Hospital Dermatology: Review of Research in 2022-2023

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PRACTICE **POINTS**

- A severe hypersensitivity reaction to trimethoprim-sulfamethoxazole—sudden conjunctivitis, lymphopenia, sunburnlike rash, and hemodynamic changes (SCoRCH)—has been described.
- Patients experiencing cutaneous reactions to immune checkpoint inhibitors have improved progression-free and overall survival rates if evaluated by a dermatologist who can optimize skin-directed and targeted therapies.
- Interventions, including shorter time to dermatology outpatient follow-up, are needed to reduce emergency department utilization by patients with hidradenitis suppurativa.
- Asynchronous store-and-forward dermatology e-consultation is effective for immunobullous diseases, vasculitis, herpes zoster, and cellulitis, demonstrating the utility of teledermatology in the inpatient setting, particularly when standardized data capture tools are used.

In the inpatient setting, dermatology consultants help reduce mortality, shorten length of stay, and reduce hospital readmissions. Recent research underscores the contributions of dermatology hospitalists, including phenotyping known and new severe cutaneous adverse drug reactions; showing improved progression-free and overall survival among those receiving dermatologic care for cutaneous reactions to immune checkpoint inhibitors; highlighting the role of dermatologists in reducing emergency department and hospital utilization by those with inflammatory skin diseases; and demonstrating ways in which dermatologists can effectively diagnose common and severe cutaneous diseases using asynchronous teledermatology, meeting the growing demand for inpatient dermatology services. This review covers selected highlights from the 2022-2023 inpatient dermatology literature.

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Dermatologists improve the diagnostic accuracy and quality of care of patients in the hospital setting. They help shorten the length of stay, improve outpatient follow-up, and reduce the rate of hospital readmission.[1] Medicare beneficiaries hospitalized with skin conditions at institutions with a dermatology hospitalist—a provider with a specialty interest in inpatient dermatology—have 24% lower odds of risk-adjusted 30-day mortality and 12% lower odds of risk-adjusted 30-day readmissions.[2]

In the last year, research among the dermatology hospitalist community has actively contributed to our understanding of challenging inpatient skin diseases and has identified new ways in which dermatologists can contribute to the care of hospitalized patients. In this review, we highlight 4 areas of focus from the published literature in 2022-2023—severe cutaneous adverse reactions, supportive oncodermatology, cost of inpatient services, and teledermatology.

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Severe Cutaneous Adverse Reactions: Old and New

Severe cutaneous adverse reactions to medications frequently are encountered in the inpatient setting. Dermatology hospitalists are well positioned to phenotype these reactions, drawing insights that aid in identifying, characterizing, risk stratifying, and managing these conditions, which have considerable morbidity and mortality.

A recent 20-year retrospective review of cases of acute generalized exanthematous pustulosis (N=340) across 10 academic systems—the largest to date—improves our understanding of the features of this rare entity.[3] The authors found that acute generalized exanthematous pustulosis most often is triggered by β-lactam and other antibiotics (75.5%) and is accompanied by fever (49.7%), neutrophilia (85.1%), and eosinophilia (52.1%). Kidney and liver involvement occur in less than 10% of cases, and mortality rates are low but not zero, with an all-cause 30-day mortality rate of 3.5%.[3]

In a multi-institutional retrospective study of 68 patients diagnosed with DRESS (drug reaction with eosinophilia and systemic symptoms) syndrome, Sharma et al[4] developed a scoring system to identify those at greatest risk for DRESS recurrence. Variables associated with recurrence including younger age, female sex, and features considered atypical for DRESS syndrome—nonmorbilliform rash; absence of facial edema; antinuclear antibody positivity; medication class other than antibiotic, antigout, or antiseizure—were used to develop a "ReDRESS" score. This predictive model had a sensitivity of 73% and specificity of 83% for predicting DRESS recurrence.[4]

Another case series characterized SCoRCH (sudden conjunctivitis, lymphopenia, sunburnlike rash, and hemodynamic changes), a newly described hypersensitivity reaction to trimethoprim-sulfamethoxazole.[5] The onset of this reaction typically occurs 4 to 11 days after initiation of trimethoprim-sulfamethoxazole but can occur as quickly as 1 day following re-exposure. Patients are systemically ill with fever, hypotension, tachycardia, acute renal insufficiency, and transaminitis, and they have a diffuse sunburnlike erythema without scale, facial edema, and conjunctivitis. It is thought this distinct hypersensitivity reaction may be mediated by IL-6, which has a role in triggering a sepsislike physiology, with vasodilation, hypotension, and edema.[5]

A systematic review and meta-analysis found that sulfonamides remain the most prominent cause of Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN).[6] A case-control study described SJS/TEN presentations triggered by *Mycoplasma*, advocating for routine *Mycoplasma* screening, especially in patients without a clear medication culprit. *Mycoplasma*-induced cases carried statistically lower rates of mortality (0%) compared with medication-induced cases (22.5%).[7] Another prospective open-label study evaluated SJS/TEN management by randomizing 25 patients to receive either combination therapy with methylprednisolone plus a tumor necrosis factor α inhibitor or methylprednisolone alone.[8] Anti–tumor necrosis factor therapy was associated with a shorter length of initial steroid treatment and duration of the acute stage, hospitalization, and time to re-epithelialization[8]; however, as in a prior randomized unblinded trial,[9] there was no difference in mortality between the 2 groups.

There is limited high-quality evidence to support the use of any systemic immunomodulator to decrease SJS/TEN–related mortality.[10] A Cochrane systematic review highlighted the many limitations of the available data due to variations in presentation, assessment, and management.[11] Because SJS/TEN is rare, powering studies based on mortality is infeasible; the authors calculated that 2872 participants were needed to detect a 50% mortality reduction among those with SCORTEN (severity-of-illness score for TEN) scores of 0 to 1.[11] Therefore, collaborative efforts using appropriate outcomes measures (eg, time to re-epithelialization, length of hospital stay), standardized terminology and dosing regimens, and adaptive trial designs are needed. Consensus-derived assessment and treatment protocols could help account for variation, ensure consistency in treatment, and enable head-to-head comparisons. Members of the Society of Dermatology Hospitalists are working on efforts to standardize terminology and validate outcomes measures needed for future studies.[12]

Supportive Oncodermatology: A New Frontier

With the advent of immune checkpoint inhibitors (ICIs) for a growing number of cancers, dermatologists have become critical to identifying and managing cutaneous immune-related adverse events (cirAEs). Recent findings have demonstrated that dermatology input improves patient outcomes, not only regarding the treatment of dermatoses but also by augmenting cancer-related survival. One group found that patients with cirAEs who were evaluated by a dermatologist had improved progression-free (hazard ratio, 0.69; 95% CI, 0.54-0.87; P=.002) and overall survival rates (hazard ratio, 0.62; 95% CI, 0.45-0.84; P=.002), controlling for cirAE severity, age, sex, cancer type, and ICI subtype. Patients who were under the care of a dermatologist also were more likely to resume ICI therapy following an interruption (odds ratio, 10.52; 95% CI, 5.15-21.48; P<.001).[13] Dermatologists help to optimize skin-directed and targeted therapies, such as dupilumab, minimizing exposure to systemic immunosuppression in these complex patients.[14]

Supportive oncodermatologists also have made important observations on how cirAEs relate to other adverse events and prognosis. A review of 628 patients found that almost half of those with cirAEs had co-occurring noncutaneous immune-related adverse events, most commonly pulmonary. Psoriasiform eruptions were most frequently

associated with noncutaneous immune-related adverse events, and cutaneous reactions frequently preceded the development of systemic manifestations, serving as a clinical biomarker to provide prognostic information.[15] A review of 95 patients found that spongiotic and lichenoid interface reactions were associated with decreased mortality rates, whereas vacuolar interface and perivascular dermatitis were associated with increased mortality.[16]

As with severe cutaneous adverse events, dermatology input has been critical for accurately phenotyping and risk stratifying these novel reactions. The dermatologist's skill set is necessary for optimizing skin-directed and targeted therapies while minimizing systemic immunosuppression, thereby improving patient outcomes with respect to rash, cancer response, and survival.

The Cost of Inpatient Skin Disease

Hospitalizations account for approximately half of all health care expenditures, and hospital readmission, seen as a measure of the quality of health care delivery, can double this cost.[17] Identifying and developing protocols for addressing patients with complex chronic inflammatory disorders is one strategy for improving outcomes and reducing financial burden. Inpatient dermatologists have identified hidradenitis suppurativa as one disease that can benefit from early intervention by dermatologists in the hospital, with its 30-day (17.8%) and 180-day (48.6%) readmission rates being comparable to those of heart failure.[18]

Following an index emergency department (ED) visit, 17.2% (3484/20,269) of patients with HS have at least 1 return ED visit within 30 days, while only 2.4% (483/20,269) have a dermatology visit within the same time frame.[19] Understanding the risk factors for hospital readmission and ED utilization, including severity of illness, the presence of medical comorbidities, health coverage under Medicaid, and receipt of opioids, can allow dermatologists to anticipate those at greatest risk.[19] Opportunities exist for cross-specialty interventions to anticipate and address modifiable risk factors. Shorter time to dermatology outpatient follow-up leads to improved clinic attendance and may help reduce ED utilization and hospital readmission.[20]

Teledermatology: Leveraging Inpatient Expertise

Although the benefit of inpatient dermatologic care is substantial, access to that care is finite. Following the COVID-19 pandemic, there is an increased acceptance of telemedicine and the long-term role it can play in leveraging dermatologic expertise, including meeting the increasing demand for inpatient dermatology care in rural and resource-poor communities.[21]

Recent studies conducted by dermatology hospitalists have illustrated the value of asynchronous store-and-forward technology in settings lacking access to consultative dermatology.[22,23] Stephens et al[22] found that expanding provider-to-provider electronic consultation (e-consultation) capacity to an inpatient rehabilitation facility resulted in completed consultations within 1.5 days compared with a 7- to 14-day wait time for patients attending an in-person urgent access dermatology clinic. In another study, the implementation of asynchronous dermatology e-consultations for immunobullous diseases, vasculitis, and herpes zoster resulted in a change in diagnosis 86% of the time, accompanied by at least 1 new systemic or topical therapy recommendation.[23]

Researchers also identified ways in which teledermatology can be inelegant and proposed specific supplemental data to aid in diagnosis. A review of 126 inpatient e-consultations demonstrated limitations related to the diagnosis of skin and soft-tissue infections. In two-thirds to three-quarters of cases, potentially useful descriptive information was missing, and in 70% (88/126), images were not appropriately focused. The authors developed a detailed checklist to help primary medical teams focus their differential diagnoses.[24] A recent pilot study found that supplementation of clinical information with a standardized questionnaire and thermal images improved the accuracy of cellulitis diagnosis. Using this method, there was no difference in accuracy between dermatology hospitalists and other board-certified dermatologists, supporting the notion that any dermatologist can fulfill this need successfully, even without specific inpatient experience.[25] Due to the high incidence and cost of cellulitis and related hospital admissions,[26] such an intervention could have a considerable financial and patient safety impact.

Final Thoughts

This last year brought many changes to the health care landscape, the recession of a global pandemic, and an increasingly complex health care delivery system. Inpatient dermatologists met these challenges by providing high-quality dermatologic care and practice-modifying research in the areas of severe cutaneous adverse reactions, supportive oncodermatology, hospital readmission, telemedicine, and more, demonstrating the value of dermatologic expertise in the hospital setting.

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