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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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Facial dermatoses in health care professionals induced by the use of protective masks during the COVID-19 pandemic

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The use of face masks is mandatory in many countries in order to prevent transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) during the ongoing coronavirus disease pandemic (COVID-19) pandemic.^{1,2} In Denmark, it was mandatory to wear face masks at all hospitals during November 2020 to June 2021.² However, the increased use of face masks may lead to facial skin complaints. To access the nature of these adverse reactions, our department opened for referral of staff from all departments at our hospital if significant skin problems were associated with the use of face masks.

CASE REPORTS

A total of 14 health care workers were seen from December 2020 to April 2021 (see supporting information S1). All patients but one underwent extensive patch testing following the recommendations of the European Society of Contact Dermatitis.³ In 10 patients, the final

diagnosis was irritant contact dermatitis likely caused by mechanical friction, as the face masks were made of coarse fibers (Figure 1A).

Allergic contact dermatitis was the diagnosis in three patients. In one case, the allergy was iatrogenic; the patient's facial dermatitis was treated with topical corticosteroids and she subsequently developed contact allergy to hydrocortisone-17-butyrate. In the following two cases, the allergic contact dermatitis was induced by the face masks.

A surgical nurse with no previous contact allergies developed dermatitis at the nose bridge and periorbital area after exposure to a newly imported brand of surgical masks at work (Figure 1B). The patch test revealed a strong positive (+2) reaction to nickel sulfate with no other exposures than the surgical mask. The dimethylglyoxime (DMG) test was positive, indicating that the metal wire in the surgical mask contained nickel (Figure 1C). Re-exposure to the mask(s) elicited the dermatitis (Figure 1B).

A medical doctor working at an infectious diseases and COVID-19 department experienced facial erythema after exposure to FFP3

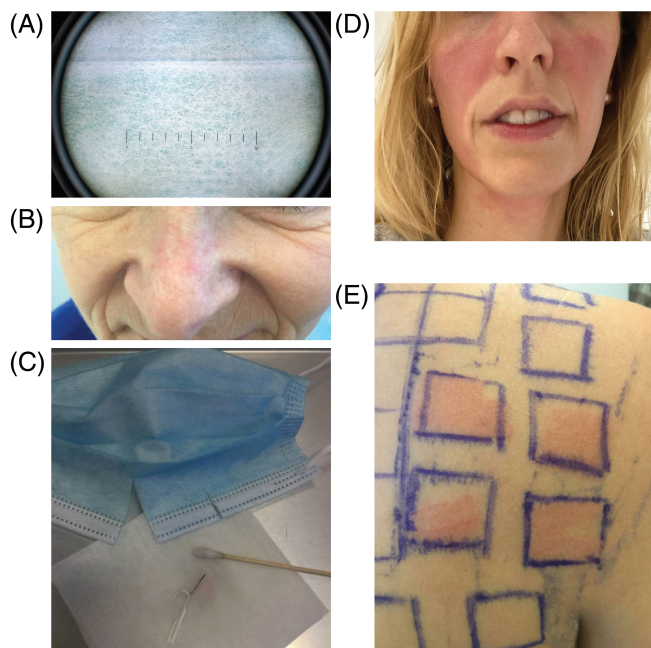


FIGURE 1 Clinical pictures showing the woven fibers in a surgical mask leading to friction dermatitis and allergic contact dermatitis induced by a surgical mask and a FFP3 mask. (A) Close-up picture of a surgical mask showing the woven fibers; (B) dermatitis at the nose bridge elicited by a surgical mask due to a newly developed contact allergy to nickel in a nurse; (C) a positive dimethylglyoxime (DMG) test of the metal wire in the surgical mask (B); (D) facial erythema after exposure to FFP3 masks in a medical doctor; (E) positive patch-test results to different parts of two FFP3 masks

masks at work, with clearance of the erythema during time off (Figure 1D). Patch testing revealed a strong positive (+2) reaction to the FFP3 masks but without any other positive reactions (Figure 1E). It has not been possible to obtain further information about the components in the FFP3 masks from the manufacturer.

DISCUSSION

A few reports of facial dermatoses have emerged following the intensified use of facial protective masks.^{4,5} To our knowledge this is the first report on likely induction of nickel allergy from the metal thread in face masks. It is easy to overlook this exposure source.

The labeling of medical devices in the EU is unfortunately not as tightly regulated as, for example, ingredient labeling of medical products and cosmetics.⁶ This is also exemplified in one of our cases where it was impossible to obtain further information despite a patient being sensitized to her FFP3 masks. Hence, ingredient labeling should be introduced for medical devices such as face masks. Based on these

results we recommend a thorough approach in the management of patients with newly developed facial dermatitis due to the use of face masks.

CONFLICT OF INTERESTS

All authors declare no conflicts of interests.

AUTHOR CONTRIBUTIONS

Anne Simonsen: Conceptualization; investigation; methodology; project administration; writing-review & editing. **Claus Zachariae:** Conceptualization; investigation; methodology; project administration; supervision; writing-review & editing. **Jeanne Duus Johansen:** Conceptualization; investigation; methodology; project administration; supervision; writing-review & editing.

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