

A healthcare assistant from Ren Ci @ Bukit Batok Street 52 getting the Pfizer-BioNTech vaccine in January. Researchers tracked the immune response of 20 healthcare workers here who took the vaccine in January, and found that 16 developed antibodies against the spike protein of the virus after 12 days. ST PHOTO: GAVIN FOO



# Pfizer vaccine can give early protection 12 days after one dose

Local researchers say it's due to early development of antibodies, immune cells targeting virus

Cheryl Tan

Researchers here have found that the Pfizer-BioNTech vaccine can help the body produce specific antibodies and immune cells against the Sars-CoV-2 virus.

That may explain why it is able to offer protection from Covid-19 as early as 12 days after a single dose.

According to an Israeli study conducted among healthcare workers, the first dose of the Pfizer-BioNTech vaccine was found to be 85 per cent effective against Covid-19.

Canadian researchers had also suggested delaying the second dose of the vaccine, following research suggesting an efficacy of 92.6 per cent after the first dose.

The clinical data from the international Pfizer-BioNTech trial, conducted among 44,000 participants, also revealed that the number of Covid-19 cases among the vaccinated group tapered off 10 to 12 days after the first dose, whereas the cases continued to increase among the placebo group which did not receive the vaccine.

The vaccine, with a known effi-



The Pfizer-BioNTech vaccine, with a known efficacy rate of 95 per cent, requires two doses three weeks apart. PHOTO: BLOOMBERG

cacy rate of 95 per cent, requires two doses three weeks apart.

Taking these findings a step further, a team of researchers from the Singapore General Hospital (SGH) and the Duke-NUS Medical School found this protection was a result of the early development of antibodies and a type of immune cells known as T-cells, which specifically target the Sars-CoV-2 virus.

Duke-NUS' professor of emerging infectious diseases Ooi Eng Eong, who is also the corresponding author of the study, said this could help researchers assess vaccines and monitor the length of immunity against Covid-19.

To test the effectiveness of a Covid-19 vaccine, scientists typically look out for a specific type of antibodies known as neutralising

antibodies, which bind to the Sars-CoV-2 virus and prevent it from infecting human cells.

However, Associate Professor Jenny Low, senior consultant with the department of infectious diseases at SGH, said studies done for both the Pfizer-BioNTech and Moderna vaccines had shown there were no detectable levels of neutralising antibodies 12 days after the first dose of the vaccine, although protection was already conferred.

"So it must be something else in the body, whether it's T-cells or some other non-neutralising antibody that is conferring the protection.

"That was what we wanted to find out," said Dr Low, a senior author of the study.

The researchers tracked the im-

mune response of 20 healthcare workers here who took the Pfizer-BioNTech vaccine in January.

The study findings have been submitted to the scientific journal *Cell Press* and remains under review.

It found that all 20 individuals had developed T-cells which recognised the spike protein of the Sars-CoV-2 virus just 10 days after receiving their first vaccine dose.

The spike protein of the Sars-CoV-2 virus cell facilitates entry of the virus into human cells.

T-cells are important components of the immune system which carry out various functions, one of which is to detect and remove virus-infected cells to limit the spread of the virus.

In addition, 16 of the vaccinated individuals, or 80 per cent, developed antibodies against the spike protein of the virus after 12 days.

But only four, or 20 per cent, produced neutralising antibodies after 12 days, even though these antibodies have been widely assumed to be essential for protection against Covid-19, noted Prof Ooi.

He said: "Although the durability of protection that comes with a single dose is currently unknown, the protection... at this 12-day mark offers us an opportunity to understand the body's immune response that is required for protection against Covid-19."

tansuwen@sph.com.sg