Tropentag, September 17-19, 2014, Prague, Czech Republic

"Bridging the gap between increasing knowledge and decreasing resources"

Presence of Middle East Respiratory Syndrome (MERS) Coronavirus Antibodies in East African Dromedary Camels

Anne Liljander[1], Victor Max Corman[2], Benjamin Meyer[2], Mario Younan[3], Mohammed Yahya Said[1], Ilona Gluecks[4], Erik Lattwein[5], Berend-Jan Bosch[6], Jan Felix Drexler[2], Set Bornstein[7], Marcel A. Müller[2], Joerg Jores[1], Christian Drosten [2]

[1] *International Livestock Research Institute (ILRI), Kenya*
[2] *University of Bonn Medical Centre, Germany*
[3] *Vétérinaires sans Frontières Germany (VsF G), Kenya*
[4] *Vétérinaires sans Frontières Suisse, Kenya*
[5] *EUROIMMUN AG, Germany*
[6] *Utrecht University, Dept. of Infectious Diseases and Immunology, The Netherlands*
[7] *National Veterinary Institute, Sweden*

Abstract

In 2012, a deadly viral disease called Middle East Respiratory Syndrome (MERS) was reported in Saudi Arabia. Since then, at least 250 human infections including 93 deaths have been reported. Most of the people that have been confirmed to have an infection with MERS-CoV developed severe respiratory illness. MERS is caused by a coronavirus called MERS-CoV. The evolutionary origins of MERS-CoV belonging to the Betacoronavirus clade C were attributed to insectivorous bats. Dromedary camels are the source of MERS-CoV infections in humans and may thus constitute a zoonotic animal reservoir. Seventy five percent of the world population of the one humped dromedary camel lives in the Greater Horn of Africa from where the majority of camelids on the Arabian Peninsula is imported. The role of dromedaries, as the one of the most important livestock species for nutrition in arid and semi-arid areas of Eastern Africa is likely to increase since the predicted climate change is in favour of this resilient species. Pastoralist communities that keep camels live in very close proximity with their livestock, potentially facilitating zoonotic transmission between camels and humans. Here we show that camels sampled in different regions in Kenya between 1992–2013 harbour antibodies to MERS-CoV. High camel population density correlated significantly with elevated seropositivity and might be a factor predicting long-term virus maintenance. Additionally, we detected antibodies to MERS-CoV in dromedary samples from Somalia and Sudan dating back to 1983, which supports the finding that a MERS-CoV or a closely related virus has been circulating in African camel populations for more than 30 years.

Together with the molecular data from African bat viruses, an evolutionary origin of MERS-CoV in Africa is supported by our data.

Keywords: Antibodies, coronavirus, dromedary camel, MERS, seropositivity

Contact Address: Anne Liljander, International Livestock Research Institute (ILRI), Nairobi, Kenya, e-mail: a.liljander@cgiar.org