The spectrum of COVID-19-associated dermatologic manifestations:

an international registry of 716 patients from 31 countries

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Ethics: The registry was reviewed by the Partners Healthcare (MGH) Institutional Review Board (IRB) and was determined to not meet the definition of Human Subjects Research.

Key Points

Question: What are the cutaneous manifestations associated with COVID-19 and do they provide insight into the pathophysiology or prognosis?

Findings: In this international registry-based case series of 716 patients representing 31 countries, the most common dermatologic morphologies encountered in the 171 COVID-19 confirmed case included morbilliform, pernio-like, urticarial, macular erythema, vesicular, papulosquamous, and retiform purpura. Retiform purpura was seen exclusively in critically ill, hospitalized patients.

Meaning: COVID-19 is associated with a spectrum of skin findings in affected patients. These cutaneous manifestations may vary depending on the severity of COVID-19.

Background: Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has associated cutaneous manifestations.[1] Case series have thus far documented lesions that are pernio-like,[2-6] erythematous macules or papules,[5-7] urticarial,[7,8] morbilliform,[8] varicelliform,[5-9] and papulosquamous.[10] Petechial eruptions,[8,11] livedo reticularis-like rashes,[5,8] purpuric lesions,[5] and acro-ischemic lesions[12] and retiform purpura[13] have been reported less frequently. The timing of these varied eruptions in the disease course remains unclear, as do any potential associations between morphological subtypes with different COVID-19-associated syndromes, disease courses, and/or outcomes.

Methods: In collaboration with the American Academy of Dermatology (AAD) and International League of Dermatologic Societies (ILDS), we established an international registry to collect cases of COVID-19 with cutaneous associations (www.aad.org/covidregistry); the registry is open to medical professionals only. No protected health information was collected, and all data was de-identified. The registry collected information on COVID-19 diagnosis type (suspected vs laboratory-confirmed), patient demographics, comorbidities, details regarding the patients' new onset dermatologic condition, timing of dermatologic condition onset, information from skin biopsy reports when available, COVID-19 symptoms, and outcomes, including hospitalization, oxygen requirements, ventilator requirements, and deaths. All suspected or laboratory-confirmed COVID-19 cases, with new onset dermatologic findings, were eligible for inclusion in initial analysis. A sub-group analysis was performed restricted to lab-confirmed cases.

Results: The registry collected 716 cases of new-onset dermatologic symptoms in patients with suspected or confirmed COVID-19 from April 8 to May 17, 2020. Cases came from 31 countries with most (89%) from the United States. Dermatologists entered most of the cases (54%). Median patient age was 30 years (IQR 19-49). Of the 171 patients in the registry with laboratory-confirmed COVID-19, the most common cutaneous morphologies, in order of frequency, were morbilliform, pernio-like, urticarial, macular erythema, vesicular, papulosquamous, and retiform purpura. In general, lesions tended to occur after (64%) or concurrently (15%) with other COVID-19 symptoms. Retiform purpura appeared in patients with the most severe disease course, presenting exclusively in very ill, hospitalized patients. Skin biopsies were reviewed for 15 patients.

Conclusions and Relevance: This study highlights the array of cutaneous manifestations associated with COVID-19 diagnoses. Many morphologies were non-specific, while others may allow insight into potential immune or inflammatory pathways in COVID-19 pathophysiology. These cutaneous manifestations may vary depending on the severity of COVID-19, with retiform purpura exclusively reported in hospitalized patients.

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