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LETTER TO THE EDITOR

WILEY

Failure to detect MERS-CoV RNA in urine of naturally infected dromedary camels

To The Editor:

Dromedaries (*Camelus dromedarius*) are reservoirs for zoonotic transmission of Middle East respiratory syndrome coronavirus (MERS-CoV), but even six years after its discovery, the transmission route(s) of MERS-CoV from dromedaries to humans has not been fully elucidated.

The World Health Organization recommends that groups at high risk for severe MERS should avoid contact with dromedary camels, consumption of raw camel milk or camel urine, as well as eating meat that has not been properly cooked (WHO, 2019). Although MERS-CoV RNA has been detected in dromedary camel nasal secretions, saliva, faeces and milk (Farag et al., 2015; Haagmans et al., 2015; Reusken et al., 2014), and in human urine samples (Corman et al., 2016), so far no evidence has been obtained for the presence of the virus in dromedary urine (Adney et al., 2014; Ali et al., 2017). However, it has been speculated that, amongst others, collection and consumption of urine from acutely infected camels might create circumstances for cross-species transmission event (Gossnere et al., 2016; MacKay, 2015). Dromedary camel urine plays an ancient traditional and religious role in daily life in the Middle East and North Africa region as well as in parts of Asia. Camel urine is believed to have therapeutic effects in the treatment of cancer, diabetes, certain infectious and cardiovascular diseases as well as in the treatment of hair and skin problems. Hence, fresh urine is consumed, used to wash body and hair, and is a component in ointments (Alkhamees, 2017; Gader, 2016) for example it has been described that Bedouins in the Middle East have a daily consumption of 100 ml camel urine while a study amongst 156 Saudi cancer patients showed that 15.7% drank camel urine (Abuelgasim, 2018; Al-Yousef et al., 2012).

Here, we investigated the presence of MERS-CoV RNA and specific antibodies in urine of camels that were offered for slaughter at the central slaughterhouse in Doha, Qatar in March 2014. Qatar has reported 19 MERS cases as of August 2018 (WHO, 2019). Camels at the Doha slaughterhouse were shown to have a high prevalence of MERS-CoV RNA shedding. A previous study showed that 59% of the camels had evidence for virus shedding in at least one type of swab at the time of slaughter (Farag, 2014). Urine from 23 camels, aged 4 months to 10 years (median 6 months), was collected aseptically post-slaughter from intact bladders using 20 ml syringes. The collected urine was stored at −80°C until RNA extraction as described before (Reusken, 2014). The urine was analysed for the presence of MERS-CoV using a screening RT-PCR targeting the UpE region and a confirmatory RT-PCR targeting the N-gene as described before (Farag, 2015). We interpreted the urine results in the context of the presence of MERS-CoV RNA and antibodies in each respectively same-time collected nasal swab and serum sample (data in Farag, 2015). In none of the 23 urine samples, MERS-CoV RNA could be detected while of the corresponding 23 nasal swabs 11 camels tested positive using both tests. The same urine samples were analysed for the presence of MERS-CoV-specific antibodies using micro-array technology (Reusken, Haagmans, et al., 2013; Reusken, Mou, et al., 2013). We found MERS-CoV specific antibodies in 16 of 23 urine samples while all camels showed such evidence for a (previous) MERS-CoV infection in serum. Based on the observed relative fluorescence, the overall reactivity of the antibodies in sera was higher than of those present in urine (Data not shown). The specificity of the antibodies detected in the serum samples was confirmed by virus neutralization (Reusken, Haagmans, et al., 2013).

Although 11 camels showed evidence for an acute MERS-CoV infection at the time of urine sampling and all camels showed evidence for a (past) infection based on the presence of antibodies in serum, we found no evidence for shedding of MERS-CoV RNA in urine. These results are in line with data obtained from another field study and experimentally infected dromedaries, indicating the absence of MERS-CoV in camel urine (Adney, 2014; Ali, 2017). It should be noted that failure to detect the virus in urine in the former field investigation (Ali, 2017), in contrast to our study, was not linked to dromedaries with MERS-CoV RNA in their nasal swab. Together the studies imply the absence of a role of camel urine in MERS-CoV transmission to humans. However, to establish unequivocally that urine does not play a role in zoonotic transmission of MERS-CoV a large cohort study may be needed including animals of different age groups and at different stages of infection with simultaneous and longitudinal sampling of urine, serum and swabs. In the absence of results of such a systematic study, prudence towards consumption of raw camel urine is still indicated.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

KEYWORDS: livestock, MERS-CoV, public health, transmission, zoonosis

Elmoubasher A. Farag[1,2]
Bart L. Haagmans[2]
Hamad Al-Romaihi[1]
Khaled Mohran[3,4]
Mohamed Haroun[3]
Ahmed M. El-Sayed[1]
Marion Koopmans[2]
Mohammed AlHajri[1]
Chantal B. E. M. Reusken[2,5]

[1]*Ministry of Public Health, Doha, Qatar*
[2]*Department of Viroscience, Erasmus University Medical Centre, Rotterdam, The Netherlands*
[3]*Department of Animal Resources, Ministry of Municipality and Environment, Doha, Qatar*
[4]*Biotechnology Department ARC, Animal Health Research Institute (AHRI), Dokki, Egypt*
[5]*Centre for Infectious Disease Control, National Institute for Public Health and the Environment, Bilthoven, The Netherlands*

Correspondence
M. M. AlHajri, Department of Preparedness, Emergency and Response, Ministry of Public Health, P.O. Box 42, Doha, Qatar.
Email: mhajri1@MOPH.GOV.QA

ORCID

Chantal B. E. M. Reusken https://orcid.org/0000-0003-4605-9174

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