Arthritis drug presents promise as treatment for COVID-19 pneumonia

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Tocilizumab, marketed as Actemra, is approved for treatment of rheumatoid arthritis. It is being assessed as a potential treatment for COVID-19-related pneumonia. Credit: Roche

UC San Diego Health has launched a Phase III clinical trial, part of a global effort, to assess whether a medication used to treat rheumatoid

arthritis and other inflammatory disorders might also have therapeutic value for COVID-19 patients who have developed or at high risk of developing serious lung damage from SARS-CoV-2 infections.

Tocilizumab, marketed as Actemra, is an immunosuppressive drug used primarily to treat rheumatoid arthritis and systemic juvenile idiopathic arthritis, a severe form of the disease in children. The monoclonal antibody-based therapy works by blocking cellular receptors for interleukin-6 (IL-6), a small protein or cytokine that plays an important role in triggering inflammation as an early immune response to disease.

In some patients with COVID-19, however, the immune response runs amok, overexpressing IL-6 and generating a "cytokine storm," which can lead to potentially life-threatening damage to lungs and other organs. Cytokine storms have been linked to a number of inflammatory diseases, from respiratory conditions caused by coronaviruses such as SARS and MERS to some forms of influenza to non-infectious diseases such as multiple sclerosis and pancreatitis.

Previous research has suggested elevated levels of IL-6 are associated with higher mortality in people with community-acquired pneumonia. In the early days of the novel coronavirus outbreak in Wuhan last year, Chinese physicians used tocilizumab to treat a small number of COVID-19 patients with serious lung damage, and reported promising results. The Chinese National Health commission now includes tocilizumab in its guidelines for treating COVID-19-related pneumonia and other lung issues.

"There are no approved therapies for COVID-19, beyond symptomatic treatment," said Atul Malhotra, MD, research chief of pulmonary, critical care and sleep medicine at UC San Diego Health. "But there is increasing evidence that COVID-19 can dramatically impact patients in many different ways, not least by severely damaging inflamed lungs.

"The mechanism of tocilizumab suggests a way to dampen and halt that inflammatory response, which might reduce the need for more extreme medical interventions, such as mechanical ventilation, and greater risk of chronic injury and death."

The randomized, double-blind, placebo-controlled interventional trial will enroll approximately 330 participants at nearly 70 sites across the world. For its arm of the trial, UC San Diego will recruit up to 20 participants.

Participants must be 18 years or older and hospitalized with diagnosed COVID-19 pneumonia and evidence of impaired gas exchange. Participants will receive one intravenous infusion of either tocilizumab or the placebo, with a possible second infusion if clinical symptoms worsen or show improvement. Funding and resources for the trial are provided by the pharmaceutical company Genentech/Roche, which makes Actemra.

"The endpoints or questions we're seeking to answer are these: Does tocilizumab improve the health and clinical status of treated COVID-19 patients," said Malhotra. "Does it reduce the mortality rate due to COVID-19 pneumonia? Does it reduce the need for mechanical ventilation or need for patients to go into intensive care units?"

Estimated study completion date is September 30, 2020.

Provided by University of California - San Diego