

MERS coronavirus can be transmitted from camel to man

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The MERS coronavirus is transmitted not only between animals but also from camels to humans. Credit: Norbert Nowotny / Vetmeduni Vienna

The MERS coronavirus is currently spreading very rapidly in the Arab world. An infection could affect human beings as well as camels, and has already cost more than 100 human lives. Scientists at the University of Veterinary Medicine, Vienna show that the MERS coronaviruses in man and camels from a single region are almost identical. Their conclusions indicate transmission of the virus from animals to man, and were published in the *Journal Eurosurveillance*.

The so-called Middle East respiratory syndrome (MERS) coronavirus was first found in June 2012 in a patient from Saudi Arabia, who suffered from severe pneumonia. Since this time more than 300 persons have developed an infection, of whom about a third died. The fact that the Arabian camel is the origin of the infectious disease has been confirmed recently. The transmission pathways of the viruses, however, have not been clear until now.

Viruses in humans and camels from one region are identical

Virologists Norbert Nowotny and Jolanta Kolodziejek from the Institute of Virology are investigating the transmission pathways of the MERS coronavirus. They found that viruses from infected humans and Arabian camels from the same geographical region have nearly identical RNA sequences. "This indicates transmission between animals and man. The process is referred to as zoonosis. With this knowledge we can specifically react to the spread of the [virus](#). Vaccinations of camels are currently being discussed. We will thus be able to halt the spread of the virus," said Nowotny.

Virus RNA differs from region to region

The scientists investigated nasal and conjunctival swabs, taken from 76 camels in Oman. In five camels they found the MERS coronavirus and compared its RNA with those of MERS coronavirus from Qatar and Egypt. The analysis showed that the viruses differ from region to region. "This means that there is no specific 'camel MERS coronavirus strain', but that one virus infects both, camels and humans," says study coordinator Norbert Nowotny.

Transmission pathway through nose and eyes

Virus levels were surprisingly high in the nasal mucosa and conjunctiva of camels. Therefore the scientists presume that the transmission pathway from animals to humans most likely occurs through these contact sites, especially through [nasal discharge](#).

In man the virus causes severe pneumonia and renal failure while camels show no or very little symptoms (in some cases nasal discharge). So far all infections in humans have occurred in the Arabian Peninsula. However, some developed the disease after they returned to their native country,

of whom eleven were from Europe. MERS coronavirus is also transmitted from one [human](#) to another, for instance in families, in the community, or through contact between patients and medical staff.

MERS and SARS coronaviruses are relatives

MERS coronavirus is closely related to SARS coronavirus. SARS originated in China and claimed 800 lives worldwide in 2002 and 2003. "While the SARS coronavirus probably crossed the species barrier only once by passing from bats to humans, we may presume that the MERS coronavirus is being constantly transmitted from camels to humans," explains Nowotny.

The fact that MERS coronaviruses infect [camels](#) was shown by Nowotny and his colleagues in an [earlier study](#), in which the scientists detected antibodies against the virus in the animals. The current genetic analysis of MERS coronaviruses permits more exact conclusions.

More information: The paper "Middle East respiratory syndrome coronavirus (MERS-CoV) in dromedary camels, Oman, 2013" by Nowotny N. and Kolodziejek J. was published in the *Journal Eurosurveillance*. www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20781

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