Clinical Case Reports International

Case Report
Published: 16 Apr, 2021

The Administration of Tocilizumab to a COVID-19 Patient with Psoriasis Vulgaris – A Case Report

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Abstract

A case of male patient admitted to a hospital with bilateral pneumonia caused by COVID-19 is presented. It was found on admission that the patient had had psoriasis vulgaris; the patient had no therapy for six years and he had no regular checkups. Due to progression and high CT scan severity score and elevated serum IL-6, the decision was made to administer the patient tocilizumab. Upon administration, psoriatic lesions were in retreat. Even though there are some reports describing tocilizumab induced psoriasis, some studies have demonstrated a high level of IL-6 in psoriatic plaques. Therefore, therapies that disrupt IL-6 signaling could be a treatment option for psoriasis.

Case Presentation

A 38-year-old male patient was admitted to our hospital with bilateral pneumonia caused by SARS-CoV-2 infection. On admission, the patient's history showed that he had had psoriasis vulgaris for eight years. At the time of disease onset, the patient went to a dermatologist where he was prescribed methotrexate. As the patient reported, he was in remission while using this drug. However, six years ago, he stopped taking the therapy and stopped going to regular checkups. With no therapy, the disease was active again. On admission, the physical examination revealed well-demarcated, non-coherent, silvery plaques overlying a glossy homogeneous erythema on extremities and trunk.

The patient also reported fever, fatigue and cough a few days before the admission. He was prescribed vitamins and antipyretic by his general practitioner, but he was not feeling better. On the day of the admission, he was examined in our hospital and the X-ray imaging revealed bilateral pneumonia. Inflammation markers were elevated (CRP 113 mg/L) and nasopharyngeal swab was taken for a PCR analysis to a SARS-CoV-2. As a part of the regular procedure for physical examination, oximetry was performed, and the patient's peripheral oxygen saturation was about 95%, so he was given oxygen support. During the hospital stay, he was prescribed therapy as per COVID-19 guidelines and it included intravenous antibiotics, probiotics, vitamins and low molecular weight heparin. The following morning, during the regular visiting round, it was observed that the patient wasn't clinically and subjectively better, so it was decided to perform a CT scan of thorax. This diagnostic procedure confirmed bilateral interstitial pneumonia in progression with a CT severity score 17 out of 25. This score indicated that the pneumonia was severe and IL-6 blood analysis was done. Serum IL-6 was elevated (50.84 pg/mL), so our anesthesiologist coordinator was consulted about the next step. The decision was made to administer tocilizumab i.v. (in recommended dose 8 mg/kg). Two days after the administration of tocilizumab, the patient was clinically and subjectively better, inflammation markers in laboratory analysis showed a drop while the psoriatic lesions were in retreat (Figure 1). The ongoing hospital stay was without complications and the patient's peripheral oxygen saturation was about 98% without oxygen support. Ten days later, the patient was discharged from the hospital. Written informed consent for this paper and clinical images was obtained from the above-mentioned patient.

Discussion

Biologics approved for psoriasis by the United States Food and Drug Administration (FDA) includes: Etanercept, infliximab and adalimumab (all targeting TNF-α), ustekinumab (targeting IL-12/IL-23 p40), secukinumab, ixekizumab (targeting IL- 17A) and brodalumab (targeting IL-17A receptor) [1]. It is known that psoriasis pathogenesis is linked to TNF-α, IL-23, and IL-17 signaling pathways, but there are some associations to IL-6, too [2]. Serum levels of IL-6 are interpreted

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Received Date: *25 Mar 2021*
Accepted Date: *12 Apr 2021*
Published Date: *16 Apr 2021*

Citation:
Branković M, Jovanović I, Radonjić T, Bukurecki I, Zdravković M. The Administration of Tocilizumab to a COVID-19 Patient with Psoriasis Vulgaris – A Case Report. Clin Case Rep Int. 2021; 5: 1226.

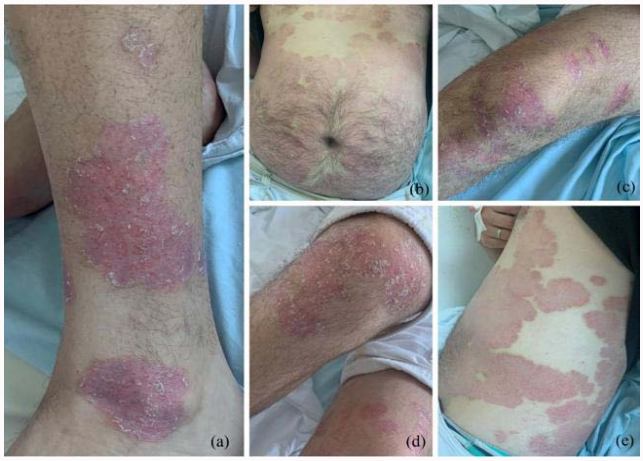

Figure 1: Clinical images. Retreat of psoriatic lesions on lower leg and ankle (a), trunk (b, e), upper leg (c) and knee (c, d), and back (e).

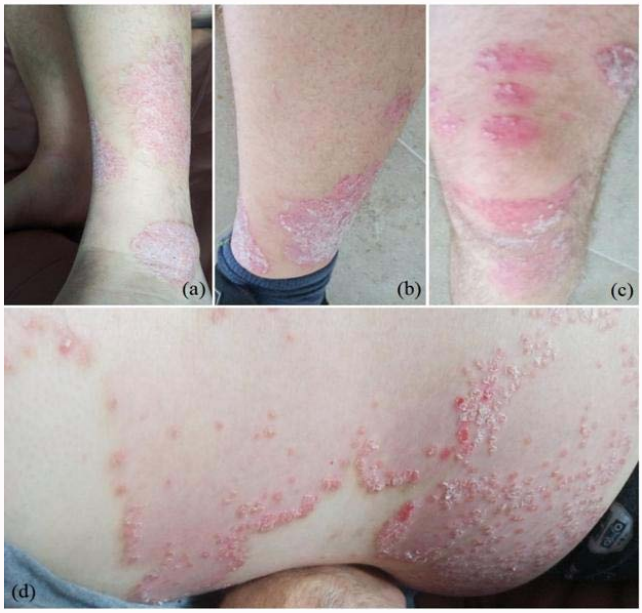

Figure 2: Images taken by the patient after 10 days of hospital discharge. Psoriatic lesions in relapse on lower leg (a, b, c), ankle (a), upper leg and knee (c), and lateral side of the abdomen (d).

as a marker of the inflammatory activity in psoriasis as well as an indicator of treatment response [2]. IL-6 is produced by a wide range of cell types in psoriatic plaques (including keratinocytes, fibroblasts, endothelial cells, DCs, and macrophages) in response to several stimuli, such as IL-1, TNF-α, IL-17 and IL-36 [2].

Tocilizumab is a humanized antihuman Interleukin-6 (IL-6) receptor antibody. It is an approved biologic medication for the treatment of rheumatoid arthritis. Several cases of tocilizumab induced psoriasis have been described do far. Studies about these unwanted events imply that approximately ten to fifteen days after the induction dose of tocilizumab, psoriatic plaques developed (skin biopsies confirmed diagnosis) [3]. Tocilizumab-induced psoriasis was suspected and the treatment was stopped while the psoriatic lesions resolved quickly with corticosteroids [3]. One report showed that after the administration of intravenous tocilizumab, as a therapy for rheumatoid arthritis, psoriatic-like lesions developed (lesion biopsy was not performed because the patient's consent was not obtained); however, on administration of subcutaneous tocilizumab on same patient, as higher doses of tocilizumab could be administered by subcutaneous injection rather than by intravenous injection, also shortening the dosing interval, psoriatic-like lesions improved [4].

On the other hand, there is a report about a young woman with juvenile idiopathic arthritis who was given etanercept but it induced psoriasiform skin lesions diagnosed by skin biopsy [5]. Because of this adverse reaction to etanercept, intravenous tocilizumab was induced in the therapy and four weeks later, an improvement was observed in the skin lesions [5]. Further, six months later, she was in clinical remission of JIA and the skin lesions had resolved [5].

Conclusion

So far, the experience with IL-6 inhibitors in psoriasis is limited, as other signaling pathways have been approved as therapeutic targets (etanercept, infliximab, adalimumab, ustekinumab, secukinumab, ixekizumab and brodalumab) [2]. Some studies have demonstrated a high level of IL-6 in psoriatic plaques, therefore therapies that disrupt IL-6 signaling could be a treatment option for psoriasis.

We contacted our patient 10 days after discharging him from the hospital to inquire about his condition, and we were told that psoriasis was relapsed again (Figures 2). The patient was advised to visit the dermatologist to be prescribed the therapy he needed. Hopefully, the patient will start with biologics and will achieve remission.

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