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COVID-19 pandemic and the skin: what should dermatologists know?

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Abstract The world has changed dramatically since the COVID-19 pandemic began. In addition to our social, occupational, and personal lives, the new coronavirus also poses novel challenges for all physicians, including dermatologists. Several skin conditions have emerged, mainly as a result of prolonged contact with personal protective equipment and excessive personal hygiene. Pressure injury, contact dermatitis, itch, pressure urticaria, and exacerbation of preexisting skin diseases, including seborrheic dermatitis and acne, have been described. We have focused on the dermatologic aspects of the COVID-19 infection so that dermatologists are aware of the skin complications and preventive measures can be taken in the COVID-19 pandemic.

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Introduction

In December 2019, pneumonia of unknown cause was detected in Wuhan, China. It was later disclosed that the new (novel) type of coronavirus causes respiratory disease spreading from person to person. The outbreak was declared a Public Health Emergency of International Concern on January 30, 2020, and on February 11, 2020, the World Health Organization defined the new coronavirus disease as COVID-19.¹ Since then, the pandemic has spread to all continents except Antarctica. By mid-March 2020, there were more than 200,000 cases reported worldwide. Whereas it took 12 weeks to reach the first 100,000 cases, it took only 12 days to reach the next 100,000.¹ In the United States, more than 10,000

cases and a total of 150 deaths from COVID-19 infection had been reported by March 21, 2020.²

With the current global pandemic, dermatologists, like all physicians, should be aware of the COVID-19 infection and any associated skin manifestations.

COVID-19 infection and the skin in humans

The tropism of the virus for the structures of the bronchial mucosa and the immune system cells with a typical histopathologic pattern has been demonstrated by using autopsy specimens from the lung, heart, kidney, spleen, bone marrow, liver, pancreas, stomach, intestine, thyroid, and skin.³ Although the infection also involves the heart, vasculature, liver, and kidney, the typical skin pattern was not initially described. Subsequently, mucosal membranes have been identified as the most common entry for the infection, and this includes the

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conjunctiva with the otic canal having the lowest risk of transmission⁴; therefore, specific skin changes due to the COVID-19 infection had not been described, and one could expect an iatrogenic secondary involvement of the skin.

Because diseases with an epidermal barrier interruption could enhance the virus acquisition through an indirect contact,⁵ dermatology patients might be at an increased risk for developing the infection. This suggests that dermatology departments and private offices should develop appropriate preventative measures.⁵ The use of a sanitary mask itself may not give sufficient protection from the virus transmission, and so goggles should also be used to decrease the risk of conjunctival contamination. COVID-19 has a relatively low resistance to disinfectants. As a result, a variety of regimens have been proven effective, ranging from 75% ethanol, peracetic acid, chlorine, and UV disinfection to a hot water bath at 56°C (132.8°F) for 30 minutes.⁴

Another important practical concern is the care for patients with autoimmune and chronic inflammatory disorders, such as psoriasis, atopic dermatitis, lupus, scleroderma, and hidradenitis suppurativa, which may require immune-suppressive therapy. It is not clear whether the administration of the biologics should be delayed.

Skin problems related to personal protective equipment and personal hygiene measures

The skin complications in the COVID-19 infection were initially due to the hyperhydration effect of personal protective equipment (PPE), friction, epidermal barrier breakdown, and contact reactions, all of which may aggravate an existing skin disease. The dermatologic manifestations are far different from

those recorded during the influenza epidemic of 1918 to 1919.⁶ Erythema, papules, maceration, and scaling are the most commonly reported skin changes caused by extended wear of PPE⁶ (Figure 1). Clinical manifestations have included burning, itching, and stinging. Such findings have been attributed to the use of PPE in 97.0% of 542 frontline health care workers. The most commonly affected skin sites were the nasal bridge (83% due to the use of protective goggles but not the hygiene mask), cheeks, forehead, and hands.⁶ The prolonged contact with masks and goggles may cause a variety of cutaneous diseases, ranging from contact and pressure urticaria or contact dermatitis to aggravation of preexisting dermatides.⁴ A former study pointed out that more than one-third of health care workers complained of acne, facial itching, and even dermatitis from wearing an N95 mask.⁷

The use of protective hats and the accompanying occlusions may induce pruritus and folliculitis or exacerbate seborrheic dermatitis.⁴ The long-term use of protective gloves leads to occlusion and a hyperhydration state of the epidermis clinically observable as maceration and erosions,⁴ possibly leading to the development of contact dermatitis. Exaggerated hand washing with detergents/disinfectants can impair the hydro-lipid mantle of the skin surface and may also be responsible for irritation and even the development of contact dermatitis (Figure 2). Two-thirds of health care workers will wash their hands over 10 times a day, but only 22% are applying skin protective cream.⁷

The atopic diathesis, low humidity, frequency of hand washing, wet work, glove use, and duration of employment are important risk factors for the development and/or aggravation of hand dermatitis.⁶ In terms of contact dermatitis prevention, we recommend applying skin protective cream frequently, especially after hand washing and before applying PPE.⁴



Fig. 1 Facial erythema and papules accompanied by burning and itching in a 42-year-old female patient who disinfected her face with 60% ethanol 5 times daily and used a protective facial mask for 6 hours a day.



Fig. 2 Hand dermatitis resulting from excessive hand washing as a preventive measure in the COVID-19 transmission.

Administrative issues

Since the outbreak of the COVID-19 pandemic, a restructuring of the dermatologic practices is needed. In Bulgaria, several dermatologic wards have been transformed into “covidaria,” using the pandemic-designated hospital structure for the treatment and isolation of patients with a COVID-19 infection. A great number of private dermatology practices have temporarily closed doors. In addition, the scientific communication between dermatologists has been hindered with the cancellation of scientific meetings and academic sessions.

A recent paper underlines the importance of patient triage at the entrance of a dermatology clinic and even the private office to regulate the clear versus dirty flow.⁷ Where possible, it may prove prudent to conduct outpatient visits with teledermatology or postpone such consultations for nonemergency patients and those with fewer skin ailments. Where appropriate, wearing an N95 mask (a PPE used to protect the face from airborne particles and liquids with very small dimensions of 0.3 micron) and hand hygiene are recommended during a patient visit.⁶

Conclusions

The skin and COVID-19 interactions, as well as the consequences to the skin and mucous membranes of increased personal hygiene measures, should be recognized by dermatologists and their coworkers. The use of precautionary measures, including emollients, barrier creams, and moisturizers, is es-

sential in preventing skin complications aggravated by preventive steps taken during the pandemic.⁸

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