mechanistic relationship (Wu et al., 2022).

Second, the lack of immunological or molecular profiling limits our understanding of the exact pathways involved. Biomarkers such as type I interferons, IL-36 γ , or T-cell subset analysis were not performed, which could have provided mechanistic insights into the immune activation pathway specific to the post-vaccination state. Future case series or cohort studies incorporating immunologic assays and genetic screening would help

elucidate the pathophysiology more clearly (Lehmann et al., 2021).

Third, this report represents a single patient experience, which limits the generalizability of the findings. While similar cases have been described in the literature, most evidence remains anecdotal or limited to small case series. Population-based studies or prospective dermatology-vaccine safety registries are needed to assess the true incidence, severity spectrum, and risk factors for post-vaccine psoriasis flares (Potestio et al., 2023, 2024).

Fourth, follow-up was relatively short, focusing only on the acute flare and early response to methotrexate. Long-term outcomes such as recurrence with subsequent vaccinations, sustained remission, or potential progression to chronic forms of psoriasis were not captured. This restricts our ability to assess prognosis or long-term treatment needs.

Lastly, the potential underreporting of mild or self-limited vaccine-induced skin reactions must be considered. Many patients with transient post-vaccination rashes may not seek dermatologic care, leading to an underestimation of the phenomenon. Thus, the apparent rarity of guttate psoriasis flares post-vaccination may be, in part, a reflection of under-detection rather than true incidence.

Despite rare reports like this, the overall benefit risk profile of COVID-19 vaccination remains overwhelmingly favorable. Prospective cohort studies, pharmacovigilance data analyses, and immunologic profiling are needed to evaluate incidence, dose-response relationships, and risk stratification especially among booster dose recipients or those off biologic therapy. Psoriasis, including guttate flare risk, should not preclude vaccination. This case underscores the potential for mRNA COVID-19 vaccines to

trigger guttate psoriasis in genetically predisposed individuals. Dermatologists should be aware of such rare cutaneous adverse events and manage them promptly to ensure continued public confidence in vaccination programs.

AUTHORS CONTRIBUTION:

VMS prepared the case report, introduction, and discussion, as well as submitted the manuscript. IWH and IGAARM contributed to the interpretation of the results and further refined the discussion. AA drafted the abstract, translated the manuscript, and finalized the references.

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CONFLICT OF INTEREST

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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