

Dermatomyositis Post COVID-19 Vaccine: A Case Report

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Abstract

Dermatomyositis (DM) is a rare systemic autoimmune disease characterized by symmetrical and predominantly proximal muscle weakness in the limbs, associated with typical skin lesions. Autoimmune diseases have already been described as an adverse effect of vaccines. Case-report: A 65-year-old Caucasian female patient evolved, 5 days after the first dose of the AZD1222 vaccine against the COVID-19 virus, with skin lesions suggesting heliotrope and Gottron's sign, with partial improvement of the condition with use of topical glucocorticoids in the lesions. After two months, the patient received the second dose of AZD1222 vaccine, and evolved with proximal muscle weakness of upper and lower limbs, dysphagia, increase of muscle enzymes, in addition to skin lesions compatible with heliotrope and Gottron's sign again. After treatment with pulse therapy with methylprednisolone 1000 mg per day for three days and treatment with immunosuppressants, she evolved with significant clinical improvement. Conclusions: This case-report demonstrating an important chronological relationship between dermatomyositis and the vaccine AZD1222 alerts to the possibility of the disease as an important adverse reaction of vaccine against COVID-19 virus, as has been recently described by other authors.

Keywords

COVID-19, Vaccine, Dermatomyositis, Systemic Autoimmune Myopathies

1. Introduction

Dermatomyositis (DM) is a rare systemic autoimmune disease characterized by symmetrical, progressive and predominantly proximal muscle weakness in the limbs, associated with typical skin lesions such as heliotrope and Gottron's sign. DM can present at any age, and has a higher incidence in females compared to

males. The cause of DM is unknown, but it is believed to be multifactorial, involving the interaction of genetic and environmental factors [1]. Infections, immunodeficiencies and other external factors such as vaccines could act in genetically predisposed individuals, favoring changes in immunoregulatory mechanisms responsible for the manifestations of the disease.

The progressive growth of registered cases of COVID-19 in the world generated immense concern from the authorities and since the beginning of 2021 when the vaccination program started, side effects have been reported in clinical trials [2].

Among the adverse effects induced by the vaccines, some that have been reported include autoimmune diseases like myocarditis, vaccine-induced immune thrombotic thrombocytopenia and leukocytoclastic vasculitis [3].

In this report, we will describe a case report of a patient who developed dermatomyositis after receiving the ChAdOx1 nCoV-19 (AZD1222) vaccine.

2. Case Report

A 65-year-old caucasian female patient was admitted in April 2021 to our service, located in Sao Paulo, reporting that, 5 days after the first dose of the AZD1222 vaccine against the COVID-19 virus, she evolved with new cutaneous lesions. The lesions were characterized as periorbital and facial edema, associated with violaceous skin lesions on the eyelids (**Figure 1**) and scaly lesions on the dorsal surface of the fingers (**Figure 2**), suggesting heliotrope and Gottron's



Figure 1. Violaceous skin lesions on the eyelids, compatible with heliotrope.



Figure 2. Scaly lesions on the dorsal surface of the fingers, compatible with Gottron's sign.

sign, respectively. She sought medical attention, which recommended the use of topical glucocorticoids in the lesions, with partial improvement of the condition. After two months, in June 2021, the patient received the second dose of AZD1222 vaccine, evolving with muscle weakness in upper and lower limbs, joint pain, especially in the shoulders, dyspnea on small efforts progressive and, finally, dysphagia, accepting only liquid diet. In addition, she presented again with the presence of skin lesions compatible with heliotrope and Gottron's sign. In the emergency care of our service, the diagnostic hypothesis of dermatomyositis was realized. The patient's laboratory tests showed anemia with hemoglobin of 10.7 mg/dl with an iron profile compatible with chronic disease anemia, increased muscle enzymes with creatine phosphokinase (CK) of 2822 U/L, aspartate aminotransferase of 150 U/L and alanine aminotransferase of 51 U/L. She also has a slight increase in evidence of inflammatory activity C-reactive protein and erythrocyte sedimentation rate. ANA and antibodies specific for autoimmune inflammatory myopathies were negative. Serology for HIV, hepatitis B and C, and syphilis were negative. The patient was evaluated by the dermatology team, who performed a biopsy on the skin lesion on the fifth left phalanx, confirming the diagnosis. Pulse therapy with methylprednisolone 1000 mg per day for three days was initiated, and after the pulse therapy, she started to receive methotrexate 15 mg weekly, associated with hydroxychloroquine 5 mg per kilogram daily, prednisone 40 mg daily and symptomatic drugs, with significant clinical improvement, on outpatient return, after 3 weeks of treatment induction.

3. Discussion

To date, this is one of the first case-reports to describe dermatomyositis after vaccination against COVID-19 virus.

In December 2019, the Chinese Center for Disease Control and Prevention reported several cases of pneumonia of unknown cause. The first complete identification of the genome of the new virus was completed in January 2020, initially being called 2019-nCoV and later being renamed to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), with the disease caused by the virus becoming known as coronavirus disease 2019 (COVID-19). The COVID-19 can generate asymptomatic conditions to serious illness and death [4].

Brazil is among the countries with the highest numbers of confirmed cases and deaths from SARS-CoV-2 since the beginning of the pandemics. Vaccination is essential to reduce morbidity and mortality in these patients [5].

Until recently, little was known about efficacy and safety in patients with rheumatologic diseases, as the vast majority of vaccine studies excluded patients with these comorbidities. A recently published article carried out at a tertiary center in Brazil demonstrated slightly lower post-vaccination seroconversion in patients with autoimmune diseases, but with satisfactory safety and no reports of serious side effects [6].

On the other hand, there is an increase in the number of case reports of au-

toimmune diseases discovered soon after vaccination, and questions are being asked about it, because so far, there is no way to prove if they were just coincidence or if they had a true temporal and causal relationship with the vaccine.

Cases such as leukocytoclastic vasculitis, myocarditis/pericarditis, Kawasaki disease, Sweet's syndrome, autoimmune thrombocytopenia and numerous other case reports that are associated with the vaccine against COVID-19 and autoimmune diseases have been described in the literature [7] [8] [9] [10] [11].

Some cases of post-vaccination dermatomyositis are being published recently [12] [13] [14] [15], which raise the suspicion that this relation is not just a coincidence. In these cases, the disease-associated vaccines were AZD1222 (Astra-Zeneca), mRNA 1273 (Moderna) and Biotech (Pfizer). As in the majority of reported cases, the patient of this case report was an elderly woman with good response after induction treatment, demonstrating a possible good prognostic of dermatomyositis induced COVID-19 vaccine. Unlike other reported cases, the patient of this case report developed skin lesions suggestive of heliotrope and Gottron's sign, typical lesions of dermatomyositis, in addition to joint involvement, with arthralgia.

Previously, some cases of DM were reported after vaccination against hepatitis B and Influenza [16] [17] [18]. Although, in the phase III study of AZD1222 vaccine there were no reports of post-vaccination autoimmune phenomena, this study demonstrated efficacy of 74.0% against COVID-19, with few serious adverse effects, the most common adverse events being auto-limited generalized pain, headache, pain at the injection site and fatigue [19].

Among the potential triggers, viruses have the potential to break down tolerance and trigger an immune inflammatory myopathy [20]. During the COVID-19 pandemic, there is evidence that more than 10% of patients infected with COVID-19 develop myopathic symptoms with myalgia, weakness, and elevated CK, but until recently there were no reports of COVID-19 infection or vaccines for COVID-19 as triggers for the onset of dermatomyositis [18]. The mechanisms of autoimmune phenomena after vaccination may be analogous to those that occur after natural infections, so the justification may be based on molecular mimicry, epitope dissemination and disorderly activation of the immune system [21].

4. Conclusion

The low incidence of DM makes the analysis between vaccines and the onset of the disease difficult, but based on the temporal relationship between onset of the clinical case described and the administration of the vaccine doses shows a very likely cause-and-effect association, although, unquestionable proof of causality in humans would require larger future epidemiological studies.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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