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NEWS

Camels could be the source of MERS coronavirus, research finds

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Camels could be a reservoir of a respiratory virus that has been circulating in the Middle East and has been implicated in 46 deaths, an international team of researchers has found.[1]

Middle East respiratory syndrome coronavirus (MERS-CoV) was first detected last year. Previous research has shown that the virus can replicate in cell lines from bats (believed to be the source of the SARS coronavirus outbreak in 2002-03), but bats are thought unlikely to be the source of the MERS outbreak. And since human to human transmission of MERS appears rare, public health researchers have been looking for an alternative animal reservoir.

Chantal Reusken, of the National Institute for Public Health and the Environment in the Netherlands, and colleagues, said that dromedary camels may be the culprits. They found antibodies to MERS at high levels in 50 camels from Oman and, surprisingly, low levels of antibodies in 15 out of 105 camels from the Canary Islands. Neither area has suffered any cases of MERS, so the team needs to test more widely, including in Saudi Arabia where most cases of human infection have occurred.

The evidence is strongly suggestive but not definitive. To prove the connection absolutely, Paul Kellam, from the Wellcome Trust Sanger Institute in Cambridge, told the BBC that it would be necessary to isolate the virus from an infected animal or to be able to sequence and characterise the genome from an infected animal.

Benjamin Neuman, of the Microbiology Research Group at the University of Reading, said, "This looks like the big break that public health workers needed in the fight against the spread of MERS. It comes at a serendipitous time, with the annual pilgrimage to Mecca to begin in a couple of months.

"The biggest mysteries of the MERS coronavirus outbreak have been how people are becoming infected with a virus of bats, and why it is happening in the Middle East. By showing that one-humped camels have a history of MERS-like infections, these scientists may have helped answer both questions at once.

"The antibodies tell us that the camels from the Middle East probably caught a MERS-like coronavirus, but they do not say when it happened or whether it was exactly the same as the virus that has spread to people. There was some anecdotal evidence of people who came down with MERS after contact with sick camels, but this is the first hard evidence that camels may be a missing link in the chain of transmission."

Reporting in the *Lancet Infectious Diseases,* the team said that it looked for MERS antibodies in a range of animals from different parts of the world, including camels, goats, alpacas, cattle, and sheep. Dromedary camels were the only species to test positive. All 50 samples taken from retired racing camels in Oman showed strong responses. Weaker responses were found in a minority of camels from the Canaries, a population that has not been in contact with Middle Eastern camels for many years because of fears of the transmission of foot and mouth disease. It is possible, the authors said, that there had once been an outbreak in this population but by the time of sampling antibody titres had waned and no new introductions of the virus had occurred.

The 100% positive testing in Oman points to a different situation there, with widespread circulation of MERS or a closely related virus, the researchers said. Targeted studies were now needed to confirm the finding, together with gathering detailed case histories of humans so far infected to investigate their contact with animals and animal products.

So far MERS infection has been confirmed in 94 people, 46 of whom have died. In the absence of preventive or therapeutic treatments, identifying the animal hosts and blocking transmission appears to be the best option, a commentary in *Lancet Infectious Diseases* said.[2]

1 Reusken CBEM, Haagmans BL, Müller MA, Gutierrez C, Godeke G, Meyer B, et al. Middle East respiratory syndrome coronavirus neutralising serum antibodies in dromedary camels: a comparative serological study. *Lancet Infectious Diseases* 9 Aug 2013, doi:10.1016/S1473-3099(13)70164-6.

2 De Wit E, Munster VJ. MERS-CoV: the intermediate host identified? *Lancet Infectious Diseases* 9 Aug 2013, doi:10.1016/S1473-3099(13)70193-2.

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