Environmental Contamination and Viral Shedding in MERS Patients

To the Editor—Middle East respiratory syndrome coronavirus (MERS-CoV) is a newly recognized virus that can cause acute, severe respiratory infection. Although sustained human-to-human transmission of MERS-CoV has not been reported in the community setting, secondary and tertiary human-to-human transmissions have been described in healthcare settings [1–3]. Indeed, a hospital outbreak with a large cluster of patients was the defining epidemiological characteristic in the recent outbreak of MERS-CoV in South Korea [4, 5]. Factors that contributed to the large hospital outbreaks included delay in diagnosis of the index case, overcrowding in emergency departments, movements of patients prior to diagnoses, and suboptimal infection prevention and control [6]. A recent study demonstrated that MERS-CoV could survive for longer than 48 hours at 20°C and 40% relative humidity, suggesting contact or fomite transmission might occur in healthcare settings [7].

Recently, Bin et al reported that MERS-CoV was detected by reverse transcription polymerase change reaction (RT-PCR) in specimens taken from the hospital environment [8]. They also reported that MERS-CoV was isolated from medical equipment as well as respiratory specimens. In Table 2 of their article, MERS-CoV was isolated from 3 patients (patients 2, 3, and 4), and the respiratory specimens yielding virus culture (+) were obtained at 22 days (patient 2), 22 days and 25 days (patient 3), and 18 days (patient 4) after symptom onset. In patient 3, MERS-CoV RT-PCR was negative on day 27, just 2 days after virus culture (+). These results are unusual, considering that viral load was $>10^7$ copies/mL in most respiratory samples that yielded virus isolates and virus isolation was unsuccessful in later stages of the infection [9].

In their study, Bin et al defined virus isolation as "positive for MERS-CoV by both RT-PCR and sequencing." However, detection of a viral gene by RT-PCR and sequencing does not necessarily mean isolation of virus because carryover of viral RNA and contamination may also yield a positive PCR result. In order to prove isolation of "viable" virus, further data, such as cytopathic effects in cell culture and electron microscopy of MERS-CoV–infected cells, is needed. Until these data are available, we should be careful to use the term "viable" or "isolate" of virus.

Note

Potential conflict of interest. Author certifies no potential conflicts of interest. The author has submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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