SARS-like virus seems to cause deep lung infection

3 April 2013, by Kerry Sheridan

A new and deadly virus that has killed 11 of the 17 patients treated for it in the Middle East and Britain appears to cause an infection deep in the lungs, researchers said Wednesday.

Six research monkeys infected with novel human coronavirus were found to quickly develop pneumonia, according to a letter by National Institutes of Health experts in the *New England Journal of Medicine*.

After being exposed to samples of the virus, the rhesus macaques fell ill within 24 hours, with symptoms including elevated temperature, lack of appetite, coughing and fast breathing.

The macaques' illnesses appeared to last a few days before clinical symptoms went away. After euthanizing the monkeys, scientists found bright red lesions and darker purple areas of pulmonary inflammation in their lungs.

"We actually see that it replicates deep down in the lungs of the monkeys, which potentially could explain the disease in humans better," researcher Vincent Munster of the NIH/National Institutes of Allergy and Infectious Disease Rocky Mountain Laboratories in Montana told AFP in a phone interview.

"This kind of explains why this virus potentially could be fatal. If it replicates deep down in the lungs, eventually it could destroy the lungs' ability to take up oxygen and eventually cause severe disease," Munster added.

Kidney failure has been seen in people who have died of the disease, which was first detected last year.

The animal research is a "first step toward getting to know what the virus does in humans" and should help experts narrow down vaccine strategies and antiviral options for intervention, he told AFP.

The letter to the New England Journal of Medicine is the first to describe animal research on the virus. Previous attempts to study it in hamsters were of little use, Munster said.

But many questions remain about the virus, which seems to resemble Severe Acute Respiratory Syndrome (SARS)—which erupted in Southeast Asia a decade ago—and bird flu in the way it affects the lungs.

It is formally called hCoV-EMC/2012, which stands for human coronavirus-Erasmus Medical Centre, after the Dutch health institution that identified it.

The virus sample provided to researchers at the Rocky Mountain lab by Erasmus for the monkey research did not appear to cause the severe type of disease that has been seen in humans, Munster said.

That could indicate that there are more mild cases in circulation among humans, or it could reflect a difference in the way primates and humans react to the infection.

Current research has been limited to studying cases in people who have been hospitalized with severe illness.

The World Health Organization reported in late March that a 73-year-old man from the United Arab Emirates had become the 11th fatality from novel coronavirus. The WHO has documented a total of 17 cases globally.

Also last month, scientists reported in Nature magazine that the virus appears to infect the body via a docking point in lung cells, and suggested bats may be a natural reservoir for it.

Researchers believe the virus can be transmitted

from human to human, though such occurrences appear to be uncommon.

It remains unknown whether the disease is truly rare and acute, or if it may be more abundant but mild so as to escape detection most of the time.

More information: Munster et al. Novel Human Coronavirus Causes Pneumonia in a Macaque Model Resembling Human Disease. *New England Journal of Medicine* DOI: 10.1056/NEJMc1215691 (2013).