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Case Report

COVID-19 in Vaccinated Immunocompromised Young Man

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Abstract

We report the case of a recovered COVID-19 immunocompromised patient with severe autoimmune disease who is on several immune suppressive drugs.

His medical condition has no specific diagnosis. On 2011 he underwent total left adrenalectomy due to pheochromocytoma with trial of auto-transplant of adrenocortical tissue in the iliacus muscle. The auto-transplant failed after two years of follow-up and revealed the necessity of full hormone replacement therapy due to adrenal insufficiency. Genetic tests including whole EXOM sequencing did not revealed any known mutation related to pheochromocytoma. On 2019 he was diagnosed with Ankylosing spondylitis and optic neuritis. He was treated with high dose steroids with partial response. Therefore, Secukinumab, an interleukin 17A inhibitor, was started, with a very good clinical response initially. However, after the 6th dose, the patient developed severe urticarial vasculitis, that completely responded to Cyclosporine. Different interleukin 17A inhibitor, Ixekizumab, was initiated. However, after two injections, the patient developed urticarial rash again. Trying to cease cyclosporine use, the patient got Omalizumab with no rash recurrence. Avoiding use of TNF inhibitors for treating ankylosing spondylitis, patient started to take Upadacitinib. Six weeks after starting the treatment he was diagnosed with COVID-19 infection.

On August 2021 the patient was diagnosed with COVID-19 infection, 8 months after he received two SARS-CoV-2 mRNA vaccine with poor serologic response (COVID-19 IgG were 25 and 169 AU/ml at 4 and 6 weeks from the second vaccine injection.).

He was presented with fever of 39.0, chills, cough, mild speech dyspnea, headache, myalgia, rhinorrhea, anosmia and ageusia. During his disease he was treated with oral Prednisone 8mg, oral Fludrocortisone 0.1mg, oral Upadacitinib 150 mg and S.C Omalizumab once monthly. Treatment course of cyclosporine 300 mg was completed one week before his presentation. Due to worsening of fatigue, tachycardia (125 bpm) and borderline hypotension (blood pressure= 95/60 mmHg), he was admitted to the hospital. His vital signs at emergency room (ER) were: pulse=120 bpm; BP= 100/60 mmHg; oxygen saturation = 95% on room air; and fever= 38.5 C. ECG showed sinus tachycardia with no signs of ischemia, and chest x-ray was normal with no signs of infiltrates. On laboratory workout, he had lymphopenia (0.82 K/µl), elevated CRP 6.5 mg/dL, LDH 253 U/L and hypophosphatemia 1.2 mg/dL. Blood glucose levels, sodium, potassium and kidney function were within normal limit. 100 mg Hydrocortisone in 1 litter normal saline was administered intravenously at the ER.

His vital signs were within the normal range, and after 2 days of admission, he was discharged. COVID-19 IgG level was 30158 AU/ml on discharge.

His symptoms improved gradually, and after 10 days of admission, he back to his work as a physician in our hospital.

Keywords: COVID-19; DMARDs; Immunocompromised

To date, the main data available about COVID-19 in immunocompromised patients due to rheumatic diseases and biological or immunomodulatory drugs is controversial. On one hand, few studies surprisingly suggested that immunosuppressed therapy is not associated with severe COVID-19 infection [1]. On the other hand, some studies reported more severe respiratory disease in patients with rheumatic disease and COVID-19 infection [1]. In a cross sectional study performed in Tuscany, which had enrolled 458 patients treated with steroids or disease modifying antirheumatic drugs (DMARDs) shows that this group of patients does not manifest an increased risk of COVID-19 infection as compared to the general population [2]. Another cross-sectional study performed in Barcelona, included 959 patients with rheumatic diseases treated with DMARDs reported similar results. In addition, this group of immunosuppressed patients did not develop more severe disease or worse outcome compared to general population [3]. Monti., *et al*. reported, in a cohort of subjects affected by COVID-19, a low prevalence of patients treated with biological disease-modifying antirheumatic drugs (bDMARDs) and targeted synthetic disease modifying antirheumatic drugs (tDMARDs) [4]. These findings support the conclusion that the mechanisms underlying the severe respiratory COVID-19 complications are driven, at least in part, by the exuberant inflammatory response [5]. Conversely, a study performed in the USA in which 52 patients with rheumatic disease were matched to 104 non-rheumatic COVID-19 infected patients [6], patients with rheumatic disease and COVID-19 infection were more likely to require mechanical ventilation. However, mortality was comparable amongst the two groups [6].

The efficacy of COVID-19 vaccine in immunocompromised patients is unclear yet. The initial recommendation (as of December 2020 upon the arrival of the vaccine to Israel) was to vaccinate immunocompromised patients. However, patients with rheumatic diseases were not considered immunosuppressed [7].

With the spread of the pandemic, the number of patients exposed to DMARDs who are tested positive for COVID-19 has markedly expanded. Since the impact of background rheumatic disease on COVID-19 outcome is unclear, it is important to report about the outcome of COVID-19 infection in vaccinated immunocompromised patients due to exposure to anti rheumatic therapy.

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