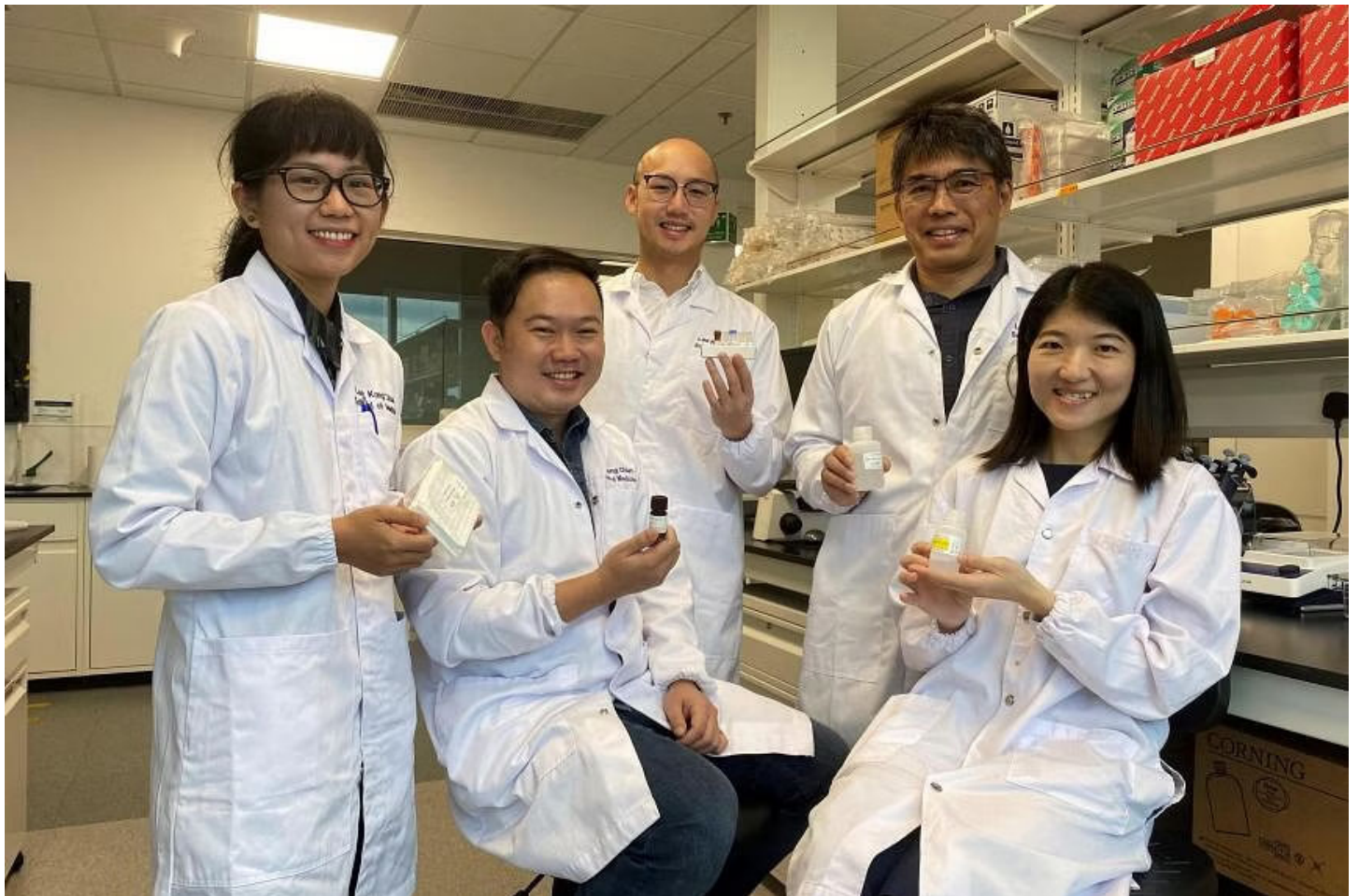


THE STRAITS TIMES

Heart-failure kit to be adapted to identify severe dengue cases



A team from NTU discovered two compounds in blood that could identify patients at risk of severe dengue. PHOTO: NTU



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SINGAPORE – A team of doctors and researchers is looking to adapt a test kit for heart failure to help doctors single out which dengue patients are at risk of severe dengue during the early stages of the disease.

The kits, which are commercially available, can be modified to take advantage of a recent finding by a team from Nanyang Technological University (NTU) and the National Centre for Infectious Diseases (NCID), who identified two compounds in the blood of dengue patients that could determine if a patient is at risk of severe dengue.

Called sST2 and suPAR, the compounds are also present in heart failure patients, causing inflammation and fluid overload in the body.

“What we found was that these two proteins can be identified early in dengue infection, and they are actually quite useful in identifying patients who may progress to experience severe dengue,” said Dr Andrew Teo, lead author of the study and a dean’s postdoctoral fellow at NTU’s Lee Kong Chian School of Medicine.

During a dengue infection, the body’s immune response is triggered, elevating the levels of the two compounds. The team found that most severe dengue cases tended to have higher levels than non-severe cases.

Dr Chia Po Ying, a consultant at NCID who led the clinical recruitment for the study, said: “Heart failure is a complication of severe dengue. So when we were looking at these components, we found that even in early dengue infection, these two proteins were higher than usual. That was why we pivoted to look at this in terms of potential biomarkers for dengue.”

The findings from the study were published in peer-reviewed scientific publications *Journal Of Infection and Clinical Infectious Diseases* in October.

Dengue, which is endemic in Singapore, is a mild disease, but three in 20 infected people (15 per cent) progress to severe dengue, which is life-threatening.

Dr Teo said the current methods of testing for dengue infection are inconsistent and take longer to predict the progress of the disease in patients.

He said the current standard practice is to send blood tests of suspected dengue patients to a central laboratory, and it takes some 24 hours for the results to be ready.

Dr Chia noted that this is not efficient, as the warning signs of dengue infection for the majority of patients occur one day before or on the day itself.

Citing the outbreaks in 2020 and 2022, she said the current recommendation to monitor dengue infected patients daily, which requires the patients to take blood tests every day until they recover, “can be quite a significant burden on our healthcare system”.

Describing the heart failure test kit as similar to the antigen rapid test (ART) kit, Associate Professor Yeo Tsin Wen, an infectious diseases specialist at the Lee Kong Chian School of Medicine, said: “The test would be easy, and an inexpensive point-of-care tool to help doctors avoid unnecessary hospitalisation of patients suffering from mild dengue, relieving the healthcare burden and costs during dengue outbreaks.

“It would also improve the management of dengue cases, as it would help prioritise resources to treat severe cases.”

However, unlike ART kits, a small machine is needed to confirm the two compounds, so the kit is a useful tool for general practitioner clinics and polyclinics to have and not for home testing, Prof Yeo said.

Dr Teo added: “The turnaround time for the kit is between 10 and 15 minutes, and this is actually quite a game changer.”

Said Dr Chia: “If we can validate this discovery, we will be able to diagnose better who will develop severe disease (and) who will have a relatively straightforward disease early in the febrile phase. This, in turn, can actually result in an overall decrease in doctor visits required for dengue patients.”

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More than 32,000 dengue cases were reported in 2022 – the second-highest number, after a record of more than 35,000 cases were reported in 2020.

According to the National Environment Agency, 183 dengue cases were reported in the week ended Dec 9, with the current cumulative number of cases for the year at 9,229.

Prof Yeo said that with dengue being endemic not only in Singapore but also in the region, there are plans to work with regional collaborators to use the test.

“It could have implications for dengue management, not just in Singapore itself but also in South-east Asia,” he said.

Dr Chia said the team would need time to validate the current heart failure kit’s efficacy for testing dengue and it would be some five years before the kit is ready.

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