

「Inflammatory markers can predict COVID-19 severity and survival」

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Mount Sinai scientists have identified two markers of inflammation that reliably predict the severity of COVID-19 cases and likelihood of survival, providing a foundation for a diagnostic platform and therapeutic targets, according to a study published in Nature Medicine in August. [1, 2]

The researchers studied four proteins known as cytokines that circulate in blood and are commonly associated with infections, and found that two of them, called IL-6 and TNF- α , were able to predict which patients were likely to develop more severe forms of COVID-19 and die. The results from the tests showed that the risk of death in patients with elevated IL-6 or TNF- α was twofold or higher, even when considering other known risk factors. They also found that treatments recently found to benefit COVID-19 patients, such as the antiviral remdesivir or the corticosteroid dexamethasone, could lower the levels of the cytokines. [2]

Based on these results, the researchers propose that these cytokines should be monitored in the treatment of COVID-19 patients to help select those who should enter clinical trials and receive specific drugs that can target them. Notably, when adjusting for disease severity, common laboratory inflammation markers, hypoxia and other vitals, demographics, and a range of comorbidities, IL-6 and TNF- α serum levels remained independent and significant predictors of disease severity and death.

Several previous studies have also revealed that the hyper-inflammatory response induced by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a major cause of disease severity and death. [3, 4] In May, researchers found that the elevated levels of CRP might be linked to the overproduction of inflammatory cytokines in severe patients with COVID-19. Cytokines fight against the microbes but when the immune system becomes hyperactive, it can damage lung tissue. Thus, CRP production is induced by inflammatory cytokines and by tissue destruction in patients with COVID-19. [3] The other statistical meta-analysis confirmed the association of inflammatory markers, especially CRP, PCT, IL-6 and ESR, with the severity of COVID-19. Measurement of inflammatory markers might assist clinicians to monitor and evaluate the severity and prognosis of COVID-19.

Taken together, inflammatory markers seem to very directly related to Covid-19. Monitoring the levels of these inflammatory markers before and during experimental treatments such as anti-cytokine antibodies or corticosteroids will be useful to establish a predictive and prognostic value for these potential biomarkers. Moreover, patients with high levels of inflammatory markers should be assessed for combinatorial blockade of pathogenic inflammation in this disease. Currently, these drugs blocking these

cytokines are either FDA-approved or in clinical trials.

Reference:

1. Kim Stewart. Aug 25, 2020. "Inflammatory Cytokine Markers Predict COVID Severity and Survival" *today's practitioner newsletter*.
2. Diane Marie Del Valle et al., Aug 24, 2020 "An inflammatory cytokine signature predicts COVID-19 severity and survival" *Nature Medicine*. DOI: 10.1038/s41591-020-1051-9
3. Nurshad Ali, May 30, 2020 "Elevated level of C-reactive protein may be an early marker to predict risk for severity of COVID 19" *J Med Virol*. DOI: 10.1002/jmv.26097
4. Furong Zeng et al., May 18, 2020 "Association of inflammatory markers with the severity of COVID-19: A meta-analysis"

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