

## Covid-19-New test to quickly identify infection and severity. Details here

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The first, second and now third wave of Covid-19 has made one thing very clear – the speed of getting the results of the coronavirus test plays an important role in its diagnosis and treatment.

Now, researchers from George Washington (GW) University have made a breakthrough discovery with developing a blood test that quickly detects if an individual has coronavirus and predicts how severely the immune system will react to the infection.

The finding, published in 'PLOS One', could one day lead to a powerful tool to help doctors determine the best treatment plan for people with coronavirus.

At present, there is no good way to predict how the immune system will respond to coronavirus that causes the infection or other disease-causing microbes.

The immune response could range from mild symptoms, all the way to critically severe symptoms, which can lead to the intensive care unit or even death.

To understand more about the variation in symptoms and prognosis, the GW researchers sequenced whole blood RNA from Covid-19 patients whose symptoms ranged from asymptomatic to severe.

They found visible changes in the cells of people with COVID-19. Their analysis also revealed that COVID-19 severity was associated with an increase in neutrophil activity and a decrease in T-cell activity.

Neutrophils and T-cells, both a type of white blood cell, are part of the body's immune system and help fight off infections.

In other words, the body's immune system response, as measured by neutrophil activity, signals that there's an infection whether caused by a known, novel, or variant pathogen.

"This test could prove very valuable during the pandemic, especially as variants continue to spread and doctors need to be confident in identifying the problem and providing effective treatment," said Timothy McCaffrey, professor of medicine at GW and lead researcher on the project.

"When we sequence whole blood RNA, we're given a fuller, more dynamic picture of what's happening inside the body, and our test helps identify those who need the more aggressive treatments."

Previous research by McCaffrey and others identified RNA biomarkers for infection in patients with inflammatory conditions such as appendicitis and pneumonia.

Similar to their more recent findings with COVID patients, when they measured RNA levels in the patients' blood, they detected an increase in neutrophil-related RNAs.

When the pandemic hit, McCaffrey and his team pivoted and applied their approach to identifying RNA biomarkers for COVID-19 infection detection and severity.

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The point-of-care device they've developed and are testing would be able to detect infection from pathogens such as SARS-CoV-2, but would also have other useful applications, according to McCaffrey.

"Beyond the current pandemic, our technique would be able to detect any infection with a high degree of accuracy," he said. "That has applications for all sorts of conditions wherein doctors diagnosing patients need to quickly rule in or rule out whether they are dealing with an infection or something else.

If additional studies proved that the test is effective, the researchers planned to seek an emergency use authorization from the U.S. Food and Drug Administration.

Such authorization could take 6 months or longer, but if approved, the test would give clinicians a powerful tool in the fight against this and future pandemics, McCaffrey added.

Meanwhile, India has completed two years since the first coronavirus case was reported in the country and during this time, it has not just battled the virus but also its mutated variants, even as uncertainty continues to surround the expected course of the pandemic.

Since then, India has battled three waves of COVID-19 and its seven mutated variants, many of which turned out to be lethal.

Till now, India has reported 4,10,92,522 cases and 4,94,091 fatalities due to COVID-19 and its variants.

According to the Indian SARS-COV-2 Genomics Consortia INSACOG, there are seven variants of concern that have been identified in the last two years in India – Alpha, Beta, Gamma, Delta, B.1.617.1 and B.1.617.3, AY series and Omicron.

Of these, Delta and Omicron variants have been found to be the most dangerous with the former driving the second wave of COVID-19 while the latter is behind the ongoing third wave.

With agency inputs