

LETTER TO THE EDITOR

Treatment of nasal bridge ulceration related to protective measures for the COVID-19 epidemic

Dear Editors,

Health care workers (HCWs) in the front line against COVID-19 are exposed to skin barrier damage. Effective use of personal protective equipment (PPE) is of paramount importance to reduce the rates of infection among medical personnel, which is a leading cause of nosocomial spread among hospitalised patients and of loss of response capacity for health facilities, with HCWs constituting up to nine percent of total COVID-19 cases.^{1,2} Cleaning- and glove- related hand protection and mask- and goggles-related face protection play a substantial role in preventing the spread of the virus not only from respiratory droplets directly to mucosa but also from indirect surface contact through hand-to-face touching.³ Skin damage related to protective measures is common, occurring in up to 97.0% of frontline HCWs; the main target skin site is the nasal bridge, which is involved in 83.1% of subjects.⁴ It is thought that the pressure and abrasive effect of goggles combined with the N95 mask are responsible for lesions observed in this site, ranging from mild irritations to erosions and ulcers.⁴ In addition, some individuals may be sensitised to components of N95 masks requiring the use of different full-face equipment that may not be widely available.⁵ Risk of skin lesions in HCWs increases for N95 masks or goggles when they are worn for over six consecutive working hours, but not for full-face shields.⁴ Also, HCWs commonly wear face masks after shifts. Discomfort due to irritation may lead to improper PPE use or inadvertent face touching while damaged skin barrier adds an entry route for COVID-19.⁶

What measures can we adopt to treat and to ultimately prevent occupational injuries to the skin and related risk of infection that threaten to reduce the active hospital workforce during the COVID-19 epidemic?

We present the case of a nurse who consulted our Dermatology Department complaining itching ulceration of the nasal bridge developing after implementation of enhanced protective measures. The subject is employed in an inpatient ward of our hospital, requiring the continuous use of an N95 mask through daily 8-hour work shifts. No personal history of skin complaints or contact allergen sensitisation was reported. Skin examination showed an area of non-blanchable erythema and

abrasion involving the epidermis clinically suggestive for a superficial grade 2 pressure ulcer (Figure 1A). We prescribed the application of a thin hydrocolloid dressing (Duoderm CGF, ConvaTec Inc, Greensboro, North Carolina) cut to a diamond shape above the lesion in order to provide secure protection from mechanical injury and infection while encouraging healing processes. We reassessed the patient after 72 hours, appreciating the return to intact skin (Figure 1B).

Burning sensation and itching associated with skin damage is reported in up to 71% of HCW wearing enhanced PPE during the current epidemic, according to a study involving 330 subjects.⁷ Cutaneous lesions range from mild erythema to papules and pustules to maceration of the skin. Moreover, prolonged use of face protection may cause vesicles and blisters due to persistent friction that eventually rupture and expose the underlying skin to the entry of pathogens. Masks and goggles must be firmly applied to the face to be effectively protected, further increasing the pressure on the nose. Some authors suggest the application of emollient creams or of hydropathic gauze soaked in cold water or saline solution for about 20 minutes to maintain skin integrity and protect from the risk of lesions, while the use of iodopovidone dressing together with local antibiotics is recommended in case of injuries.⁷ However, these measures do not protect against pressure injury, and incorrect application of moisturisers before and after wearing PPE may be responsible for an increased risk of infection.⁸ Patients requiring non-invasive ventilation (NIV) provide an excellent study model for the management of pressure lesions on the nasal bridge as the high pressure generated by the ventilator mask for a prolonged time, together with the influence of shear stress between inspiratory and expiratory phases, determines a high risk of ulcer formation in this site.⁹ A 2019 study analysed the use of hydrocolloid medication in patients requiring NIV demonstrating a significantly reduced incidence of grade 2 pressure ulcers when a preventative hydrocolloid dressing was positioned on the nasal bridge compared with when the NIV mask was directly applied.¹⁰ Hydrocolloids consist of dressings, with variable absorbability, elasticity, and strength that are made of hydrophilic particles, such



FIGURE 1 Non-blanchable erythema and abrasion on the skin area of pressure between the nasal bridge and the N95 mask (A). Return to intact skin after application of a thin hydrocolloid dressing cut to a diamond shape above the lesion (B)

as pectin, carboxymethylcellulose, and polymers, within a gelatinous substance. Hydrocolloids are widely used in the treatment of ulcers with mild exudate, specifically those induced by pressure and those of the lower limbs. The application of hydrocolloids to the treatment and prevention of pressure ulcers of the nasal bridge is supported by the specific properties of these advanced medications.¹¹ Dressings are self-adhesive to both dry and oily skin—such as that of the forehead, nose, and chin, which is particularly rich in sebaceous glands—, absorbent, reducing the risk of maceration, impermeable to gas, water, and vapour, reducing the risk of infection even through droplet transmission.

In conclusion, during this period of emergency, all measures must be taken to limit virus spread in the hospital environment, and the effective use of PPE is of vital importance for the safeguard of HCWs and patients. However, the correct application of devices to the face carries an increased risk of erosive and ulcerative skin lesions, which may result in reduced efficacy of protection

protocols and risk of pathogen entry. We propose the use of a hydrocolloid dressing that successfully treated nasal bridge ulceration in our patient, to be applied as a simple and effective protection procedure in this setting, thanks to the specific properties of this advanced medication.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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REFERENCES

- Boccia S, Ricciardi W, Ioannidis JPA. What other countries can learn from Italy during the COVID-19 pandemic. *JAMA Intern Med.* 2020. <https://doi.org/10.1001/jamainternmed.2020.1447>. [Epub ahead of print].
- Elston DM. Letter from the editor: occupational skin disease among healthcare workers during the Coronavirus (COVID-19) epidemic. *J Am Acad Dermatol.* 2020;82(5):1085-1086.

3. Kwok YLA, Galton J, McLaws ML. Face touching: a frequent habit that has implications for hand hygiene. *Am J Infect Control*. 2015;43(2):112-114.
4. Lan J, Song Z, Miao X, et al. Skin damage among healthcare workers managing coronavirus disease-2019. *J Am Acad Dermatol*. 2020;82(5):1215-1216.
5. Donovan J, Kudla I, Holness LD, Skotnicki-Grant S, Nethercott JR. Skin reactions following use of N95 facial masks. *Dermatitis*. 2007;18(2):104.
6. Cavanagh G, Wambier C. Rational hand hygiene during COVID-19 pandemic. *J Am Acad Dermatol*. 2020. <https://doi.org/10.1016/j.jaad.2020.03.090>. [Epub ahead of print].
7. Yan Y, Chen H, Chen L, et al. Consensus of Chinese experts on protection of skin and mucous membrane barrier for health-care workers fighting against coronavirus disease 2019. *Dermatol Ther*. 2020;e13310.
8. Kantor J. Behavioral considerations and impact on personal protective equipment (PPE) use: early lessons from the coronavirus (COVID-19) outbreak. *J Am Acad Dermatol*. 2020;82(5):1087-1088.
9. Dellweg D, Hochrainer D, Klauke M, Kerl J, Eiger G, Kohler D. Determinants of skin contact pressure formation during non-invasive ventilation. *J Biomech*. 2010;43(4):652-657.
10. Bishopp A, Oakes A, Antoine-Pitterson P, Chakraborty B, Comer D, Mukherjee R. The preventative effect of hydrocolloid dressings on Nasal bridge pressure ulceration in acute non-invasive ventilation. *Ulster Med J*. 2019;88(1):17-20.
11. Moore ZEH, Webster J. *Dressings and topical agents for preventing pressure ulcers*. 2013, *Cochrane database of systematic reviews*. Chichester, England: John Wiley and Sons Ltd; 2013.