

### A Case of Long-term Excretion and Subclinical Infection With Middle East Respiratory Syndrome Coronavirus in a Healthcare Worker

TO THE EDITOR—The Middle East respiratory syndrome coronavirus (MERS-CoV) has caused outbreaks of severe respiratory infection in countries of the Arabian Peninsula since 2012. Although 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-year-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

**Table 1. Timing, Symptoms, and Laboratory Results in a Case of Prolonged Subclinical Infection With the Middle East Respiratory Syndrome Coronavirus**

| Visit Date    | Symptoms | RT-PCR   | Ct Value |
|---------------|----------|----------|----------|
| 24 April 2014 | None     | Positive | 35       |
| 29 April 2014 | None     | Positive | 35       |
| 9 May 2014    | None     | Positive | 34       |
| 21 May 2014   | None     | Positive | 32       |
| 29 May 2014   | None     | Positive | 30       |
| 30 May 2014   | None     | Positive | 32       |
| 5 June 2014   | None     | Positive | 35       |
| 12 June 2014  | None     | Negative | 0        |
| 14 June 2014  | None     | Negative | 0        |

Abbreviations: Ct, cycle threshold; RT-PCR, reverse transcription polymerase chain reaction.

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]. In accordance with these guidelines, the nurse was tested by reverse transcription polymerase chain reaction (RT-PCR) 2 days after exposure because of her occupational contact history. Despite the absence of symptoms, with positive test outcome in 2 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 12 April till 12 June 2014. RT-PCR tests were conducted at weekly intervals, with consistently positive results >5 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 2 different RT-PCR assays were confirmed. RT-PCR contamination was excluded by sequencing of approximately 2 kb of viral genomic RNA. Sequence comparison using single-nucleotide polymorphism 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 reflected as the inverse of Ct values 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 asymptomatic case contacts were found to have identifiable virus in upper respiratory specimens on day 12 compared to 76% of cases [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 healthcare 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, healthcare 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 >1 incubation period.

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