

“Physical” Aspect of COVID Nursing

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ABSTRACT

The use of personal protection equipment (PPE) is associated with physical and physiological derangements. Healthcare workers are at the forefront of the fight against COVID-19 and are continuously exposed to PPE. This editorial discusses a survey carried out by Jose et al. capturing the physical problems associated with PPE use.

Keywords: COVID-19, PPE-related dermatitis, PPE-related health problems.

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Coronavirus disease (COVID) pandemic continues its unpredictable spread and behavior. While India seems to be having a respite with lesser new patients being reported, the threat of a new variant spreading more efficiently looms large. The pandemic has stretched the resources of healthcare structures across political, geographical, and socioeconomic strata. Healthcare workers (HCWs) have been subjected to the problem of repeated exposure to patients with varying viral load. Personal protection equipment (PPE) has come into focus like never before as a consequence. Access to PPE, their quality, and the problems arising from the use of PPE are the issues which have come into focus in the past year. Among the HCWs who need to don the PPE for the longest length of time are the intensive care unit (ICU) nurses considering patient load and the demands of caring needed for a sick COVID patient. The working hours and the schedules of nurses have been disrupted and prolonged. Donning the PPE with all due precautions for prolonged periods can logically result in physical and physiological challenges apart from mental and emotional stress.

Increased incidence of adverse skin reactions to the use of PPE among HCWs has been reported.¹ The incidence of headaches with the use of N95 masks has been reported to be around 35%.² In the current issue of the *IJCCM*, Jose et al.³ attempt to describe the health problems and skin damage related to the use of PPE among ICU nurses in a COVID center in India. This was a cross-sectional study carried out using an online questionnaire developed in-house. The duration of use of PPE among this cohort was 6 hours per day which is the least duration of a COVID shift in India. Data were collected based on the reported problems arising after 7 days of use. The respondents were requested to correlate the adverse effect with the PPE component presumed to be responsible. It is noted that different airway protection equipment may be associated with varying side effects.⁴ While an N95 mask user may hypoventilate resulting in headache and dizziness, elastomeric half-mask respirators could cause relative hypoxemia. Powered air-purifying respirators, though safer, could contribute to a discomfort from constant noise.⁴ The study by Jose et al. was conducted in September, a good 6 months after the onset of the pandemic in India. This would mean that the cohort had enough time to get accustomed to the proper use of PPE. The response rate for the questionnaire was high (91%). This is on par with other similar surveys done elsewhere in the world.⁵ The mean age of the respondents to this survey was 30.4 years. Hu et al. also reported a similar age group in their evaluation of adverse skin reactions

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among HCWs.⁵ Close to three-fourths of the cohort in this current survey had more than 5 years’ experience in the ICU. The point to be understood is that young experienced nurses were exposed to problems not anticipated or experienced before. The authors mention a period of training prior to the designation of the nurses to COVID care. This activity seems to be important to prepare them for the physical problems caused by the use of PPE. The current survey reports headache as the most common adverse effect followed by sweating and difficulty breathing. Atay et al.⁶ reported an incidence of 50% for headaches with the use of N95 masks. This is attributed to the hypoventilation when the mask is used for a prolonged period of time. Reduced cognition and increased work of breathing are also attributed to the hypoventilation caused by the long duration of N95 mask usage.⁴ Extreme sweating was reported in more than 50% of the users in the current cohort. The prevalence of this side effect ranges from 45% to 61% in various cohorts.⁴ Skin reactions are reportedly common with the use of PPE and masks given the emphasis on “tight fitting” and relative impermeability. More than three-fourths of the respondents experienced nasal bridge scarring and ear pain, which is comparable to the incidence in other published data.^{4,5} The dermatological problems associated with the N95 mask use are more common after 6 hours of its use.⁷ The mean duration of a shift in this study probably explains the correlation. Limiting the number of hours of use of N95 masks to 2 to 4 hours is a proposed solution which might be impractical given the shortage of PPE and the repeated interruptions to patient care this may produce. The “tight-fit” concept necessitates tight ties or ear loops. Using ties instead of loops may reduce the chances of ear pain and skin damage, but may result in failed “fit tests.”

Minimizing these problems has to be balanced against the safety of HCWs and the continuity of patient care. Timed breaks in a designated place might reduce the effects of hypoventilation

and hypoxemia. Dehydration seems to be a commonly reported issue with the use of relatively impermeable PPE. The physiological effects of hypoventilation like headache and dizziness could be exacerbated by dehydration.⁴ A recommendation for 1 ml of fluid for every gram of weight lost at the end of the shift has been proposed as a rule of thumb. Use of appropriate moisturizers at least 30 minutes prior to donning the PPE is suggested as a means of avoiding skin irritation and rashes. Application of emollients to the area of contact of the mask loops/ties and noseclips can help reduce the injuries caused by these two essential parts of a PPE mask. The use of barrier-dressing tapes under the masks, although suggested by the British Association of Dermatologists, may compromise the seal for the mask. Adding a surgical mask to line the inside of an N95 mask is also an effective way to reduce skin reactions.⁷ These steps were not captured in the current survey. Administrative support and frequent inquiries about the well-being of the HCWs might help identify the problems early and initiate the remedial measures sooner. The duration of PPE use and the development of adverse effects on the skin are not clearly linked temporally. However, a 7-day mandatory use as in this study could be associated with more advanced problems being reported. Several stages of pressure injury have been identified ranging from nonblanchable erythema (stage 1) to full-thickness skin and tissue loss (stage 4). These stages have not been captured in this study. Prevention seems to be most effective in stage 1. Application of moisturizers without zinc at least two hours prior to donning the PPE has been recommended. Use of alcohol-free skin barrier wipes or protectants 5 minutes prior to donning the PPE seems to act as a supplementary preventive measure. Skin damage or desquamation has been reported in 10 to 26% of incidences of cutaneous problems associated with PPE.⁵ The current survey is limited in this regard since a physical assessment of the stage of injury could not be carried out.

It is highly commendable that Jose and colleagues have chosen to highlight a practical problem faced by the HCWs in general and nurses in particular. It would be interesting to see what remedial measures were initiated by the authors based on the findings of this

survey. The sample size is too small to make a general conclusion, as with other similar surveys. However, this survey addresses the important aspect of monitoring the health and the well-being of the frontline HCWs, especially the nurses. It is about time that the professional bodies for nurses in India bring out guidelines and advisories for their members to guide them while dealing with such inevitable hazards of professional life.

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