Major article

Face touching: A frequent habit that has implications for hand hygiene

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- Medical students
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Background: There is limited literature on the frequency of face-touching behavior as a potential vector for the self-inoculation and transmission of *Staphylococcus aureus* and other common respiratory infections.

Methods: A behavioral observation study was undertaken involving medical students at the University of New South Wales. Their face-touching behavior was observed via videotape recording. Using standardized scoring sheets, the frequency of hand-to-face contacts with mucosal or nonmucosal areas was tallied and analyzed.

Results: On average, each of the 26 observed students touched their face 23 times per hour. Of all face touches, 44% (1,024/2,346) involved contact with a mucous membrane, whereas 56% (1,322/2,346) of contacts involved nonmucosal areas. Of mucous membrane touches observed, 36% (372) involved the mouth, 31% (318) involved the nose, 27% (273) involved the eyes, and 6% (61) were a combination of these regions.

Conclusion: Increasing medical students’ awareness of their habituated face-touching behavior and improving their understanding of self-inoculation as a route of transmission may help to improve hand hygiene compliance. Hand hygiene programs aiming to improve compliance with before and after patient contact should include a message that mouth and nose touching is a common practice. Hand hygiene is therefore an essential and inexpensive preventive method to break the colonization and transmission cycle associated with self-inoculation.

Infections may be transmitted by self-inoculation. Self-inoculation is a type of contact transmission where a person’s contaminated hands makes subsequent contact with other body sites on oneself and introduces contaminated material to those sites. Although the literature on the mechanisms of self-inoculation of common respiratory infections (eg, influenza, coronavirus) is limited, contaminated hands have been reported as having potential to disseminate respiratory infections. *Staphylococcus aureus* is carried in the nasal mucosa in approximately 25% of the community and, may be self-inoculated, via face touching, by individuals who are frequently exposed to potential carriers in both the community and health care settings.

During the influenza A (H1N1) pandemic, face-touching behavior in the community was commonly observed with individuals touching their faces on average 3.3 times per hour. In the health care setting, frequent face touching, particularly during periods of seasonal endemcity or outbreak, has the theoretical potential to be a mechanism of acquisition and transmission. However, quantifying the role of face touching in the spread of respiratory infections or *S aureus* colonization is difficult for several reasons. First, such a study would require enrollment, screening, and prospective follow-up of a large population to identify a significant causal link. Second, the study would need to observe transmission occurring in community settings, rather than in isolation or under laboratory conditions, which would be ethically challenging. Finally, there are likely to be confounding factors, such as virulence of pathogens, varying susceptibility of the study population, and effects of modes of transmission other than hand to face contamination, that cannot easily be controlled.

A self-inoculation event may occur if a health care worker (HCW) fails to comply with hand hygiene after patient contact.
A behavioral observation study was undertaken involving phase 3 medical students at the University of New South Wales (UNSW). Ethical approval was obtained from the UNSW Human Research Ethics Committee prior to the commencement of the study. The student cohort had completed a one 4-hour infection control course in the previous 12 months. The infection control study was being conducted during the lecture and 2-hour lecture commenced, students were informed that a behavioral observation study was being conducted during the lecture and no obvious role has yet been attributed to colonized staff.7 Nasal carriage of S. aureus is common and ranges from 20%-30% in health care and community settings.7 Nose touching was common among our participants. This finding supports the importance of hand hygiene as a means of preventing occupationally acquired colonization with S. aureus from patients or the contaminated environment.8,10,20,21 Good hand hygiene before and after patient contact is imperative to prevent transmission of infection. This is particularly so during the symptomatic or asymptomatic prodromal stages of infections when patients shed infectious material.17 In particular, clinicians caring for infectious pediatric patients with high shedding concentrations17,18 may be at risk of acquiring an infection if they have a high level of face-touching behavior.19

S. aureus is a common pathogen prevalent in both community and health care settings. Colonization of the nasal mucous membranes with S. aureus is common and ranges from 20%-30% in health care and community settings.7 Nose touching was common among our participants. This finding supports the importance of hand hygiene as a means of preventing occupationally acquired colonization with S. aureus from patients or the contaminated environment.8,10,20,21 S. aureus can survive for up to 5 years on hard surfaces, and no obvious role has yet been attributed to colonized staff.7 When mixed with hospital dust, S. aureus can still survive for >1 year until it is picked up from the environment.22,23 Contaminated hands may act as a vector, transmitting the bacteria from a contaminated surface to the HCW’s nasopharynx via face touching. High hand hygiene compliance before and after patient contact should reduce the likelihood of transferring pathogens through.
self-inoculation and in turn prevent inoculation of patients.20,24,25 Pathogens found on stethoscopes have also been recovered from physician’s hands.26 Given the habitual face-touching behavior observed in our study, it is possible that the inoculation of stethoscopes and other contaminated medical equipment may have been the result of inoculation from nose touching to hands and subsequently to the stethoscope. Given the frequency of face-touching behavior observed in this study, clinicians must practice hand hygiene before and after using such equipment to ensure that patient equipment is kept clean prior to use.

Given the high frequency of mouth and nose touching observed, 4 times per hour on average for mouth touching and 3 times per hour on average for nose touching, performing hand hygiene is an essential and inexpensive preventive method for breaking the colonization and transmission cycle. Models of infection transmission and comparison of transmission efficiency of self-inoculation against other transmission routes are required to further expand our knowledge on the role of face touching for self-inoculation. Meanwhile, raising awareness that face-touching behavior is common and is a possible vector in self-inoculation could result in HCWs accepting the message that hand hygiene before and after patient contact is an effective method of reducing colonization and infection transmission for themselves and their patients.

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References