

## Review Article

## Dermatological Findings in COVID-19 Patients: A Review

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### Abstract

**Introduction:** In the day 16<sup>th</sup> June 2020, the number of deaths is up to 430000 and the confirmed cases are more than 8 million in the world. The dermatology clinical findings on COVID-19 patients were cutaneous manifestations as pressure injury, contact dermatitis itch, pressure urticarial and exacerbation of pre-existing skin diseases, including seborrheic dermatitis and acne

**Objective:** This work means to show the researches doing in dermatology about COVID-19 and the findings related to them

**Methodology:** In this research article were founded in PubMed with free texts, clinical tests and published in the last 5 years

**Results:** Were founded 13 articles published using the terms proposed: dermatology and coronavirus and COVID-19. Five of them were written about cutaneous manifestations of COVID-19

**Conclusion:** Although several cutaneous manifestations had been associated with COVID-19, none so far is specific to this disease. The dermatological approach has been valued and, in the future, It is expected that dermatologists can help both in the early diagnosis of the disease and in its prognosis

**Keywords:** Coronavirus; COVID-19; Dermatology; Treatment

### Introduction

In December 2019, the novel coronavirus was discovered and identified in the viral pneumonia cases occurred in Wuhan, Hubei Province, China, and then was named COVID-19 by the World Health

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Organization (WHO) on 12 January 2020. In the following months it is quickly spreading outside for other countries. In Brazil it becomes in March 2020 and continues increased the number of deaths until then. In the day 16<sup>th</sup> June 2020, the number of deaths is up to 430000 and the confirmed cases are more than 8 million in the world [1].

The dermatology clinical findings on COVID-19 patients were cutaneous manifestations as contact dermatitis-like itch, urticarial lesions, chicken-pox lesions, exacerbation of pre-existing skin diseases, including seborrheic dermatitis and acne, and vasculitic skin lesions [2]. The skin and COVID-19 interactions, as well as the concerns to the skin and mucous membranes of amplified personal hygiene actions, should be predictable by dermatologists. The use of protective measures, including emollients, barriers creams are vital in preventing skin problems intensified by protective steps taken during the pandemic.

Clinical advents of COVID-19 are sporadic or absent in children and teenagers; early clinical detection is important to prevent further dispersion skin lesions and may help clinicians about the severity of the illness, like the presence of vasculitic and necrotic acral lesions in patients with COVID-19 [3].

This work means to show the researches doing in dermatology about COVID-19 and the findings related to them.

### Methodology

This research was doing in the PubMed site (<https://pubmed.ncbi.nlm.nih.gov>) that comprises more than 30 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

In the research we use the terms dermatology and coronavirus and COVID-19 and find articles with free texts, clinical tests and published in the last 5 years.

- The findings are presented as tables and graphics that were founded in the articles.
- All statistic measurements were done to the authors of the articles researched.
- The conclusions presented were expressed the conclusions extracted in the articles except when are properly described as the authors opinion.

### Results

We founded 13 articles published using the terms proposed in methodology. Five of them were written about cutaneous manifestations of COVID-19, other three were about the impact of this disease on daily practice, other three were about the development of immunology response, and two were about psoriasis manifestations. The use of medication as Hydroxychloroquine was cited in one work. The authors' choice was to describe the cutaneous manifestations of the

disease as dermatological findings, for this reason only five of the articles were chosen.

The table 1 shows the target public and their characteristics as described in the five works.

The table 2 shows the principal methodology and results found in these five works.

The table 3 describe the conclusions of the different authors in the articles researched.

Article	Target public	Characteristics
Criado et al, 2020 [4]	MeSH (Medical Subject Headings) in PubMed	Articles containing information on COVID-19 and the skin.
Wollina 2020 [5]	Review with a focus on COVID-19 in dermatology	Suspected infectious patients, protection of medical doctors and nurses
Sachdeva et al, 2020 [6]	Overview of various cutaneous manifestations in patients with COVID-19 through three case reports and a literature review	A literature search was conducted using PubMed, OVID, and Google search engines for original and review articles.
Elmas et al, 2020 [7]	A review with a focus on the reported cutaneous manifestations of COVID-19	Different types of cutaneous manifestations including urticarial, maculopapular, papulovesicular, purpuric, livedoid, and thrombotic ischemic lesions were been reported,
Wollina et al, 2020 [8]	Describe cutaneous symptoms of patients of all ages in association with COVID-19	Disorders that are caused by direct action of SARS-CoV-2 on tissues, complement, and coagulation system and on nonspecific eruption of the systemic viral infection

**Table 1:** The target public and their characteristics as described in the articles researched.

Article	Methods	Results
Criado et al, 2020 [4]	Searched for articles containing information on COVID-19 and the skin.	The pathophysiology of the disease is multifactorial: association with innate immune response, hypercoagulability state, lung tissue damage, neurological and/or gastrointestinal tract involvement, monocytic/macrophage activation syndrome, culminating in exaggerated cytokine secretion, called “cytokine storm”, which leads to worsening and death. These systemic conditions may be associated with cutaneous lesions, may be associated with multisystemic manifestations that could occur due to angiotensin-converting enzyme 2 receptor and transmembrane serine protease action, allowing the pulmonary infection and possibly skin manifestation.
Wollina 2020 [5]	Discuss the available data on cutaneous symptoms, although disease-specific symptoms have yet not been observed. COVID-19 is a challenge for the treatment of dermatologic patients, either with severe inflammatory disorders or with skin cancer.	The consequences for systemic treatment are obvious but it will be most important to collect the clinical data for a better decision process. Last but not least, education in dermatology for students will not be temporarily possible in the classical settings.
Sachdeva et al, 2020 [6]	A literature search was conducted using PubMed, OVID, and Google search engines for original and review articles. Studies written in the English language that mentioned cutaneous symptoms and COVID-19 were included	Eighteen articles and three additional cases reported in this paper were included in this review. Of these studies, 6 are case series and 12 are case report studies. The most common cutaneous manifestation of COVID-19 was found to be maculopapular exanthem (morbilliform), presenting in 36.1% (26/72) patients. The other cutaneous manifestations included: a papulovesicular rash (34.7%, 25/72), urticaria (9.7%, 7/72), painful acral red purple papules (15.3%, 11/72) of patients, livedo reticularis lesions (2.8%, 2/72) and petechiae (1.4%, 1/72). Majority of lesions were localized on the trunk (66.7%, 50/72), however, 19.4% (14/72) of patients experienced cutaneous manifestations in the hands and feet. Skin lesion development occurred before the onset of respiratory symptoms or COVID-19 diagnosis in 12.5% (9/72) of the patients, and lesions spontaneously healed in all patients within 10 days. Majority of the studies reported no correlation between COVID-19 severity and skin lesions
Elmas et al, 2020 [7]	A review with a focus on the reported cutaneous manifestations of COVID-19.	The infection has been reported to demonstrate different types of cutaneous manifestations including urticarial, maculopapular, papulovesicular, purpuric, livedoid, and thromboticischemic lesions.
Wollina et al, 2020 [8]	Describe cutaneous symptoms of patients of all ages in association with COVID-19	We will focus on such disorders that are caused by direct action of SARS-CoV-2 on tissues, complement, and coagulation system and on nonspecific eruption of the systemic viral infection. Drug-induced reactions are only mentioned in the differential diagnoses.

**Table 2:** The principal methodology and results as described in the articles researched.

Article	Conclusion
Criado et al, 2020 [4]	This review describes the complexity of Covid-19, pathophysiological and clinical aspects, dermatological finding and other dermatological conditions associated with SARS-CoV-2 infection or COVID-19.
Wollina 2020 [5]	COVID-19, although not a skin disease, by itself has an immense impact on dermatology.
Sachdeva et al, 2020 [6]	Infection with COVID-19 may result in dermatological manifestations with various clinical presentations, which may aid in the timely diagnosis of this infection.
Elmas et al, 2020 [7]	Given the high mortality rate of the infection, timely and accurate identification of relevant cutaneous manifestations may play a key role in the early diagnosis and management.
Wollina et al, 2020 [8]	Knowledge of the cutaneous manifestations of COVID-19 may help in early diagnosis, triage of patients, and risk stratification.

**Table 3:** The conclusions founded in the articles researched.

## Discussion

Criado and his collaborators written that several viral infections are associated to promoting innate and adaptive human immune responses [4]. The activation of some immunological cells by direct and/or indirect viral effects is possible and it is important to alert skin manifestations as well as urticarial, eczematous dermatitis, or the exacerbation of these conditions, rashes, neutrophilic dermatoses and hypercoagulable states as acral ischemia. Seeing cutaneous manifestations, some aspects of COVID-19 infection could be caused by cytopathic effects on the dermis vessels or even stimulated by cytokines in small vessels. The photography and anatomopathological studies are critical for the diagnosis and for establishing differential diagnosis with other cutaneous or systemic events, which may or may not be temporality and random related to COVID-19 or be casual events. In their work, Darlenski and Tsankov, et al. confirm the fact that the skin and COVID-18 interactions [9], as well as the consequences to the skin and mucous membranes of increased personal hygiene cares. The use of precautionary measures as emollients, barrier creams, is essential in preventing skin lesions complicated by first preventive steps taken during the pandemic.

Wollina, et al. written that dermatologists are vital in protective measures of the health care staff and in the differential analysis of widespread skin lesions [5]. They need to give information for patients and clinicians about the skin involvement with severe inflammatory skin disease and also general drug therapy. Guarneri, et al. and collaborators noticed about three young patients showing with chilblain like lesions who were diagnosed with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections [3]. Two were asymptomatic and possibly contagious. Lesions such as erythematous rashes, urticarial, and chicken pox-like vesicles, were founded in 18 of 88 patients with COVID-19 in other study. These symptoms advanced to SARS-CoV-2 infection. In these cases, lesions involved the acral sites, especially the dorsum of the digits of the feet, beginning as erythematous violaceous patches that gradually evolved to purpuric lesions and then to blisters and ulcerous-necrotic lesions, with final complete return to normal. Burning and itching were also present with some of the lesions.

For Sadsheva, et al. and collaborators [6], although there were several limitations that must be considered to literature review about dermatology and coronavirus, as well as, the limitation of the sample size used, dermatologists are describing skin lesions all over the world and helping to draw strong conclusion applicable to whole populations. They examined 72 cases of COVID-19 related cutaneous pathologies. Besides they take an account the possibility of dermatologic side effects experience from medications used by participants, the evidence suggested that COVID-19 could have dermatological manifestations. Lee, et al. had the point of view that the research for the dermatological society in terms of COVID-19 may include the potential entry niche of COVID-19 into the integumentary system [10], how and what condition the disinfectants could kill the virus in the environments, and how the virus propagates in the skin and other organs, as well as, how to evade the defences of host immune system. In the COVID-19 era, dermatologists not only should contribute their knowledge and professional ability in healthcare but also takes the opportunities to learn about the pathogenesis and apply it into healthcare.

Elmas, et al. and collaborators besides the limited number of studies available about COVID-19 [7], the disease has been reported to be associated with different types of cutaneous manifestations (urticarial, maculopapular, papule vesicular, purpuric, livedoid, thrombotic ischemic lesions) evaluated in patients with the disease. Given the high mortality rate of this infection, timely and accurate identification of the relevant cutaneous manifestations may play a key role in the early diagnosis and management. In the work of Kannan, et al. this epidemic disease has a convincing mode of transmission that is via inhalation of infectious aerosols [11]. The incubation period is just between 3 to 14 days. The virus may cause disease ranging from asymptomatic to fatal disease. In elderly patients, the virus infects the lower respiratory tract causing fatal pneumonia. Other non-specific symptoms include fever, cough, and myalgia, dyspnea with or without diarrhea. In the second week of infection, it progresses to hypoxemia, difficulty in breathing and Acute Respiratory Distress Syndrome (ARDS), at this stage patient may require mechanical ventilation in Intensive Care Unit with quarantine facilities. No stage of cutaneous manifestations was related. This present symptoms in skin will be a direction to diagnose the manifestation of the disease and help to take the first approach. Wollina, et al. showed that cutaneous manifestations of COVID-19 pandemic gain increasing attention since they might be useful in early diagnosis triage of positive patients and their risk stratification [9]. Children and young adult patients who are either asymptomatic or develop a mild disease, have been associated with chilblain-like acral eruptions and purpuric and erythema multiform like lesions. In other adult patients who run a more severe course, they have been presented acro-ischemic lesion and maculopapular rash. Urticarial with pyrexia has diagnostic significance since this combination is an early symptom of an otherwise not confirmed SARS-CoV-2 infection.

The new coronavirus, like so many other viruses, is showing a polymorphic clinical picture and is prone to ischemic symptoms in the most severe cases. It is challenging to dermatologists, who are attentive in order to help the scientific world through what we see on the skin. The next weeks, months, years, will change the way of doing things, and frightened patients may have contributed to these changes, producing some effects that are without precedent [12].

In a recent work Galvan Casa, et al. classified the lesions with the percent of occurrence as acral areas of erythema with vesicles or pustules, other vesicular eruptions [13], urticarial lesions, maculopapular eruptions and livedo or necrosis. The pustules (pseudo-chilblain) was a pattern that frequently appears late in the evolution of the COVID-19. The severity of this disease shows a gradient from less severe disease in acral lesions to more severe in the latter groups with cutaneous necrosis. The authors hope that the description of the cutaneous manifestation associated with COVID-19 infection may help clinicians approach patients with the disease and recognize cases presenting with few symptoms.

## Conclusion

Although several cutaneous manifestations had been associated with COVID-19, none so far is specific to this disease. The dermatological approach has been valued and, in the future, It is expected that dermatologists can help both in the early diagnosis of the disease and in its prognosis.

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