

Strong T-cell response could prevent severe Covid-19: Study

Scientists here have found that a strong T-cell immune response specific to the Sars-CoV-2 virus, observed in some people, could prevent severe Covid-19.

The immune system depends on the T-cells, a type of white blood cells, working together with antibodies to eradicate the virus.

The study, by Duke-NUS Medical School and the National University of Singapore's Saw Swee Hock School of Public Health, compared the T-cell response of 85 asymptomatic patients and 75 who were symptomatic. The patients were infected with the virus at around the same time.

The findings were published online in the *Journal of Experimental Medicine* on March 1.

The asymptomatic patients were selected from migrant workers staying in dormitories, and the rest from Covid-19 patients with mild to severe symptoms at the Singapore General Hospital, National University Hospital and National Centre for Infectious Diseases.

The team found that the frequency with which the T-cells recognised different viral proteins produced by the Sars-CoV-2 virus was similar in both asymptomatic and hospitalised patients. But those who were asymptomatic produced higher quantities of IFN gamma and IL-2, which are cytokines produced by T-cells when an infected cell is recognised. The cytokines play an important role in inhibiting viral replication.

Dr Nina Le Bert, senior research fellow at Duke-NUS' Emerging Infectious Diseases (EID) programme and co-author of the study, said the findings could be key in explaining why some patients were able to recover from their infections faster and without developing any symptoms.

She added that all the recovered patients whom they tested had developed both antibodies and T-cells, although some had undetectable levels of antibodies but a high level of T-cells.

Much is still unknown about the level of T-cells necessary to protect an individual from Covid-19.

An earlier study, also by Duke-NUS, closely tracked the amount of Sars-CoV-2 specific T-cells in 12 Covid-19 patients throughout their illness, and found that those who had T-cell responses early on in their infection were less likely to develop severe disease.

The 12 patients in Singapore had varying disease severity. Some had mild or moderate symptoms, while others were severely ill or eventually succumbed to the disease.

The study, which was published in the scientific journal *Cell Reports* in January, found that those with severe disease had few functional T-cells specific to the virus, and they emerged many days after the disease onset. Those with mild disease, however, had a larger number of T-cells as early as two days after disease onset.

Dr Anthony Tanoto Tan, senior research fellow at the Duke-NUS EID programme, and co-author of the study, said that monitoring the patient's level of T-cells can help doctors determine if the disease is likely to be mild or severe. Patients with a weak or delayed T-cell response may need to be closely monitored in intensive care.

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