

Case Report

The Unwanted Veil: A Pediatric Case of a Dermatologic Complication Following a COVID-19 Infection

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Abstract

One week after contracting COVID-19, an 8-year-old African American girl developed a rash covering her face and parts of her arm. This rash resolved after four weeks after treatment with Pimecrolimus cream and barrier repair cream. While no unique exanthem is associated with COVID-19, it has been linked to various cutaneous symptoms. As a result, healthcare providers must be aware of this potential link while examining their patients and be prepared to give counseling to help patients cope with any psychological stress connected with these symptoms.

Keywords: Dermatology; Pediatrics; Skin manifestations; COVID-19; Virus diseases

Introduction

Typically, SARS-CoV-2 (COVID-19) infections manifests with ear, nose, throat, and pulmonary features. Recently however, COVID-19 has been linked to an increase in various hair and skin conditions. It is unclear if these cutaneous symptoms of COVID-19 are produced by the virus or result from the infection's physical and psychological stress and anxiety. The most prevalent mucocutaneous signs of the coronavirus include maculopapular rash, urticaria, or acral vasculopathic rashes (pseudo chilblains, pernio-like lesions) described as the "COVID toe," with patients developing the characteristic symptoms of COVID-19 a few days later [1]. New retrospective research published in 2022 by the *Journal of Medicine and Life* shows a strong association between a positive COVID-19 PCR test and hair loss in people aged 18 to 85. Telogen effluvium, a diffuse hair loss that appears weeks after a significant stressor, is the most prevalent hair condition linked with COVID-19 [2]. To understand the pathogenesis of these dermatological conditions, we must first comprehend the COVID-19 infection on a cellular level. COVID-19 gains entry to human cells via binding of spike protein to ACE2 receptor. Scientists used immunohistochemistry to find the expression of ACE2 receptors in many cells, including sweat glands and keratocytes. These findings also allude to the possibility of Coronavirus transmission through the skin [3].

Case Presentation

An 8-year-old African American girl arrived at the clinic with her father to be evaluated for a rash. The rash is located on her

face and parts of her arm. In 2017, she migrated from Africa to the United States. She has no prior surgical history. She lives with her parents and brother and has never been exposed to cigarette smoke. In addition, she has no significant past medical history. The patient was diagnosed with COVID-19 approximately two weeks ago and recovered without any major implications. The rash appeared a week after the COVID-19 infection around the mouth and now covers her entire face. The patient states that the lesions are mildly pruritic. Her parents are very concerned that this rash might permanently disfigure her skin. Father also reports that she prefers to stay home until these skin lesions improve (Figure 1).



Figure-1 : picture taken on 9/27/2022

Figure 1

This non-blanching papular rash is accompanied by a dry and scaly lesion around her mouth. She has not noticed any oozing or bleeding from the rash. Her skin was completely smooth prior to this rash, and she never experience facial acne in past. Parents have been using moisturizer judiciously, but no improvement of the rash has been noted. It spares her palms and soles, mostly on her forehead and cheeks.

The patient denied having any contact with similar symptoms and recent travel history. On the review of systems, she also rejected experiencing headaches, vision changes, confusion/memory loss, and shortness of breath, cough, congestion, abdominal pain, nausea, vomiting, constipation, diarrhea, flank pain, or hematuria.

Scarlet fever was ruled out by the negative results of the Antistreptolysin O (ASO) titer test. However, she tested positive for COVID-19 via polymerase chain reaction. The patient was prescribed Pimecrolimus cream (Elidel) to be used twice daily, as well as a ceramide-containing facial cream to be used on top of the Pimecrolimus cream. Four weeks later, the patient returned to the clinic, and her dermatological symptoms had completely resolved.

Discussion

The most characteristic COVID-19 symptoms include fever, cough, exhaustion, and loss of taste and smell. However, prospective research in Italy found that up to 20.4% of participants experienced cutaneous signs of COVID-19 infection [4]. The COVID-19 virus has been linked to various cutaneous symptoms, including maculopapular rash, urticaria, vesicular rash, petechia, purpura, and chilblains [5].

This is by no means a comprehensive list, and these are merely the most reported symptoms. Cutaneous signs of COVID-19 have been associated with a variety of different etiologies. One of these theories proposed that these cutaneous symptoms are due to microvascular vasculitis caused by oxidative stress, complement activation, and complement deposits in the skin. In one study, a considerable quantity of complement protein was found in the dermal capillaries and interstitial and perivascular neutrophilia with significant leukocytoclasia, indicating a vasculitic phenomenon [6].

Another theory proposed COVID-19 virus itself is the cause of these cutaneous symptoms [7]. COVID-19 virus activates many inflammatory cytokines and leads to the activation of cytotoxic and natural killer lymphocytes. In return, cytotoxic and natural killer lymphocytes cause dermatitis and necrosis of many keratinocytes. Additionally, they located a group of Langerhans cells in the skin biopsy of patients with cutaneous symptoms of COVID-19, a common finding in viral-induced skin dermatitis [7]. These cutaneous symptoms of COVID were commonly found on the trunk and extremities. Many of the cases studied were accompanied by mild pruritis, and they typically subside within eight days [4].

In our case, the rash resembled the cutaneous presentation of scarlet fever and had a sand paper texture. Contrary to scarlet fever rashes, it lacks the associated erythema and is not blanching. The negative results of the Antistreptolysin O (ASO) titer test rule out scarlet fever as a possible diagnosis. The timing of the symptoms in connection to COVID infection, a positive COVID-19 PCR test, and the absence of new skincare products suggest a COVID-19 dermatological manifestation.

Additionally, her symptoms were relieved with the Pimecrolimus cream, which prevents T-cell activation [8]. Either the reduction in inflammation has resolved her symptoms, or the disease has run its course. Although doctors should be able to reassure patients about COVID-19 skin manifestations, they should not underestimate the psychological stress these visible skin conditions cause.

Many of the cutaneous symptoms of the COVID-19 virus have a broad differential diagnosis; however, clinicians should be cautious when these symptoms appear in the setting of a respiratory infection.

Conclusion

Unlike other viruses, COVID-19 does not have a unique exanthem, and it has not associated with a specific skin condition. COVID-19 patients seem to experience several cutaneous signs, none of which are unique or diagnostic.

The number of COVID-19 patients exhibiting these cutaneous symptoms is unclear. Even though we know how the virus uses ACE2 receptors in keratinocytes, the etiology of these cutaneous manifestations remains unknown. Dermatologists and medical professionals worldwide need to be aware that COVID-19 might be the source of a cutaneous symptom in a patient with a viral prodrome.

Doctors should employ COVID-19 testing to confirm the diagnosis after observing these cutaneous symptoms to rule out COVID infection. Diagnosis and identification of these COVID-19 cutaneous symptoms still require extensive research.

Because of this type of research, clinicians will be more confident in their ability to advise patients on the optimal course of treatment and the predicted duration of these symptoms. In addition to reassurance, clinicians should pay attention to patient's psychological symptoms caused by these skin manifestations and provide counseling as needed.

Author Statements

Authors Contributions

Dr. Alam consented the patient and was the supervising physician during this visit. Shakira Meltan contributed in writing, drafting, and editing of the case report. Both authors have read and approved the final version of this case report.

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Authors Disclosure of Potential Conflict of Interest

All authors declared that they have no conflict of interest.

Patient Consent

The patient consent form was obtained.

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