Relapse of microscopic polyangiitis after vaccination against COVID-19: a case report

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Relapse of microscopic polyangiitis after vaccination against COVID-19: a case report

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ABSTRACT

After the approval of the first vaccines against SARS-CoV-2, a mass vaccination is currently being performed worldwide. Despite the safety and efficacy of such drugs evidenced by the registration studies, no clinical trial has to date included patients affected by autoimmune diseases nor data coming from real life are currently available. In this regard, we report the case of a patient affected by microscopic polyangiitis who suspended Methotrexate prior to vaccination and relapsed after the administration of the first dosage. The patient required hospitalization and was treated with high dosages of steroids but was rapidly discharged in good clinical condition. Our case evidences that the immune response triggered by the administration of the vaccine against COVID 19 may reactivate autoimmune disorders, but such condition seems manageable and the withdrawal of the immunosuppressants should not be performed.

INTRODUCTION

Approval of the first vaccines against SARS-CoV-2 has dramatically changed the prospects of controlling COVID-19. According to the first available data, these vaccines appear effective and safe, but no clinical trials have included patients with rheumatic diseases, and no data exists on efficacy and safety in such subjects.

CASE REPORT

In this regard, we report the case of a 77-year-old male, who presented with necrotic ulcers of the lower limbs in September 2020. In August he had suffered an acute episode of mild-to-moderate dyspnea, followed by hematuria and lower limb purpura. Dyspnea and hematuria resolved rapidly after self-administration of glucocorticoids, whereas purpura worsened, eventually leading to large ulcers. Blood chemistry showed slight elevation of C-reactive protein (CRP) and serum creatinine, while urinalysis showed proteinuria and hemoglobinuria.

Autoimmunity blood tests were all negative, whereas skin biopsy was compatible with leukocytoclastic vasculitis. A diagnosis of microscopic polyangiitis was eventually made and the patient was treated with prednisone, tapered slowly to 6.25 mg/day, and methotrexate (MTX) 15 mg/week, which led to prompt and complete resolution of skin involvement.

After 4 months of treatment, the patient, by now considered to be in remission, was called for vaccination against COVID-19 and he decided to temporarily suspend MTX. A few days after the first shot of BioNtech/Pfizer Comirnaty, he experienced severe, rapidly worsening dyspnea and presented at the emergency unit. Arterial blood gas analysis showed severe hypoxemia (pO2 48 mmHg) and low oxygen saturation, while blood chemistry showed elevation of CRP (3.7 mg/dl) and creatinine (1.55 mg/dl), in addition to hemoglobinuria. Lung function tests showed severe restrictive deficit and severe reduction of diffusing capacity of the lung for carbon monoxide (DLCO<35%). High-resolution computed tomography (HRCT) of the chest showed diffuse “ground-glass” opacities with superimposed septal thickening and subpleural consolidations (Fig. 1).

The patient required high-flow oxygen (12 l/min, FiO2 50%) and was treated with piperacillin/tazobactam and high-dose intravenous methylprednisolone. After 7 days of hospitalization, the patient was eupneic and no longer required oxygen. Blood chemistry showed normalization of CRP (0.11 mg/dl) and creatinine (1.1 mg/dl) and the patient was discharged in good clinical condition. Nasopharyngeal swab for SARS-CoV-2 remained negative, as well as both IgM and IgG, performed one month after the vaccination. HRCT showed radical rapid improvement of consolidations and ground-glass opacities, suggesting resolution of vasculitis (Fig. 2).

DISCUSSION

At the present time, four vaccines against COVID-19 have been authorized by the European Medicines Agency.

Certain scientific societies [1-3], after experience with many other non-live vaccines, do not preclude vaccination of rheumatic patients, nor do they suggest the need to withdraw immunosuppressive treatment, except for rituximab. At the same time, like for any other

vaccination, patients to be vaccinated should preferably have low disease activity and a stable dose of immunosuppressants.

It is well known that many autoimmune rheumatic diseases may be triggered by infectious stimuli, particularly viruses [4]. Another major trigger may be vaccines themselves: vaccines may even trigger different subsets of diseases, particularly in immune-compromised and/or elderly subjects [5].

It is therefore not surprising that SARS-CoV-2 may trigger the development and/or relapse of certain autoimmune disorders, including vasculitis. To the best of our knowledge, few papers have reported cases of COVID-induced vasculitis in adulthood: these have usually concerned IgA-related [6, 7], ANCA-associated [8, 9] or large-vessel forms [10-12]. Presentation may be extremely variable and, in cases of lung involvement, the differential diagnosis between idiopathic vasculitis and COVID-19 may be challenging [8, 9]. On the other hand, there have not yet been any reports of cases of patients whose rheumatic condition has worsened or even relapsed after vaccination against COVID-19.

The present case report describes the first immune-related adverse event due to Comirnaty in a rheumatic patient considered to be in remission. Relapse presented without skin involvement, but with severe worsening of lung involvement, leading to immediate hospitalization and oxygen therapy. Fortunately, recovery was rapid, and the patient did not require any immunosuppressants other than glucocorticoids.

This case shows that the immune response elicited by vaccination against COVID-19 may reactivate autoimmune disorders such as vasculitis. The physio pathological mechanisms have not been fully understood; nevertheless, we may hypothesize that vaccination, through the production of antibodies against SARS-CoV2 spike glycoprotein, eventually cross-reacting against host peptides [13], may trigger pre-existing aberrant immune mechanisms [14]. In case of ANCA-associated vasculitis, auto-antibodies production and neutrophils and complement activation both lead to vascular damage and vasculitis relapse.

Presentation may be severe and require hospitalization, but symptoms seem to be manageable with conventional treatments. Further data from larger cohorts will provide more robust evidence for the prevention and treatment of immune-related adverse events of COVID-19 vaccines.

The withdrawal of MTX may have been a factor in unleashing the vasculitis and an aberrant immune response in our patient. As already suggested by available guidelines [3], it may therefore be advisable not to suspend immunosuppressants, prior to vaccination.

DECLARATIONS:

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AVALAIBILITY OF DATA: Data are available upon request on corresponding Author.

AUTHOR CONTRIBUTION: EC, MD, LB and EB wrote the paper; FG and MAM performed HRCT and collected radiological images; EC and EB performed the clinical diagnosis of vasculitis; EB, LC and BF corrected the draft and supervised the work.

ETHICS: The research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

CONSENT FOR PUBLICATION: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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FIGURE LEGENDS

Figure 1 (a, b) – HRCT performed on admission to emergency care showed bilateral ground-glass opacities with superimposed septal thickening (arrows) and subpleural consolidations (arrowheads).

Figure 2 (a, b) – HRCT performed 7 days later showed significant improvement in radiological findings (arrows and arrowheads).