

A case of long-term excretion and subclinical infection with MERS-Coronavirus in a health care worker

Manal Al-Gethamy¹, Victor M. Corman², Raheela Hussain³, Jaffar A. Al-Tawfiq⁵, Christian Drosten², Ziad A. Memish^{4,6,#}

¹Infectious Diseases & Infection Control, Department of Medicine, Alnoor Hospital, Ministry of Health, Makkah, Kingdom of Saudi Arabia

²Institute of Virology and German Centre for Infection Research (DZIF), University of Bonn Medical Centre, Bonn, Germany

³Jeddah Regional Laboratory and Blood Bank, Ministry of Health, Jeddah, Kingdom of Saudi Arabia

⁴Public Health Directorate, Ministry of Health, Riyadh, Kingdom of Saudi Arabia

⁵Johns Hopkins Aramco Healthcare, Dhahran, Kingdom of Saudi Arabia and Indiana University School of Medicine, Indianapolis, IN (USA)

⁶College of Medicine, Alfaisal University, Riyadh, Kingdom of Saudi Arabia

#Corresponding Author: Prof. Ziad A Memish, Ministry of Health, College of Medicine, Alfaisal University, Riyadh, Kingdom of Saudi Arabia, Zmemish@yahoo.com

Dear Editor: The Middle East Respiratory Syndrome Coronavirus (MERS-CoV) has caused outbreaks of severe respiratory infection in countries of the Arabian Peninsula since 2012. Whereas camels are known to carry the virus, many primary cases including index cases in hospital outbreaks had no contact with camels. Only 4.3% of a total 161 cases had camel contact in one report [1]. The size and duration of hospital outbreaks is surprising in view of the low rate of transmission in household contact situations [2]. Unrecognized transmission patterns might exist.

During the Jeddah outbreak, a 40 years-old female nurse attended a 24 year-old, MERS-CoV positive, symptomatic male patient for primary admission. The nurse wore a surgical mask and gloves but no other personal protective equipment during the admission procedures. Procedures performed on the patient included the insertion of a venous cannula but no intubation or aerosol generating procedures were required. At that time, the Saudi Ministry of Health guidelines called for active screening of contacts of confirmed MERS cases in accordance with World Health Organization guidelines [3-5]. As per these guidelines, the nurse was tested by RT-PCR 2 days after exposure because of her occupational contact history. Despite the absence of symptoms, with positive test outcome in two different RT-PCR assays (upE and ORF 1A, **Table 1**), she was isolated at home and visited daily by infection control staff for follow up from April 24th till June 12th 2014. RT-PCR tests were conducted at weekly intervals, with consistently positive results more than five weeks after the first sampling (**Table 1**). For confirmation, the first and last positive-testing samples were confirmed by an external laboratory at the University of Bonn/Germany. Positive tests using two different RT-PCR assays were confirmed. RT-PCR contamination was excluded by sequencing of ca. 2 kb of viral genomic RNA. Sequence comparison using SNP patterns as described previously [6] revealed the presence of a virus strain typical for the Jeddah outbreak (737:C; 17836:T; 23953:G; 28778:A). Virus concentrations over the course of home quarantine are shown in **Table 1**.

Our earlier study on transmission of MERS-CoV in household contacts revealed the possibility of MERS-CoV detection by RT-PCR in persons who are not symptomatic [2,7]. In a second report 30% of case contacts were found to have identifiable virus in upper respiratory specimens [8]. The present case demonstrates that some individuals may be able to shed virus over prolonged periods of time, and without obvious symptoms preventing social activity. This group of individuals may include health care workers who would be able to transmit the virus to patients with predisposing conditions with the consequence of apparent new infections. In addition to general measures to limit nosocomial spread via fomites, droplet transmission, or during aerosol generating procedures, health care workers should be monitored for viral carriage to avoid prolongation of nosocomial outbreaks. These asymptomatic and prolonged shedders of MERS-CoV may lead to the appearance of new infections without clear transmission chains in patients who had been in hospital for more than one incubation period.

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Table 1: Timing, symptoms and laboratory results in a case of prolonged subclinical infection with the MERS coronavirus

| Visit date | Symptoms | RT-PCR | Ct Value |
|-------------------|-----------------|---------------|-----------------|
| April 24 | None | Positive | 35 |
| April 29 | None | Positive | 35 |
| May 9 | None | Positive | 34 |
| May 21 | None | Positive | 32 |
| May 29 | None | Positive | 30 |
| May 30 | None | Positive | 32 |
| June 5 | None | Positive | 35 |
| June 12 | None | Negative | 0 |
| June 14 | None | Negative | 0 |