COVID-19 in a patient with systemic sclerosis treated with tocilizumab for SSc-ILD

During the current global outbreak of coronavirus disease 2019 (COVID-19), risk stratification of patients is of utmost importance. Currently, patients >65 years and those with pre-existing medical conditions such as cardiovascular disease, chronic respiratory disease or diabetes mellitus are considered at higher risk for severe disease.[1] The Swiss Federal Office of Public Health, like similar authorities around the world, has additionally included patients on immunosuppressants in the high-risk group for developing severe COVID-19.[2] However, at this moment we do not have enough evidence either to support or to reject this assumption.

We report the case of a 57-year-old woman with systemic sclerosis (SSc) who developed COVID-19. Comorbidities were insulin-dependent type 2 diabetes mellitus and WHO grade I obesity. The anti-topoisomerase I antibody-positive patient was diagnosed with SSc in 2017. SSc-associated interstitial lung disease (SSc-ILD), with cough and exertion dyspnoea, was the leading organ manifestation, associated with symmetrical, non-erosive polyarthritis, and elevated acute phase reactants. Treatment with the anti-interleukin (IL) 6 receptor blocker tocilizumab, with 8 mg/kg body weight every 4 weeks intravenously, was started, leading to a good control of both arthritis and SSc-ILD, with gradual improvement of musculoskeletal and respiratory symptoms, lung function and high-resolution CT imaging (figure 1). At the last annual assessment in January 2020, her forced vital capacity and carbon monoxide lung diffusion capacity were 92% and 70% of the respective predicted values. Tocilizumab was continued at 5-week intervals.

On 12 March 2020, 4 weeks after the last tocilizumab infusion, the patient presented to our hospital's emergency department with cough, headache and general malaise since about 1 week. She reported contact with a patient with COVID-19 2 weeks earlier. As she was in relatively good general health condition, subfebrile (37.6°C), with unchanged bibasal lung crackles and no significant dyspnoea, she was allowed to return home with symptomatic treatment only. The nasopharyngeal swab was positive for the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2) by real-time reverse transcription-PCR. She was quarantined at home and monitored by daily telephone calls, and the upcoming tocilizumab infusion was postponed. The symptoms remained mild, and, 10 days later, she reported to be free of symptoms. A follow-up nasopharyngeal swab for SARS-Cov2 performed on March 26 turned out negative. She was thus declared cured from the infection and scheduled to receive the next tocilizumab dose 4 days after the negative test.

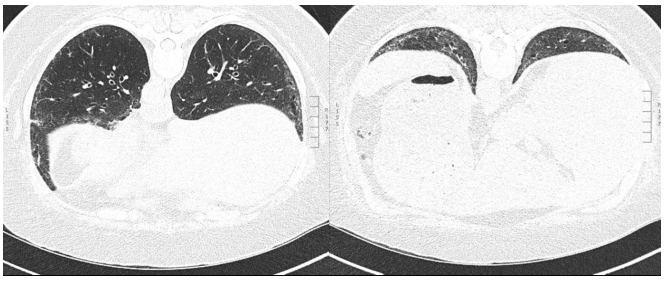

Figure 1 High-resolution CT (HRCT) of the chest, 8 weeks before onset of coronavirus disease 2019 (COVID-19). Ground glass and reticulation as signs of systemic sclerosis (SSc)-associated interstitial lung disease are visible, with an overall lung involvement of <20%.

In this case, a patient with insulin-dependent type 2 diabetes mellitus and SSc-ILD treated with tocilizumab developed a mild form of COVID-19. Her pre-existing ILD and diabetes are WHO-defined risk factors for a more severe course of COVID-19,[1] while immunosuppressive treatment is currently also regarded as a risk factor.[2] In previous coronavirus outbreaks however, immunosuppression was not a documented risk factor.[3] At present, in patients with COVID-19 from Wuhan, China, higher levels of C reactive protein and IL-6 have been associated with increased mortality.[4] Accumulating evidence suggests that a subgroup of patients with severe COVID-19 develop a cytokine storm syndrome.[4] Currently, several ongoing randomised trials study the efficacy and safety of anti-IL-6-receptor monoclonal antibodies in severe COVID-19.[5 6] Although these agents are immunosuppressive and thus formally contraindicated in patients with active infections, they may show benefit in certain subgroups of COVID-19-associated severe acute respiratory distress syndrome. In addition, our case indicates that IL-6-blocking treatment given for chronic autoimmune diseases such as rheumatoid arthritis or connective tissue disease may even prevent the development of severe COVID-19. While we are fully aware of the limitations of single-case observations, we think the presented case report supports this hypothesis. Thus, future prospective, controlled studies should include an analysis for the potential preventive effects of IL-6 blockade in COVID-19.

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