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Researchers identify 6 proteins that could help det H1N1 virus



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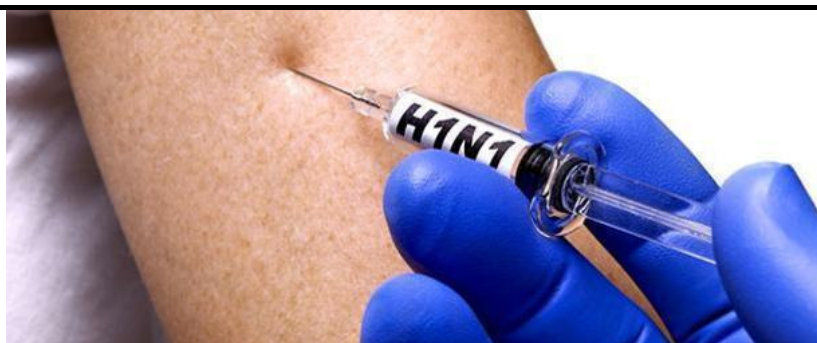
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Mumbai researchers have identified six proteins in the nasal swab that could help detect H1N1 virus - or swine flu infection - that played havoc across India during the 2009 pandemic. The preliminary results of a study.

The study could lead to diagnostic techniques that can detect the disease at an early stage. Currently, swab samples of suspected swine flu or high-risk patients hospitalised with symptoms of breathlessness and co-morbidity are put through a Real Time RT-PCR diagnostic test. However, the test needs special infrastructure and sophisticated instruments, making it difficult for hospitals or small pathological laboratories to conduct the tests.

The samples are therefore sent to specialised laboratories, which are practically non-existent in smaller towns.

Now, scientists and doctors from Mumbai want to change the way swine flu is detected - identification through a non-invasive diagnostic tool.

The preliminary findings assume significance since swine flu outbreaks post monsoon continue in India, resulting in morbidity and mortality. In 2015, the H1N1 infection killed more than 1,700 Indians. In Maharashtra, the figure was 905, 35% higher than 2011 when the virus was at its peak. Mumbai recorded 70 H1N1 deaths last year.

"We used nasal and throat swab samples of patients suffering from Acute Respiratory Illness (ARI). These swabs will contain a soup of proteins," said Professor Avinash Kale, University of Mumbai-Department of Atomic Energy Centre for Excellence in Basic Sciences (UM-DAE)

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"We took these nasal swabs, processed them, and isolated the proteins to identify biomarkers that are unique to swine flu and may therefore be used as diagnostic targets."

Protein biomarkers indicate the physiological state as well as changes in the patient during various stages of the disease, in addition to identifying specific virus infection at an early stage. Researchers said a big problem with swine flu is that it becomes endemic quickly. Since influenza (pH1N1) spread across the globe after being first discovered in humans in Mexico in 2009 and was known as a pandemic, it now spreads quickly from person to person through the air. Senior citizens, pregnant women, children, and those with compromised immunity are most susceptible to swine flu.

"Swine flu has symptoms fairly common with bacterial infections such as sore throat and breathlessness. As a result, patients with H1N1 get treated with antibiotics that are not effective against viral infections," said Kale. "There's also a need for urgent diagnosis since the disease can spread quickly." TOP

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How was the study carried out?

The six-member team used 200 nasal and throat swab samples that were confirmed for swine flu during the 2009 pandemic using the RT-PCR method. Ten nasal swabs were collected from healthy people and were used as controls. Proteins from the swabs were then isolated and separated into two dimensions - pH (acidity) and size - through a method called 2-D gel electrophoresis. Researchers compared the gels of those infected with those of healthy people. Different proteins were then picked up and put through an instrument called a mass spectrometer. Following this, the team identified potential protein biomarkers for the detection of swine flu.

"The results are preliminary, but encouraging," said Professor Abhay Chowdhary, head, department of microbiology, Grant Government Medical College and Sir J. J. Group of Hospitals. "No one can get rid of influenza since it's a tricky virus. But if we can detect specific proteins which are related to (swine) influenza, respiratory or bacterial infections through non-invasive methods that will help in early diagnosis before the disease flares up, patients can avoid excess use of antibiotics."

The next step, said researchers, is to repeat the studies for two consecutive H1N1 seasons to narrow down one or two protein markers that will help them design user-friendly diagnostic tests. "These can be made available to the health centres in remote locations," said Kale.

He added that this is the first report on respiratory proteome (entire set of proteins in an organism) profile in influenza patients.

The six-member team

The team comprises Professor Abhay Chowdhary, Grant Government Medical College and Sir J. J. Group of Hospitals, Professor Avinash Kale, Rahul Chavan, Dominic Colvin from University of Mumbai-Department of Atomic Energy (UM-DAE) Centre for Excellence in Basic Sciences, Sandeepan Mukherjee and Dr. Ritwik Dahake from the Haffkine Institute.

The preliminary results of their study were published in the journal *Virus Disease*.

Dailyhunt