

# Vaccine-induced Dermatomyositis following COVID-19 Vaccination

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Kouki chaima and Amouri mariem performed the collection of data and wrote the paper; Bouzid sana performed critical revision and final approval of article; Sellami Khadija and Bahloul Emna analyzed data; and Rekik ariem and baklouti massara analyzed data; and revise the paper; Boudaya Sonia and Masmoudi Abderrahan revised the final manuscript. Hamida Turki performed and approved the final manuscript revision.

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**Dear editor:**

With the worldwide vaccination campaign against the COVID-19 pandemic, a constant increase of cutaneous and extracutaneous adverse effects have been reported. Various immune-mediated diseases (IMD) flares or new disease onset after SARS-CoV2-vaccination has been described.<sup>1</sup> A few cases of Dermatomyositis (DM) /polymyositis (PM) after immunization with different vaccines have been reported in patients with possible genetic predisposition.

Herein, we describe a new onset of DM in one patient few days after vaccination with mRNA COVID-19 vaccine.

**Case:**

A 52-year-old female was referred to our department for the sudden occurrence of erythematous itchy skin rash. She received the first dose of BNT162b2 mRNA COVID-19 vaccination seven days before the onset of the eruption. The patient had chronic renal failure (CRF) and hypertension. She denied any family history of autoimmune diseases or consanguinity. There were no previous infectious symptoms or new drug exposure. She complained about abdominal pain, nausea, vomiting and fever. Polyarthralgia and myalgia had rapidly led to a difficulty in rising from a chair, than washing her hair or dressing on her own and finally to an inability to walk. Examination revealed an erythematous-papular rash all over her face, trunk, and hands with V-shaped on her neckline. (figure.1) There was a symmetrical and proximal muscle weakness in both upper and lower limbs with normal tone and reflexes.

Blood analysis showed: elevated C-reactive protein of 248 mg/L (>5 mg/L), increase in aspartate aminotransferase (AST) of 68U/L (<30 U/L), in serum creatine kinase (CPK) of 484 mcg/L (120mcg/L) level and lactate dehydrogenase (LDH) of 519 U/L (222 U/L). Anti-nuclear antibody (ANA) and anti-SAE-1 antibody were positive while anti-Jo-1 and anti Mi-2 were negative.

A skin biopsy performed, from the patch on the arm revealed mild epidermal atrophy and a perivascular lympho-eosinophilic infiltrate in the papillary dermis. Electromyography of the left quadriceps muscle increased spontaneous and insertional activity with fibrillation potentials, early recruitment, and small polyphasic motor potentials. A thoraco-abdomino-pelvic CT scan revealed no evidence of neoplasia.

The diagnosis of DM following BNT162b2 mRNA COVID-19 vaccination was established. Systemic corticosteroids were prescribed and the patient was started on prednisolone 1mg/kg per day. The rash disappeared and a significant improvement in her muscular strength was noted within 30 days.

### **Discussion:**

DM is a rare idiopathic inflammatory myopathy that affects adults and children, mostly female. The pathophysiology remains unknown, but immune mechanisms play an important role. <sup>2</sup>

A large number of cases of DM have been reported following multiple vaccines including hepatitis B virus, bacillus Calmette-Guérin (BCG), tetanus, influenza, smallpox, polio, diphtheria, diphtheria-pertussis-tetanus. <sup>1,3</sup>

Recently, new-onset autoimmune phenomena after COVID-19 vaccination have been increasingly described (e.g. immune thrombotic thrombocytopenia, autoimmune liver diseases, Guillain-Barré syndrome, IgA nephropathy, rheumatoid arthritis and systemic lupus erythematosus). <sup>4</sup>

The immune response generated by COVID-19 vaccination results in activation of inflammatory cells and production of cytokines. COVID-19 mRNA vaccines elicit CD4 type 1 helper T cell (Th1) responses. <sup>5</sup>

Vaccine-induced autoimmunity is caused by molecular mimicry between host cell and antigen or directly by vaccine adjuvant, as in autoimmune/inflammatory syndrome induced by adjuvant (ASIA). <sup>6</sup>

In fact, increased levels of interferon gamma (IFN- $\gamma$ ), interleukin-2 and tumor necrosis factor-alpha (TNF- $\alpha$ ) have been observed after vaccination. Similarly, we observed high level of type I interferon-inducible genes in muscle fibers, endothelial cells, skin, and peripheral blood in patients with DM. <sup>2,3</sup>

To the best of our knowledge, six previous cases of post-COVID-19 vaccine myositis and one case of DM were reported. <sup>6</sup>

Through this case report, we underline the importance of the high degree of clinical suspicion of both typical and atypical presentation of DM induced by COVID-19 vaccine.

Although,

it is possible that the appearance of DM after COVID vaccination in our patient was coincidental, the onset of symptoms so soon after the first dose, complete resolution within a few weeks and no subsequent recurrence suggest a true association in this case.

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Figure legend:

Figure 1A: marked facial edema, especially in the periorbital and malar areas with lilac-coloured.

Figure 1B: Gottron papules on the hands: multiple purpuric reddish papules the dorsum of the patient's metacarpophalangeal and interphalangeal joints.

Figure 1C: papular-purpuric exanthema.

Figure 1D: purpuric annular erythematous macules over the left palm

A

Accepted Article





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