Dermatology and COVID-19

Even early in the coronavirus disease 2019 (COVID-19) pandemic, it was clear that dermatologists had an important role in the management of patients. Although initial case series rarely documented skin changes, possibly due to the inability to perform a complete skin examination, subsequent research has suggested significantly higher rates of skin involvement.1 The true prevalence of skin findings, the uncertainty of whether these represented direct infection or were associated with systemic illness (eg, reactive or due to medications), and how best to manage them were among the many questions challenging the evolving understanding of these cutaneous manifestations. This has been an important opportunity for dermatologists to learn and contribute.2 What are the current priorities in dermatology research and clinical care as the COVID-19 pandemic progresses?

Skin Findings

A broad spectrum of skin manifestations has been reported in association with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, spanning almost every inflammatory pattern. The variability of skin findings seen is substantial compared with other viral infections that typically present with characteristic skin patterns. The seemingly high (estimated as high as 20% in one study) prevalence in adults, who rarely present with viral exanthems, is also notable. Understanding the true prevalence of skin findings is complicated by the lack of testing, as well as likely reporting bias in publication. SARS-CoV-2 infection disproportionately affects people of color yet there have been almost no reports of dermatologic findings in this population.3

The largest case series of skin manifestations to date, which included 375 patients, highlighted 5 predominant morphological patterns: maculopapular, urticarial, pseudochilblain, vesicular, and livedoid.1 The ability to characterize and categorize skin changes into morphological patterns will help inform hypotheses and subsequent studies on the mechanisms involved. For example, livedoid changes signify occlusion of the cutaneous vessels, and studies in patients with COVID-19 and livedoid changes have pointed to likely complement-mediated vasculopathy4 that may portend systemic thrombosis. Dermatologists also may be important in the diagnosis and understanding of pediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 infection (also known as multisystem inflammatory syndrome in children) because half the children affected with this syndrome present with characteristic mucocutaneous findings, and to clarify its cutaneous distinctions from Kawasaki disease.5

In addition, the worldwide recognition of acral chilblainslike lesions (also known as COVID-19 toes) has generated both confusion and controversy among dermatologists.6 The finding of chilblainslike lesions in multiple case series of patients with documented COVID-19, along with early reports of ultrastructural detection of SARS-CoV-2 infection and strong type I interferon signal in these skin lesions, suggest a pathophysiological relationship beyond just temporal association. However, other large case series of patients presenting with this skin finding have failed to find SARS-CoV-2 infection by either nasopharyngeal swab or serological tests.6 Could chilblainslike lesions, which tend to affect younger, asymptomatic patients often late in the evolution of COVID-19 disease, be a late-phase immune response or be associated with failure to trigger humoral immunity?1 Studies have been limited by uncertain case definition because chilblains affects a similar demographic and may be associated with other viral or systemic illnesses.

Key Considerations for the Study and Management of Dermatology Patients

COVID-19 has raised many important questions about the current management of patients with cutaneous disease. In the earliest days of the pandemic, many expert guidelines were generated on how best to manage patients receiving systemic immunosuppressive therapy indicated for skin disease, such as corticosteroids and biologic agents. Multiple registries worldwide were created to capture data on clinical outcomes in patients with specific skin conditions. Whether these patients have increased susceptibility to SARS-CoV-2 infection or different outcomes compared with the general population is a critical question. Broader databases will be needed to determine the relative rates of infection and mortality in patients with immunosuppression from therapies for skin disease because these may differ from patients undergoing immune suppression for other indications. Designing research collaborations and systems for rapid implementation of research across different health systems to study the skin findings in COVID-19 infection is another important opportunity for dermatologists.

Whether all patients with COVID-19 skin manifestations need expert dermatologic care has been debated, especially in the cases of likely nonspecific skin reactions such as morbilliform eruptions or urticaria seen in
association with SARS-CoV-2 infection. During the initial days of the pandemic, the presentation of otherwise healthy and asymptomatic patients (largely over telemedicine platforms) for evaluation of acral chilblainlike lesions raised a clinical dilemma of whether to bring patients into the clinic for SARS-CoV-2 testing. A wealth of information has been gained from the study of these patients, including results of hematologic and rheumatologic testing. However, it is important to acknowledge that these evaluations represent research and are not yet established as the clinical standard of care.

COVID-19 and the Dermatology Workforce and Education

COVID-19 has changed the workforce and the way dermatologists practice and learn. Reassignment of dermatologists occurred worldwide, most often to COVID-19 screening facilities and to inpatient hospital wards. Valid institutional restrictions on nonessential in-person specialty care and elective procedures, shortages of personal protective equipment, and the need for dermatology clinics to provide ongoing access had many dermatologists turning to telemedicine. Important opportunities were afforded by key changes to regulations from the Centers for Medicare & Medicaid Services in March 2020, including widespread implementation of teledermatology platforms in academic dermatology departments, changes to the iPledge system for isotretinoin prescribing that align well with telemedicine,7 and the possibility of furthering the outreach of dermatologic care.

However, key questions remain. Do virtual visits provide high-quality dermatologic care equivalent to in-person visits? Are the patients seen via telemedicine the same patients who are the highest priority in needing dermatologic care? Could disparities in access to dermatologists be exacerbated by live video telemedicine that requires high-bandwidth internet and privacy to execute? The effect of delayed dermatologic care (eg, delayed detection of skin cancer or diagnosis of inflammatory disease) resulting from closed clinics or patients choosing not to seek in-person care must also be studied. It is paramount that dermatologists find evidence-based, equitable, and sustainable solutions to safely and effectively deliver expert care during this pandemic and in the days ahead.

Disruption of education at all levels is another notable effect on the dermatology workforce. Almost every dermatology residency program sustained significant disruptions in patient care-based and procedural education over the past few months, which in some cases was due to the redeployment of resident physicians. It will be important to consider how to provide support for trainees and also course correction for residency curricula. Safely reintroducing learners into the clinical environment has required tremendous effort by dermatology educators and clinical chiefs, and there is an ever-changing landscape as upticks in SARS-CoV-2 infections occur across the country.

Another educational problem of utmost importance is the upcoming residency recruitment season, which will be almost exclusively virtual. This change in the resident selection process will force residency and fellowship program directors and other faculty to reflect on what core values are desirable and necessary in the next generation of dermatologists and to ensure that these core values are maintained at the forefront of recruitment. It is paramount to pay particular attention to the proactive mentorship and recruitment of underrepresented minority students into dermatology.

Looking to the Future: Opportunities for Dermatology

It has been an extraordinary time for medical publishing with an unprecedented rapid publication pace of articles related to SARS-CoV-2 infection. With notable exception, the dermatology COVID-19 literature is comprised mostly of case reports, small case series, and opinion articles. It will be important for dermatologists to pursue rigorous prospective research to achieve a comprehensive understanding of the true prevalence and natural history of SARS-CoV-2 infection and skin findings, determine whether cutaneous manifestations signal important systemic associations, and identify the best management strategies. In addition, parallel research efforts should address how dermatologists can best continue to provide expert care in the time of a global pandemic, with careful attention to strategies that minimize furthering disparities in access, and possibly identifying opportunities to clarify priorities in dermatologic research and clinical care.

Dermatologists should remain focused on their important role in the midst of this international health care crisis, continue to learn and contribute, and consider how they can best diagnose and safely and effectively treat patients with COVID-19–related skin manifestations while retaining the highest quality for all patients who require dermatologic care. Rigorous research, careful self-reflection, and strengthened commitment to core values in dermatology and the relevance as a specialty are now more important than ever.

### References