Behavioral considerations and impact on personal protective equipment use: Early lessons from the coronavirus (COVID-19) pandemic

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In this issue of the JAAD, Lan et al[1] provide preliminary data on the prevalence of cutaneous irritation associated with using personal protective equipment (PPE) by health care workers (HCWs) during the early months of the coronavirus 2019 (COVID-19) outbreak in Wuhan, China. The authors highlight the high prevalence of cutaneous irritation associated with N95 mask and goggle use—echoing previous reports highlighting cutaneous adverse events associated with PPE use for severe acute respiratory syndrome[2]—and their data suggest that increased duration of PPE use may be associated with an increased risk of cutaneous irritation.

Given that most cases of PPE-associated skin irritation are clinically mild, why should dermatologists and frontline HCWs worry about mild, self-limited, pressure- and abrasion-induced injuries?

Although HCWs and the general public often focus on direct droplet spread to mucosa as a means of infection, research has highlighted the role of behaviors such as face touching in the spread of viral disease.[3-5] Indeed, the role of face touching and surface contact has been recognized as a driver of viral transmission for decades,[6] and a meta-analysis demonstrated that hand washing was associated with a 24% reduction in viral transmission, suggesting that hand-to-face contact may play a substantial role in infection.

The presence of even mild abrasions on the central face may increase the likelihood of face touching while not using PPE or inadvertent PPE protocol breaches, such as mask touching or adjustment, in an unconscious effort to relieve a source of irritation.

The importance of adherence to strict PPE protocols is paramount, as the infection of 2 HCWs during the Ebola outbreak was tied to possible PPE protocol adherence breaches.[7] Inappropriate doffing of PPE in HCWs is common: 1 study found that 26% of HCWs inappropriately touched the front of their mask while doffing, and approximately one-half touched a potentially contaminated PPE surface with an ungloved hand.[7]

What can be done to limit these risks? First, educating HCWs to expect some mild skin irritation may be helpful.

Second, if topical agents are used to reduce irritation, this could be considered a high-risk activity, and introducing topical ointment to the skin should be done with great care; for example, using a sterile cotton-tipped applicator and a single-use petroleum jelly pack before possible exposure.

Third, those with a history of sensitivity may wish to explore other options aside from an N95 respirator and goggles, such as a full-face respirator or using a full-face shield rather than goggles. Given their added cost and decreased availability, however, these may not be feasible options.

Finally, Lan et al mention the possibility of prophylactic dressing use to mitigate the risk of skin-related complications of PPE use, but this approach has not been studied, and—more importantly—the potential impact of such dressings on PPE efficacy is unexplored. Given the very high stakes associated with adequate and reliable PPE functioning, future studies exploring approaches to mitigate the risk of PPE-induced irritation and potential improvements in PPE design are warranted.

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