Open Forum Infectious Diseases

CORRESPONDENCE

Environmental Surface Contamination With Monkeypox Virus in the Ambulatory Setting in Toronto, Canada

To the Editor—While transmission of monkeypox virus (MPXV) primarily occurs through direct contact, fomite transmission via environmental surfaces has been suspected in healthcare-associated infections [1–4]. We assessed the presence of MPXV on environmental surfaces in outpatient clinics where adults with confirmed MPXV infection were evaluated.

We conducted environmental sampling based on a convenience sample of adults (age ≥18 years) with MPXV infection attending 1 of 3 hospital-based, outpatient clinics in Toronto, Ontario between July and August 2022, during their first visit and up to 3 visits per patient. Following each clinical encounter, specimens were collected from a surface with the highest exposure to patient skin (exam table cover; referred to as "patient-high-touch"), a surface touched by both patient and healthcare worker hands (chair arms, doorknob, computer table; referred to as "shared-hand-high-touch"), and a no-touch surface (top of the door jamb; referred to as "no-touch") before and after cleaning using hospital-grade disinfectant wipes (Cavi-Wipes, Metrex Corp, USA; Clorox Healthcare Bleach Disinfecting Wipes, CloroxPro, USA; Oxivir Wipes,

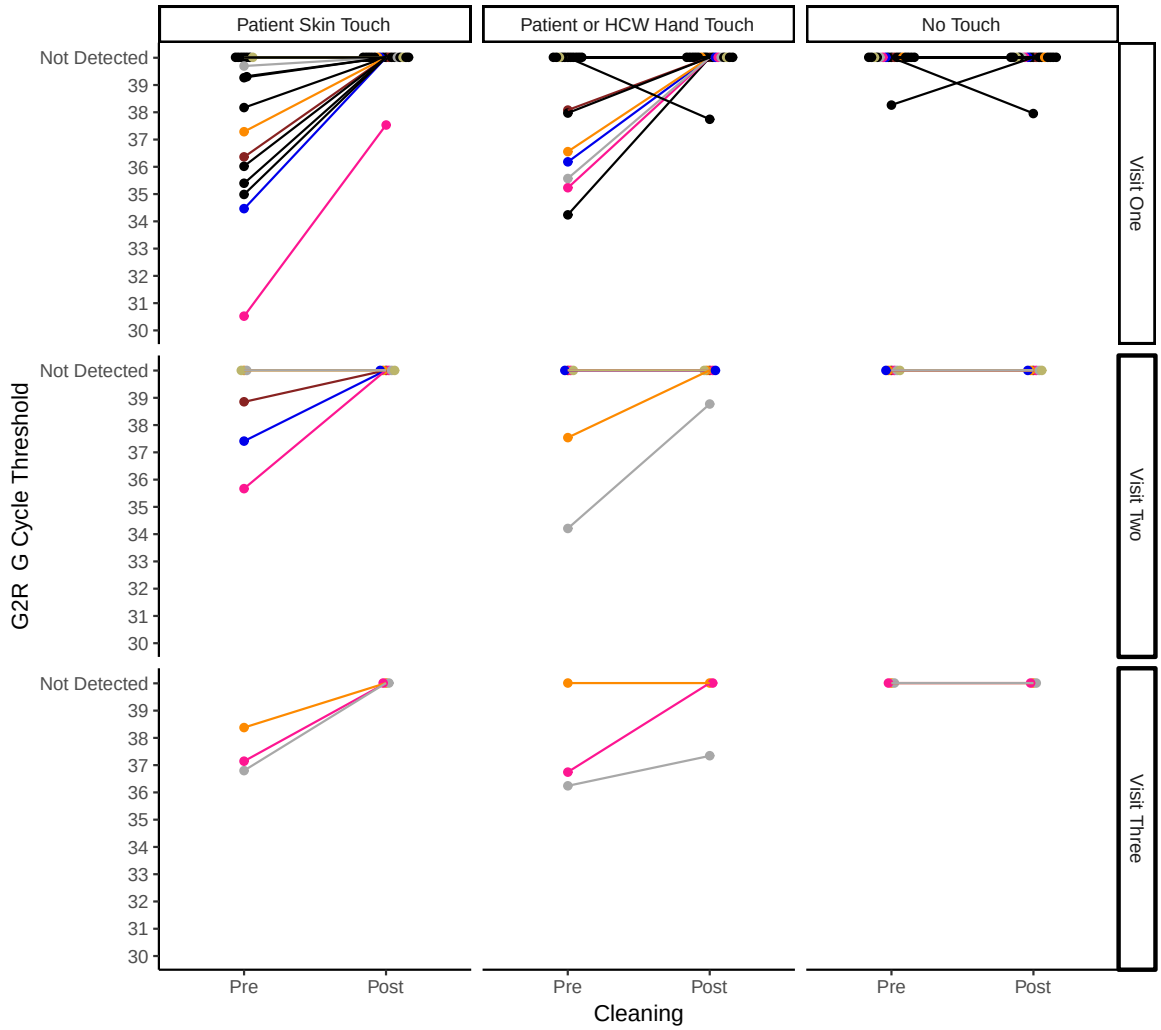

Figure 1. Cycle threshold (Ct) values for monkeypox virus (MPXV) G2R gene DNA before and after cleaning of patient-high-touch, patient and healthcare worker (HCW) shared-hand-high-touch, and no-touch environmental surfaces from outpatient clinics where individuals with monkeypox were assessed. Participants with 1 visit are represented by a black dot while those with >1 visit are represented by a unique color. The horizontal lines depict the Ct values for detectable (≤38), indeterminate (38.01–39.99), and undetectable (≥40) results.

Diversey, USA). A nylon swab (eSwab, COPAN), premoistened with universal transport media (UTM, COPAN), was used to swab a 100-cm^2 surface (or entire surface if smaller area) while rotating the swab continuously. Swabs were placed in an empty collection tube, stored at 4°C, and transported to the study laboratory within 24 hours, where 3 mL of UTM was added and the sample vortexed before aliquoting. All samples were tested for MPXV at the Public Health Ontario Laboratory as previously described [3]. A cycle threshold (Ct) value for the G2R gene of MPXV or a clade 3–specific region of G2R ≤38 was considered detectable, 38.01–39.99 indeterminate, and ≥40 undetectable. The proportion of detectable MPVX before and after cleaning was compared using a χ^2 test.

In total, 162 samples were collected after 27 clinic visits of 18 participants. All participants were cisgender men; median age was 38 years (range, 29–60 years) and median time from symptom onset to clinic visit with environmental sampling was 30 days (range, 8–66 days). The number of cutaneous lesions present on the day of environmental sampling was available for 20 of 27 (75%); 11 of 20 (55%) had 1–9 lesions, 5 of 20 (25%) had 10–24 lesions, and 4 of 20 (20%) had ≥25 lesions. Before cleaning, MPXV was detected in 26 of 81 (32%) environmental swabs from 18 of 27 (67%) visits representing 12 of 18 (67%) participants. Of these 26 positive swabs, 12 of 26 (46%) were patient-high-touch, 13 of 26 (50%) were shared-hand-high-touch, and 1 of 26 (4%) were on no-touch surfaces (Figure 1). After cleaning, 7 of 81 (9%) swabs had detectable MPXV, 23% fewer (95% confidence interval, 10%–37%; $P < .001$). These included 5 of 26 (19%) surfaces yielding MPXV DNA before cleaning and 2 of 55 (4%) from which MPXV DNA had been undetectable: 2 patient-high-touch, 4 shared-hand-high-touch, and 1 no-touch. In each surface that was positive before and after cleaning, Ct values were consistently higher after cleaning.

MPXV DNA was detected at low concentrations on high-touch surfaces from examination rooms after outpatient monkeypox visits. However, our findings suggest that commonly used hospital-grade cleaning wipes reduce environmental contamination, usually to undetectable levels. This level of disinfection may be adequate in most clinic settings, although more intensive cleaning may be required to consistently achieve undetectable levels. The long duration from symptom onset to environmental sampling among this cohort may underestimate environmental contamination compared to earlier in the disease course. In settings where exposure to persons shedding virus has been prolonged, such as the home or during a hospital admission, it may be prudent to disinfect surfaces more meticulously [4, 5]. Multiple surfaces with detectable MPXV DNA have also been identified in rooms of hospitalized patients with MPXV infection [5]. Viral culture to detect viable virus, especially for samples with high Ct values, and assessing for the presence of MPXV in outpatient settings earlier in the course of infection and in the home are needed to further inform the role of fomite transmission of MPXV infections.

Notes

Patient consent. Written informed consent was obtained for every patient. The research ethics board at each participating institution approved the design of the study.

Financial support. This study was funded by a grant from the Emerging and Pandemic Infections Consortium, Temerty Faculty of Medicine, University of Toronto. D. H. S. T. is supported by a Tier 2 Canada Research Chair in HIV Prevention and STI Research. S. M. is supported by a Tier 2 Canada Research Chair in Mathematical Modeling and Program Science.

Potential conflicts of interest. D. H. S. T. reports support to his institution for investigator-initiated research from Gilead Sciences and AbbVie, and support to his institution for clinical trials sponsored by GlaxoSmithKline. All other authors report no potential conflicts.

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Received 30 September 2022; editorial decision 18 November 2022; accepted 06 December 2022; published online 26 December 2022

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https://doi.org/10.1093/ofid/ofac648