

## Rheumatologists and Pulmonologists at Temple University Weather the COVID-19 Storm Together

To the Editor:

In recent commentaries from *Lancet Rheumatology* and *The Journal of Rheumatology*<sup>1,2</sup>, the authors eloquently illustrated the connection between the coronavirus disease 2019 (COVID-19) infection, the subsequent cytokine storm (CS) that ensues in a number of patients, and the potential efficacy of biologics that rheumatologists routinely use in their practices. Moreover, those biologics were originally investigated by rheumatologists for the treatment of numerous rheumatic conditions, including macrophage activating syndrome (MAS), a similar form of storm that resembles the one occurring in patients with COVID-19<sup>3</sup>. The authors therefore conclude that rheumatologists could provide a helpful perspective in fighting the COVID-19 pandemic.

The Thoracic Medicine and Surgery (TMS) Department and the Rheumatology Division at Temple University Hospital (TUH), Philadelphia, USA, have been working together since the beginning of the pandemic, which reached the Philadelphia area around the second week of March. Both teams realized that the emerging approaches used to treat the hyperinflammatory response during the COVID-19 infection were used for years in rheumatic diseases and that rheumatologists had a direct experience with the treatment of CS such as MAS<sup>3</sup>. The pandemic had not yet reached Philadelphia but TUH had already transformed an entire 8-story building into a COVID-19 facility, especially for patients in need of an intensive care unit. These early arrangements gave enough time to organize an approach to recognize the CS syndrome early on so that treatments could have been delivered in a timely manner, and possibly more effectively.

We have worked together in designing the treatments for patients that would not otherwise qualify or refuse to participate in clinical trials. The rheumatology team, based on the literature on the CS syndromes and the early published reports from China, organized for the Temple Electronic Medical Record a list of laboratory tests suggestive of the impending CS. These laboratory tests are performed on a daily basis so that early signs of CS can be detected and therefore treated early. Finally, the Rheumatology Division set up a COVID-19 model for the consultation wherein multiple Fellows paired with faculty can provide recommendations on a timely basis and up to 3 times a day, especially in view of the rapid deterioration of patients with COVID-19<sup>4</sup>. This was initially an important step up for the Division, because at our peak we were admitting to TUH up to 40 patients a day.

The Emergency, the Radiology, and the TMS departments worked in tandem to diagnose patients early on through real-time PCR testing for COVID-19 and high-resolution computed tomography scanning to diagnose the typical diffuse ground-glass opacity that infected patients develop<sup>5</sup>. Patients are then followed by daily chest radiograph. The COVID-19 teams

that directly care for hospitalized patients monitor their status and laboratory markers. Rheumatology is consulted through telemedicine if respiratory status worsens and abnormalities of the daily inflammatory laboratory markers are detected. Rheumatology and TMS have implemented together a number of therapeutic approaches outside of several clinical trials that TUH is part of. This collaboration has led to the treatment of several hundred patients with CS. Remarkably, almost as many were enrolled in clinical trials where in some cases, faculty from the TMS Department and Rheumatology Division share the role of principal investigators. We have so far discharged home more than 92% of the 1000-plus patients admitted.

The inclusive and collegial approach to the COVID-19 pandemic of the TMS department has allowed the Rheumatology Division to be fully part of the care of COVID-19-induced CS, with significant gain in experience for both groups; hence at TUH the advice from rheumatologists has been fully embraced.

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First Release July 1 2020; *J Rheumatol* 2020;47:xxxxxx;  
doi:10.3899/jrheum.200740