

Tocilizumab in Critically Ill COVID-19 Patients: Case Series

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Introduction

Coronavirus disease 2019 (COVID-19) due to Coronavirus 2 (SARS-CoV-2), previously known as 2019-nCoV infection, has quickly spread all over the globe causing a pandemic. The SARS-CoV-2 infection causes activation of lymphocytes T and macrophages, which will release cytokines such as interleukin-6 (IL-6) that bind to their specific receptors in target cells provoking a systemic cytokine release syndrome (SCRS) [1]. Which is responsible for the high mortality rate due to multiple organ dysfunction syndromes. Tocilizumab (TCZ) is a recombinant humanized monoclonal antibody that acts by SCRS, as an IL-6 receptor antagonist. However, data about the effects of TCZ on inflammatory response in these patients are limited. We reported three cases of severe COVID-19 treated by TCZ.

Keywords: COVID-19; SARS-CoV-2; Tocilizumab; Intensive care

Case report 1

Mrs L.A, a 49-years-old female with a medical history (hypertension and type 2 diabetes), was admitted to ICU for severe COVID-19, and pulmonary multiple bilateral ground-glass opacities (GGO) involving more than 50% of lung parenchyma in chest computed tomography (CT). Reverse-transcriptase polymerase chain reaction (RT-PCR) analysis of oropharyngeal swab was positive for SARS-CoV-2. Initial treatment was based on oxygenation, chloroquine, azithromycin, without improvement. Hence a single 400 mg dose of TCZ was administrated. After two days, we observed an improvement in the clinical and biological characteristics (Figure 1).

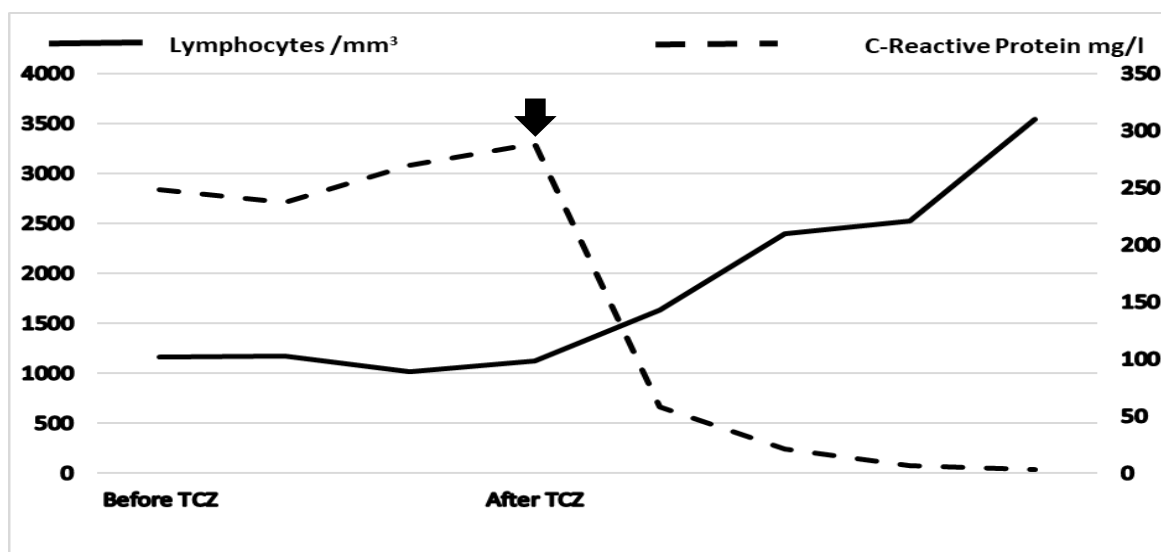


Figure 1: Evolution of lymphocytes and C-reactive protein in Case 1 successfully treated by Tocilizumab (Black arrow indicates the day of administration of TCZ). TCZ, Tocilizumab. CRP, C-reactive protein.

Case report 2

Mr L.O, a 66-years-old male followed for type 2 diabetes, was admitted in ICU with severe COVID-19 pneumonia confirmed by RT-PCR analysis. Chest CT showed GGO involving more than 75% of lung parenchyma. The patient was intubated and ventilated and treated by Lopinavir/Ritonavir without improvement. Thus, a single dose of 400 mg of TCZ was administrated. Unfortunately, death occurred with multiple organ dysfunction syndromes.

Case report 3

Mr D.M, a 76-years-old male with chronic disease (hyperthyroidism and hypertension), was admitted to ICU for severe SARS-CoV-2 pneumonia. Chest CT showed GGO involving 25-50% of lung parenchyma. Non-invasive ventilation was first used with intravenous ceftriaxon and moxifloxacin. On day 5, clinical status worsened and the patient was ventilated invasively. A single 400 mg dose of TCZ was administrated. On day 10, the patient died due to multiple organ dysfunction syndromes.

Comment

Theoretically, TCZ is an effective therapeutic option of the SCRS in severe COVID-19 patients [2]. But clinically, its efficacy still debated. On one hand, on day 28, Campochiaro et al. showed no clinical improvement and mortality in 32 patients treated with TCZ compared to 33 patients who received standard treatment [3]. On another hand, Capra et al. and Toniati et al. observed a favourable clinical outcome and survival improvement, in 62 and 100 patients, respectively [4,5]. Finally, a systematic review concluded that the ongoing phase III trials will be important to specify the place of TCZ [6].

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