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A shot in the arm for HFMD vaccine research

5-year NUS study has found how virus, which has infected some 3,420 this year, infects cells

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Scientists here have cleared an important first step towards developing a vaccine against hand, foot and mouth disease (HFMD), which has already bedevilled some 3,420 people this year.

A study has found the most comprehensive data on how the most virulent of the group of minuscule viruses – enterovirus 71 – infects human cells, paving the way for the development of a protective vaccine.

"We have information that helps us understand how the virus replicates within the cells and the genetic materials required for it to do so," said Associate Professor Justin Chu from the National University of Singapore's (NUS) Yong Loo Lin School of Medicine, who led the study and is from the department of microbiology and immunology.

Prof Chu said the discovery allows scientists to search for drugs that target certain genes and block the pathways for the virus, which often leaves ulcers on the hands, feet and mouth. Understanding how the immune system works against the virus provides crucial information in developing a vaccine, he added.

From the start of the year until Feb 11, 3,421 people have contracted HFMD. Last year, 42,154 had HFMD, the Ministry of Health's Weekly Infectious Diseases Bulletin showed.

Currently, doctors can do little but treat its symptoms – which include a fever. Numbing gels are prescribed for ulcers. There is a vaccine but it is available only in China.

The team, comprising researchers from NUS and the Agency for Science, Technology and Research, spent five years on the project, in which 22,000 human genes – almost the entire human genome – were analysed. They found 342 genes necessary for the virus to replicate, and 103 which enhanced the virus. The team found that the genes also aided the replication of the Coxsackie A – the other virus that commonly causes HFMD here.

The findings were published in the prestigious international scientific journal Nature Communications last October.

The team is now studying if existing drugs used to treat flu symptoms can be repurposed to treat HFMD. It is also taking a more thorough look at a handful of genes that are identified as the most critical behind an HFMD infection.

There is also an ongoing effort to come up with a vaccine that can protect against enterovirus 71 and Coxsackie A. Preliminary studies on mice have shown it to be effective.

It is believed to be the third HFMD vaccine to undergo development here.

Dr Chan Poh Chong, head of the division of general ambulatory paediatrics and adolescent medicine at the National University Hospital, said the studies raise the possibility of finding ways to produce anti-viral drugs to reduce the severity and duration of the illness. Developing a new drug could take many years but repurposing an existing one dramatically cuts that waiting time.

While HFMD is relatively harmless, the ulcers in the mouth and lesions on the limbs can be extremely distressful, said Dr Chan who was not involved in the research.

Mrs Agine Ng, 35, can attest to that. Five years ago, she contracted HFMD after her son and daughter, who were then aged two and four, got it. Their ordeal lasted a month.

The administration executive stayed in her room for a week, in fear of passing the virus to her children who had recovered.

In that year, her son contracted the virus six times. She said: "I wish there was a vaccine then. It was painful to watch my kids suffer. They could not even open their mouths."

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