

Reactive Arthritis Following Vaccination against COVID-19: An Unexpected Adverse Reaction

Dear Editor,

The COVID-19 pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has created unprecedented havoc worldwide. Use of masks, hand hygiene, social distancing, vaccination, and eventual herd immunity are understood to be the only lifeguards. Although indispensable, COVID-19 vaccination has had its own share of adverse effects, with fever, injection-site pain, headache, urticarial, and delayed-type hypersensitivity reactions being most commonly reported.^[1] Rare side effects include autoimmune inflammatory diseases, such as thrombocytopenia, vasculitis, Rowell syndrome, and Sweet's syndrome.^[1] Recently, cases of seronegative arthritis secondary to COVID-19 vaccine have been reported, and a single case with concurrent cutaneous features.^[2,3] We report second case of reactive arthritis (ReA) with classical mucocutaneous and joint involvement following the vaccine, with one-year follow up and non-recurrence of symptoms.

A 21-year-old male student presented to dermatology outpatient department with extensive red raised lesions over the body for the past one month, starting over lower limbs and rapidly progressing to involve both upper limbs and trunk. Pain and swelling were present in multiple joints, including bilateral knee, ankle, shoulder, and sacro-iliac joints. He denied history of urethral discharge, burning micturition, sexual activity, gut infection, loose stools, or sore throat. However, he reported taking the first dose of COVID-19 vaccination (Oxford-AstraZeneca adenovirus ChAdOx1) seven days prior to onset of lesions.

On examination, bilaterally symmetrical, hyperkeratotic, hyperpigmented, discoid and rupioid plaques with heaped up crusts, discrete and coalescing, were present all over the body, relatively sparing the face, scalp, flexures, palms, and soles [Figure 1]. Annular erythematous plaques with slightly raised borders, suggestive of circinate balanitis, were seen over glans penis [Figure 2]. The left knee and right ankle joints were swollen, warm and tender. Ophthalmological examination was within normal limits.

Gram stain and culture of urethral swab smear did not show presence of any organism. Human leucocyte antigen (HLA-B27) was negative while C-reactive protein and erythrocyte sedimentation rate (ESR) were raised (90mg/L and 30mm/h respectively). Blood picture revealed leukocytosis (13,000/mm³) with neutrophilia (85%). HIV, hepatitis B&C serology, venereal disease research laboratory (VDRL), chlamydia and neisseria urinary polymerase chain reaction tests were negative. X-ray

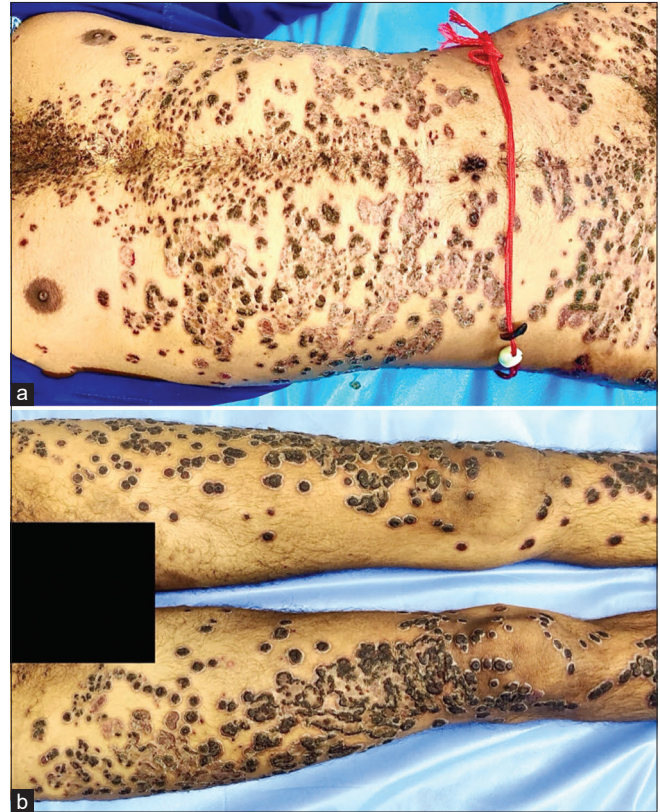


Figure 1: Bilaterally symmetrical, hyperkeratotic, hyperpigmented, discoid and rupioid plaques present over trunk (a) and lower limbs (b)

knee, ankle and sacro-iliac joints showed tissue swelling with joint effusion. Knee joint aspirate was sterile and MRI revealed bone marrow edema in bilateral femur and tibia (right > left) with bilateral joint effusion, synovitis and surrounding myositis in left knee. Anti-SARS-CoV-2 antibodies were positive, while nasopharyngeal and oropharyngeal swabs tested negative. Histopathological examination showed psoriasiform epidermal hyperplasia with spongiosis and dermal inflammatory infiltrate, suggestive of acute psoriasiform reaction.

Thus, diagnosis of ReA following COVID-19 vaccination was made. In view of debilitating pain and difficulty while walking, sulfasalazine 1 g/day was initiated along with topical clobetasol propionate 0.05% ointment and an emollient for skin lesions. Amoxicillin-clavulanate was administered to eliminate secondary bacterial infections. In contrast to the usually prolonged and debilitating course of ReA, our patient responded quite rapidly with resolution of all skin lesions and joint complaints within 12 weeks, barring slight pain in the left knee [Figure 3]. One year follow up revealed continued remission, without any flare-ups.



Figure 2: Circinate balanitis over glans penis

ReA, earlier eponymously known as Reiter's disease, is a seronegative spondyloarthropathy which occurs as a reactive response to a variety of organisms in susceptible hosts and diagnosed by ACR criteria.^[4] This sterile joint inflammation is classically associated with gastrointestinal and urogenital infections, although it can be triggered by many other infections, most recent addendum being the SARS-CoV-2 infection.^[5] However, vaccination, such as BCG and influenza vaccines are other possible etiology. Furthermore, few cases highlighted COVID-19 vaccination as a cause of seronegative arthropathy.^[2,3] Simultaneous cutaneous and joint involvement is very rare.

Two main mechanisms are implicated in development of ReA: (a) "antigen-specific" immune response by molecular mimicry, wherein similarity between vaccine components and human proteins result in cross-reactivity, and yields an autoimmune process; and (b) "non-specific" response, in which autoreactive T or B cells get activated in an antigen-independent manner.

Our patient was a young male with classical cutaneous features of ReA, such as rupioid plaques, circinate balanitis and urethritis along with oligoarthritis of large joints and inflammatory backache with temporal correlation of one week post vaccination. Though two-thirds of ReA patients are HLA-B27 positive, our

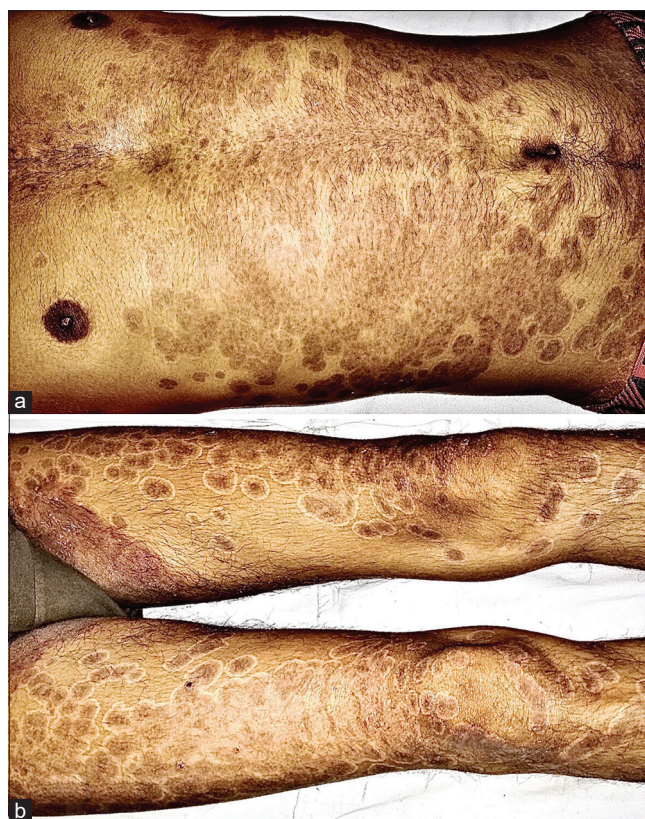


Figure 3: Resolution of all plaques at 8 weeks post treatment with lesions showing peripheral hypopigmentation and central hyperpigmentation over trunk (a) and lower limbs (b). Tinea cruris was appreciated after clearing of ReA plaques (b)

patient tested negative. However, genetic susceptibility is responsible not for the onset of the disease, but only for its chronicity.^[4]

Vaccination is one of the safest and effective approaches to battle COVID-19 pandemic, along with hygiene maintenance. Even though certain adverse reactions have been reported post vaccination, severe ones like autoimmune reactions constitute <0.01%.^[1] Thus, one should be more vigilant in patients with history of autoimmunity, but can still be advised vaccination similar to general population, against the deadly COVID-19 disease.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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References

1. Velikova T, Georgiev T. SARS-CoV-2 vaccines and autoimmune diseases amidst the COVID-19 crisis. *RheumatolInt* 2021;41:509-18.
2. An QJ, Qin DA, Pei JX. Reactive arthritis after COVID-19 vaccination. *Hum VaccinImmunother* 2021;17:2954-6.
3. Lebowitz E, Kim JS, Magro C. Reactive arthritis following COVID-19 vaccination with BNT162b2. *JAAD Case Rep* 2022;24:108-11.
4. Selmi C, Gershwin ME. Diagnosis and classification of reactive

arthritis. *Autoimmun Rev* 2014;13:546-9.

5. Saricaoglu EM, Hasanoglu I, Guner R. The first reactive arthritis case associated with COVID-19. *J Med Virol* 2021;93:192-3.

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