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EDITORIAL

Limitations of Firewalls in Medical Societies: What is the Validity of Firewalls if the Same Individuals Are, Will Be, or Wish to Be on Both Sides of the Firewalls?

Lambert, Gaspari, Alhatem, and Parish

COMMENTARY

Commentary on "Garg KS, Tjahjono L. Successful Treatment of Recalcitrant 5-Fluorouracil-Induced Irritant Dermatitis with Roflumilast 0.3% Cream"

Lambert, and Lambert

REVIEW

Lipophagic/Lipoatrophic Panniculitis: An update on clinicopathologic features, pathogenesis, and management

Saade, Ghaoui, Hawa, Khoury, Kurban, and Abbas

ORIGINAL CONTRIBUTIONS

Solid Nodules after Poly-L-Lactic Acid Injection: A study of 90 Patients
Cavallieri, Harada, Balassiano, Barakat, Munhoz, Ramos-e-Silva, Brazilian Study Group on Dermatologic Procedures and their Complications (BSGDPC)

Validation of Natural Oils for Hair Loss Treatment as Promoted by TikTok Users

Banh, Iurillo, Loczi-Storm, Hoffman, Monroe, Diebl, Abrantes, Caddali, Cantu, Barber, and Wisco

Prevalence of Androgenetic alopecia in male population of Kashmir Valley: A Hospital-based study from North India

Yaseen, Reyaz, Bhat, and Tak

Acute Generalized Exanthematous Pustulosis: A Study of 20 Patients
Zaouak, Mrad, Jouini, Chamli, Charfi, Hammami, and Fenniche

DEPARTMENTS

PHOTO CAPSULE

Purpura Fulminans and Symmetric Peripheral Gangrene
Srivastava, and Choudhary

PERILS OF DERMATOPATHOLOGY

The Importance of Knowing Basic Biology in Making Critical Diagnoses II: Nuances of Infectious and Infesting Organisms—New Observations

Maddukuri, Karanfilian, Lambert, Elias, Bebbani, Alhatem, and Lambert

NEW THERAPY UPDATES

SOFDRA (Sofpironium) Topical Gel, 12.45%, for the Treatment of Primary Axillary Hyperhidrosis

Gupta, Mann, Vincent, and Abramovits

SIRTURO® (Bedaquiline) for Oral Use in Pulmonary Tuberculosis (TB) due to Multi-Drug Resistant (MDR) *Mycobacterium tuberculosis*

Gupta, Mann, Vincent, and Abramovits

CASE STUDIES

Effective Management of Refractory Brunsting—Perry Cicatricial Pemphigoid with Dupilumab

Alam, Alameddine, Shalabi, and Haley

Successful Treatment of Recalcitrant 5-Fluorouracil-Induced Irritant Dermatitis with Roflumilast 0.3% Cream

Garg, and Tjahjono

CORRESPONDENCE

Isolated Involvement of Umbilicus: A Rarity of Inverse Psoriasis

Bansal, and Sushama

Real-Life Experience with Dupilumab in Moderate-to-Severe Atopic Dermatitis in Children Aged Less than 6 years: A Case Series

Amoedo, Rosa, Nogueira, Cruz, and Mota

Striae, an Immunocompromised Region, Resulting in Koebnerization of Lichen Planus

Dev, and Bansal

Sentiment Analysis of Hirsutism Treatments on Twitter

Xu, and Ross

Housewife's Hand Dermatitis and Pregnancy: Incidence of Atopic Diathesis

Horiuchi

Sun Exposure in Paradise: Assessment of Sunscreen Use, Tanning, and Sunburning Behaviors in *Bachelor in Paradise* (Season 1 versus Season 8)

Xu, Krain, and Ross

BOOK REVIEW

Procedures in Cosmetic Dermatology: Soft Tissue Augmentation 5th Edition

Saira Agarwala

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EDITORIAL

- Limitations of Firewalls in Medical Societies: What is the Validity of Firewalls if the Same Individuals Are, Will Be, or Wish to Be on Both Sides of the Firewalls?** 349
W. Clark Lambert, MD, PhD, FRCP (Edin.); Anthony Gaspari, MD; Albert Alhatem, MD; Lawrence Charles Parish, MD, MD (Hon.), FRCP (Edin.)

COMMENTARY

- Commentary on "Garg KS, Tjahjono L. Successful Treatment of Recalcitrant 5-Fluorouracil-Induced Irritant Dermatitis with Roflumilast 0.3% Cream"** 351
W. Clark Lambert, MD, PhD, FRCP (Edinburgh); Muriel W. Lambert, PhD

REVIEW

- Lipophagic/Lipoatrophic Panniculitis: An update on clinicopathologic features, pathogenesis, and management** 354
Serena Saade, MD; Nobra Ghaoui, MD; Mariana El Hawa, MD; Dana-Maria Khoury, MD; Mazen Kurban, MD; Ossama Abbas, MD

ORIGINAL CONTRIBUTIONS

- Solid Nodules after Poly-L-Lactic Acid Injection: A study of 90 Patients** 369
Fernanda A. Cavallieri, MD; Patricia Harada; Laila Klotz de Almeida Balassiano, MD; Natalia Baracat; Gabriela Munhoz, MD; Marcia Ramos-e-Silva, MD, PhD; Brazilian Study Group on Dermatologic Procedures and their Complications (BSGDPC)
- Validation of Natural Oils for Hair Loss Treatment as Promoted by TikTok Users** 373
Marian Banb, BA; Alyssa Iurillo, BA; Angela Loczi-Storm, BS; Victoria Hoffman, MS; John Monroe, BS; Kyra Diehl, BS; Tatiana Abrantes, MD; Christian Caddali, BS; Monique Cantu, BS; Cara Barber, MD, MPH; Oliver Wisco, DO
- Prevalence of Androgenetic alopecia in male population of Kashmir Valley: A Hospital-based study from North India** 380
Ummer Yaseen, MBBS MD; Saika Reyaz, MBBS MD; Shabir Ahmad Bhat, MBBS, MD; Fayaz Ahmad Tak, MBBS MD
- Acute Generalized Exanthematous Pustulosis: A Study of 20 Patients** 385
Anissa Zaouak, MD, PhD; Malek Mrad, MD; Raja Jouini, MD; Amal Chamli, MD; Ons Charfi, MD; Houda Hammami, MD; Samy Fenniche, MD

DEPARTMENTS

PHOTO CAPSULE

Snejina Vassileva, MD, PhD, Section Editor

- Purpura Fulminans and Symmetric Peripheral Gangrene** 389
Ankita Srivastava, MD; Sanjiv Choudhary, PhD

PERILS OF DERMATOPATHOLOGY

W. Clark Lambert, MD, PhD, Section Editor

- The Importance of Knowing Basic Biology in Making Critical Diagnoses II: Nuances of Infectious and Infesting Organisms— New Observations** 391
Spandana Maddukuri, BS; Katrice M. Karanfilian, BS; Muriel W. Lambert, PhD; Marcus L. Elias, BS; Sara Bebbahani, MS; Albert Alhatem, MD; W. Clark Lambert, MD, PhD

NEW THERAPY UPDATES

William Abramovits, MD; Aditya K. Gupta, MD, PhD, FRCPC, Section Editors

SOFDRA (Sofpironium) Topical Gel, 12.45%, for the Treatment of Primary Axillary Hyperhidrosis..... 396

Aditya K. Gupta, MD, PhD; Avantika Mann, PhD; Kimberly Vincent, MD; William Abramovits, MD, SOFDRA (sofpironium) topical gel, SOFDRA is the trademark of Botanix SB Inc., Initial US Approval: 2024

SIRTURO® (Bedaquiline) for Oral Use in Pulmonary Tuberculosis (TB) due to Multi-Drug Resistant (MDR) *Mycobacterium tuberculosis*..... 399

Aditya K. Gupta, MD, PhD, FRCPC; Avantika Mann, PhD; Kimberly Vincent, MD; William Abramovits, MD, SIRTURO (bedaquiline), SIRTURO is the trademark of Janssen Therapeutics

CASE STUDIES

Vesna Petronic-Rosic, MD, MSc, MBA, Section Editor

Effective Management of Refractory Brunsting–Perry Cicatricial Pemphigoid with Dupilumab..... 405

Zaryab Alam, BS, Rashwan Alameddine, BS, Mojahed Shalabi, MD, Christopher T. Haley, MD

Successful Treatment of Recalcitrant 5-Fluorouracil-Induced Irritant Dermatitis with Roflumilast 0.3% Cream.. 407

Kareena S. Garg, BS; Leonardo Tjahjono, MD

CORRESPONDENCE

Snejina Vassileva, MD, PhD, Section Editor

Isolated Involvement of Umbilicus: A Rarity of Inverse Psoriasis..... 411

Shivani Bansal, MBBS, MD, MNAMS; Sushama Sushama, MBBS, MD

Real-Life Experience with Dupilumab in Moderate-to-Severe Atopic Dermatitis in Children Aged Less than 6 years: A Case Series..... 413

Patricia Amoedo, MD; Gilberto Pires Rosa, MD; Ana Cristina Nogueira, MD; Maria João Cruz, MD; Alberto Mota, PhD

Striae, an Immunocompromised Region, Resulting in Koebnerization of Lichen Planus..... 415

Prabin P. Dev, MD; Shikha Bansal, MD

Sentiment Analysis of Hirsutism Treatments on Twitter 417

Jonathan Xu, MS; Nicholas A. Ross, MD

Housewife's Hand Dermatitis and Pregnancy: Incidence of Atopic Diathesis..... 419

Yasubiro Horiuchi, MD

Sun Exposure in Paradise: Assessment of Sunscreen Use, Tanning, and Sunburning Behaviors in Bachelor in Paradise (Season 1 versus Season 8)..... 421

Jonathan Xu, MS; Rebecca Krain, MD; Nicholas A. Ross, MD

BOOK REVIEW

Jennifer L. Parish, MD, Section Editor

Procedures in Cosmetic Dermatology: Soft Tissue Augmentation 5th Edition..... 444

Saira Agarwala

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EDITORIAL

Limitations of Firewalls in Medical Societies: What is the Validity of Firewalls if the Same Individuals Are, Will Be, or Wish to Be on Both Sides of the Firewalls?

W. Clark Lambert, MD, PhD, FRCP (Edin.);¹ Anthony Gaspari, MD;² Albert Alhatem, MD;¹
Lawrence Charles Parish, MD, MD (Hon.), FRCP (Edin.)³

As physicians and healthcare providers, we rarely practice alone. We are entangled in ever more complex organizations that impact our medical practice. Many of these comprise our peers, which are both a blessing and a potential hindrance, even if the individuals who control these organizations have the best of intentions and are themselves wonderful people, as is usually the case. Let's explore some of the structural issues of such organizations.

Based on their size and stated mission, medical societies have somewhat similar structures. In contemporary medicine, the national societies tend to be organized around specialties, such as dermatology, primary care medicine, et cetera. As a recurring theme, there may be five or more groups:

1. Officers and a board of directors.
2. If the society sponsors a journal, as many do, then an editor, a set of associate editors, another set of assistant editors, and an editorial board.
3. One or more specialty certification board(s), which is/are often self-appointed and usually nominally independent of the society.
4. Hired staff or separate staffs, usually composed of non-practitioners.
5. The overall membership (rank and file), composed of physicians, who spend most of their time practicing medicine and little, if any, on the activities of other groups, but are subjected to the groups' decisions and commitments.

To maintain the integrity of these groups and prevent cliques of insiders from having or developing outsized influence, carefully designed firewalls are created, ostensibly to prevent any group from having undue influence on the activities of others. This is laudable, but there are limitations to this arrangement.

LET US LOOK MORE IN DEPTH

In most such societies, there is a nominating committee, which is carefully controlled, sometimes even by the hired staff. There is always a nominal alternate route to getting onto a ballot, but it is often next to impossible to use. In some societies, the board of directors and/or officers will even have separate committees to *oversee* or *interact with* their journal or the relevant certification board(s), a direct challenge to the firewalls. In virtually all of them, moreover, the members of the first three groups either are, will be, or wish to become a member of another group, an additional, but much less transparent, challenge to these firewalls. As a result, members of any of the first three groups rarely take any action that may displease or potentially annoy members of any of the other two groups, even though this is contrary to the interests of the membership (group 5).

VOTING

By the current year, most voting is done through an outside agency to ensure the integrity of the process. The weakest link would be the nominating committee. Once the ballot is created, how many of the rank and file actually take time to vote, let alone

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care about the process? Some members, in an attempt to express frustration with what they consider inappropriate interference with a fair process, may even deliberately withhold their vote.

FLY-OVER MEMBERS

On several issues, the rank and file, group 5 in the above schematic, are horrifically underrepresented, as are voters in many parts of the United States living in the areas ignored by politicians and others, derisively designated as *fly-over country*—we suspect that group 5 may represent *fly-over members*, with unfortunate results. One outstanding example is a requirement of these members to undergo a *recertification* process, usually every 10 years, administered by the certification board in their specialty. Few would argue against the need for such a process, but it is often made very much harder for members to survive than it needs to be. We have written elsewhere about how making this process more challenging than necessary accrues the boards and the members thereon much additional funds and power; yet, they are unlikely to hear criticism from the officers of their professional society or its journal editors for the reasons noted above. The membership be damned!

GROUPTHINK

Because the members of the above first four groups are unlikely to be criticized by the members of any of the other three groups and are in a position making it easy to ignore the fifth group, they are insulated from advice that may protect them from making even egregious errors.

Many years ago, the board of directors of the Woolworth Corporation faced a difficult situation. At one time, their stores were widespread throughout the United States and elsewhere, and virtually everyone knew their name; however, more recently almost, if not, all of their stores have closed. Their name is about all with which they are left, although it still has value, because it is

so well known. What did they do? They changed their name! An idiotic decision that only some of the members would have made. This decision, known in business schools as the “Woolworth decision,” is an example of groupthink, in which a group of individuals makes a terrible decision that not one of them would have thought to make individually.

Another example occurred due to inattentive management within a large corporation, Annheiser Busch Corporation. This company used a transgender woman to promote their product, Budd Light®; she was out of touch with their customer base, which resulted in alienation of their customers. After this, their sales plummeted along with their stock. This decision was later attributed to a mid-level executive acting alone.

Even more recently, Jaguar Motors, vendors of their famous motor vehicles, appeared on the same track. Although their advertisements were rather pretty, they failed to show their most attractive selling point—the cars, themselves.

The structure of medical societies makes them particularly susceptible to this type of potentially fatal flaws.

A MODEST PROPOSAL (WITH APOLOGIES TO JONATHAN SWIFT)

We propose that officers and board members, as well as editors and editorial board members of journals associated with medical societies, pay particular attention to the issues raised herein. They must be reminded regularly and frequently about these issues. We also propose that, to facilitate communication between the rank and file of such societies, suggestion boxes must be displayed prominently and clearly labeled at all meetings of such societies. Each entry must be regularly opened and read by the officers, board members, editors, and hired staff of each such society. All of these people must then report back to the members in an open meeting.



COMMENTARY

Commentary on “Garg KS, Tjahjono L. Successful Treatment of Recalcitrant 5-Fluorouracil-Induced Irritant Dermatitis with Roflumilast 0.3% Cream”

W. Clark Lambert, MD, PhD, FRCP (Edinburgh); Muriel W. Lambert, PhD

This case report of successful treatment of recalcitrant dermatitis induced by 5-fluorouracil (5-FU) is a welcome addition to the dermatologic literature. 5-FU has become a mainstay of management for the prevention and treatment of skin cancers and actinic keratoses in certain at-risk populations, notably in patients with the sun-sensitive skin cancer-prone genodermatosis, xeroderma pigmentosum (XP).¹⁻⁴ In XP patients, considerable variation is discovered in disease severity and complications, because the disease is known to be caused by mutations in any of at least eight separate genes scattered all around the genome, and these mutations may vary depending on where and what is altered within each gene.

In the majority of XP patients, however, the chief concern is the development of massive numbers of skin cancers induced by sun exposure. Until recently, rigorous sun protection was usually an insufficient protection, and most patients in the Third World countries eventually died of sepsis from these tumors, while patients in more developed countries died because of metastatic disease from these cancers.

In XP patients, where appropriate, topical 5-FU is applied in a slightly different manner. As soon as XP is diagnosed, it is applied in a concentration of 2–8%, as tolerated, in an aqueous base at all sun-exposed skin surfaces. Initially, this is usually done once a day for 3 weeks, followed by a 3-month interval; again, the process is repeated for the duration of patient's life, with modifications, for each patient, as appropriate.

Since the introduction of this treatment in 2015,¹ the present authors have treated seven patients, and others have treated many more with topical 5-FU and a number of other modalities,

particularly imiquimod, with excellent results.¹⁻⁴ One patient in the most severe complementation group of XP, that is Group A, with only 2% normal levels of DNA repair-related DNA synthesis (“unscheduled DNA synthesis” [UDS]), whose older sibling had died in childhood because of the massive number of skin cancers, recently graduated from college and became engaged.

Adverse reaction of 5-FU was discovered in only one patient, who developed defective proprioception because of internal medication by licking her lips following topical application. This was completely reversible following changing topical treatment to imiquimod. We now specify applying an emollient over 5-FU if applied around the mouth.

More recently, a second drug, calcipotriol (0.0005% topical preparation) has been added to topical 5% 5-FU to treat actinic keratoses, with excellent results.⁵ Calcipotriol is a vitamin D analogue that induces differentiation of rapidly proliferating keratinocytes. It must be helpful in treating XP as well. Similarly, individuals with albinism may benefit from these topical treatments, as also certain organ transplant recipients, who also develop numerous skin cancers at sun-exposed sites.

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REVIEW

Lipophagic/Lipoatrophic Panniculitis: An update on clinicopathologic features, pathogenesis, and management

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ABSTRACT

Lipophagic (or lipoatrophic) panniculitis is a unique rare panniculitis characterized by a nodular and infiltrative plaque-like phase that progresses to an atrophic phase. It usually affects the lower extremities, especially the ankles and legs. Constitutional symptoms are common. Though primarily described in children, lipophagic panniculitis has also been reported in adults. Histologically, lobular panniculitis is present with a predominance of lipid-laden macrophages. Its pathogenesis is unclear, although autoimmunity is believed to contribute, given the association of lipophagic panniculitis with various autoimmune disorders. Differential diagnosis may include important entities that should be excluded, such as subcutaneous panniculitis-like T-cell lymphoma, gamma-delta T-cell lymphoma, or lupus profundus. This review aims to assist dermatologists in considering and recognizing this entity, avoiding misdiagnosis with possible mimickers, and highlighting the available therapeutic options. (*SKINmed.* 2025;23:354–357)

INTRODUCTION

In 1980, Umbert and Winkelmann reported one of the first series of a unique type of panniculitis called lipophilic granulomatous lipoatrophy. They documented three cases and highlighted that the morphology of the lesions changed over time from erythematous plaques to atrophic lesions, commonly associated with constitutional symptoms.¹ Later, additional cases, under various terms such as annular atrophic panniculitis of the ankles, lipoatrophic panniculitis, lipophagic panniculitis, annular and semicircular lipoatrophy, abdominal lipoatrophy, and connective tissue panniculitis, have been reported, sharing similar clinicopathologic presentations to the original description.²⁻²⁵ We provide an update on this relatively rare condition's clinical and microscopic characteristics, its pathogenesis, and available treatment options and highlight clues that allow its differentiation from mimickers.

METHODS

Using PubMed and SCOPUS databases, we performed search inquiries for “lipoatrophic panniculitis,” “lipophilic

panniculitis,” “lipophilic granulomatous lipoatrophy” and “annular lipoatrophic panniculitis, of the ankles.” We included all articles on this topic regardless of language or publication date and also checked the references of these articles for any additional relevant studies. After eliminating duplicate studies and assessing the contribution's relevance, we included 25 relevant references in the manuscript.¹⁻²⁷

ETIOPATHOGENESIS

The etiopathogenesis of this distinctive rare panniculitis is not completely clear.^{3,4,9,13,14,26} Infectious causes have been suggested, especially with some identifying a history of EBV infection in some patients.^{9,10} On the other hand, many consider the potential role of autoimmunity in its pathogenesis, given its common association with different autoimmune disorders. CD83-positive histiocytes in the vicinity of adipocytes suggest an actual autoimmune etiology.¹⁰ Given that CD83 is the most terminally differentiated dendritic cell marker involved in antigen presentation, a type-IV hypersensitivity targeting adipocytes is thus believed to be at play.^{10,26} In addition, a genetic autoinflammatory

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predisposition has been postulated by one group that reported a karyotype abnormality on the long arm of chromosome 10 associated with lipoatrophic panniculitis.²⁷ Supernumerary alleles for the IL-2 receptor gene, which map to chromosome 10p15 region, are theorized to facilitate lipoatrophic panniculitis development by increasing sensitivity to circulating IL-2.

CLINICAL FEATURES

The first cases of lipophagic panniculitis had been described as a distinctive type of panniculitis that occurs most commonly in children and women.¹⁻²⁷ One of the hallmark features of this condition is a clinical evolution that begins with a nodular and infiltrative plaque-like phase and progresses to an atrophic phase a few months later (Figure 1).¹⁻²⁷ The extent of atrophy can be severe, particularly in the ankles, where it can lead to a unique bilateral annular lipodystrophic appearance.³⁻⁶ It can also present as tender, erythematous indurated plaques that precede circumferential tissue atrophy, with peau d'orange changes.¹⁹

Interestingly, the presentation can mimic Lyme disease.¹⁸ Though ankle/leg involvement is the more commonly reported area affected, more proximal extremity and diffuse involvement have also been described.²⁶ Although much of the literature concentrates on pediatric cases, this rare inflammatory panniculitis has also been described in adults with similar clinicopathologic features.^{11,12,26} Patients often experience constitutional symptoms such as fever, arthralgias, myalgias/cramps, liver function abnormalities, and/or splenomegaly during flare-ups. In addition, associated hematologic abnormalities such as anemia and thrombocytosis have been described.^{9,13,26}

This panniculitis has commonly been associated with different autoimmune disorders such as vitiligo, alopecia areata, Hashimoto's thyroiditis, Grave's disease, inflammatory bowel disease, celiac disease, rheumatoid arthritis, type I diabetes mellitus, among others.^{8,9,13,26} These autoimmune disorders may develop

years after lipophagic panniculitis onset. Positive anti-nuclear antibody serology has also been associated with positive thyroid autoantibodies incidentally demonstrated in a child with the condition in the absence of thyroid disease.^{13,21,26} There has been no progression of this panniculitis into subcutaneous panniculitis-like T cell lymphoma (SPTCL) or gamma delta T cell lymphoma.

HISTOLOGICAL FEATURES

A deep punch or incisional biopsy with a clinicopathologic correlation classically accomplishes the definitive diagnosis. Lipophagic panniculitis is classified as one of the lobular panniculitides without associated vasculitis (Figure 2).^{3,4,10,13,26} Histological examination reveals an inflammatory cell infiltrate generally composed of lymphocytes, histiocytes, plasma cells, and lipid-laden macrophages with lipophagic granuloma formation.^{9,13,26} Occasional neutrophils and eosinophils may be seen. A rimming pattern is usually not a feature. The presence of germinal centers has uncommonly been described.^{11,12} Despite this diverse inflammatory cell infiltrate, there is no phagocytosis of nuclear cell debris or erythrocyte engulfment. The overlying epidermis and dermis are generally unremarkable, though the eccrine coils may exhibit some inflammation. Pauci-cellular fat lobules with prominent fibrosis and lipophage accumulation.^{3,4,13,26}

Immunohistochemical evaluation is not routinely done; however, phenotypic examination of the inflammatory cells reveals T-cell



Figure 1. Following an erythematous indurated phase, atrophic phase is evident on the lower extremity.

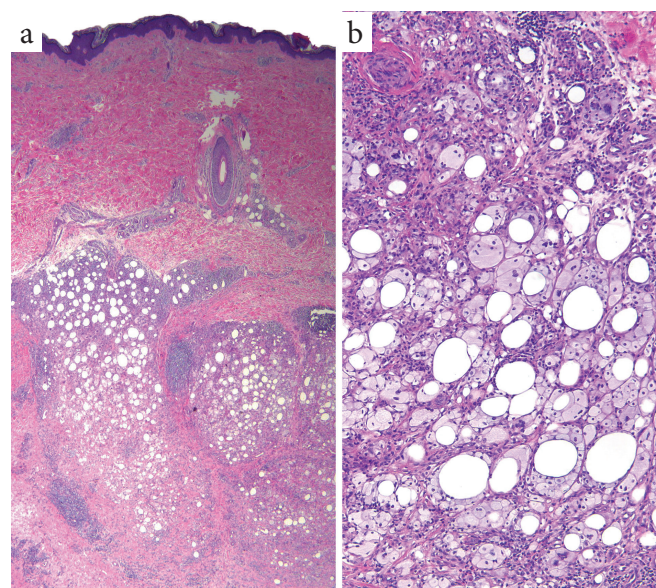


Figure 2. Histopathology exhibits a predominantly lobular panniculitis with infiltration of the subcutaneous tissue with histiocytes/lipid-laden macrophages with accompanying lymphoplasmacytic infiltrate (hematoxylin-eosin a x20, b x400).

lymphocytic infiltration with a tendency towards a CD8 predominance with cytotoxic features.^{13,14,26} CD68 and CD163 can highlight the histiocytes. Direct immunofluorescence studies and cultures for different microorganisms are usually negative.²⁶

DIFFERENTIAL DIAGNOSIS

Various cutaneous disorders affecting the subcutaneous tissue could potentially be mistaken for lipophilic panniculitis, such as subcutaneous panniculitis-like T-cell lymphoma (SPTCL), gamma-delta T-cell lymphoma affecting the adipose tissue, lupus profundus, subcutaneous morphea, and localized involutinal lipotrophy (Table 1).¹⁻²⁹

TREATMENT AND PROGNOSIS

Lipotrophic panniculitis remains challenging to treat as there is no standard effective therapy. The lack of prospective studies and long-term follow-up makes assessing the different therapeutic options available difficult. Based on anecdotal reports and clinical experience, corticosteroids and immunosuppressive agents may be of value.^{11-13,17,19,20} Systemic steroids are usually needed initially

to suppress the inflammatory phase and may later be necessary to control acute exacerbations. Variable therapeutic responses to immunosuppressive agents have been described mostly with the use of hydroxychloroquine and methotrexate, among others. In refractory cases, anti-tumor necrosis factor- α therapy may be considered.¹⁵ Nonsteroidal anti-inflammatory drugs may decrease the discomfort associated with constitutional symptoms.^{2,13,17}

Despite treatment, the atrophic stage of lipotrophic panniculitis is usually inevitable. The late disfiguring complications may require reconstructive surgery with autologous fat grafting after the inflammatory phase subsides.^{17,22}

CONCLUSION

Lipohagic/lipotrophic panniculitis is a rare cutaneous condition with a characteristic clinical presentation and natural course characterized by inflammatory panniculitis followed by the development of permanent lipotrophy, mainly seen in children but also reported in adulthood. When clinically suspected, histologic confirmation is recommended to exclude mimickers, and a workup for possible associated autoimmune diseases is needed. Initiating early treatment may help control the disease, before

Table 1. Differentiating lipohagic/lipotrophic panniculitis from other panniculitides with an emphasis on clinical and microscopic clues.

ENTITY	LOCATION	CLINICAL PRESENTATION	HISTOLOGICAL FINDINGS
Lipohagic/ Lipotrophic Panniculitis	Lower extremities +/- proximal extremity and diffuse involvement	Tender, erythematous indurated plaques that heal with circumferential tissue atrophy	Lobular panniculitis without vasculitis. Macrophages exhibit adipocyte phagocytosis. No phagocytosis of nuclear cell debris or erythrocyte engulfment. Unremarkable epidermis. paucicellular fat lobules with prominent fibrosis and lipophage accumulation in the late phase. CD163+, CD68+
Subcutaneous panniculitis-like T-cell lymphoma	Lower and upper extremities, trunk	Skin lesions mimic lipomas	Macrophages exhibit erythrocyte phagocytosis. Internalization of lymphocytes and histiocytes within the adipocyte. Infiltration of the dermis with dermal mucin. CD8+, CD5-, CD7-
Gamma-delta T-cell lymphoma	Extremities with relative sparing of the trunk	Deep dermal or subcutaneous nodules, some of which ulcerate	Overlying dermal and epidermal involvement with neoplastic cell infiltration. CD4-, CD8-, beta F1-, Reduction in CD5 and CD7
Lupus profundus*	Upper arm, shoulders, and buttocks +/- face	Persistent, firm, deep, tender erythematous nodules and plaques that heal with lipotrophy	Lymphocytic lobular panniculitis with secondary lobular hyalinization and sclerosis, eccrine hidradenitis, interface dermatitis, mesenchymal mucin deposition, marked hyperkeratosis, lymphoid follicles, immunofluorescence studies often positive
Subcutaneous morphea	Arms and shoulders	Indurated nodules/plaques often resolve with atrophy/hyperpigmentation	Marked sclerosis and fibrous thickening of the subcutaneous septa, at times with overlying epidermal and dermal morphea changes
Localized involutinal lipotrophy	Often involves injection areas	Solitary atrophic depression, no preceding inflammation	Diminutive fat lobules composed of small adipocytes in hyalinized, highly vascularized stroma

lipoatrophy settles. Autologous fat injection can be considered in late lipoatrophic strategies depending on the psychologic impact. Further studies are needed to uncover the underlying pathogenesis and identify with certainty possible therapeutic options.

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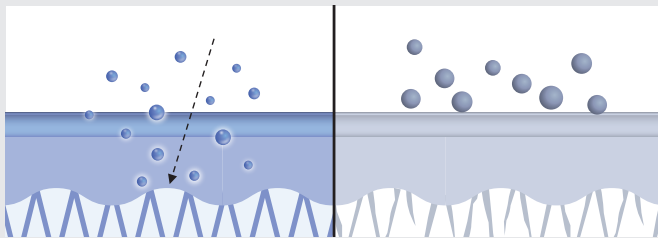
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MEETING PROCEEDINGS

The 2025 Skincare Education Symposium (SES)

Virtual Symposium, May 6th and May 22th, 2025

Shereen Teymour, DO¹; Hilary E. Baldwin, MD²; Raj Chovatiya, MD, PhD, MSCI³; Joel L. Cohen, MD⁴; Doris Day, MD, MA⁵; Zoe Diana Draelos, MD⁶; Cheri Frey, MD⁷; Mona A. Gohara, MD⁸; Dee Anna Glaser, MD⁹; Karan Lal, DO, MS¹⁰; Heather Woolery-Lloyd, MD¹¹; Joshua Zeichner, MD¹²

The Skincare Education Symposium (SES) 2025 shared expert insights on the latest scientific advances and clinical applications of cosmeceuticals, nutraceuticals, and skincare treatments. The virtual meeting was conducted to an online audience. Topics covered included best practice in using specialized cosmeceuticals ingredients and nutraceuticals, plus combining them with laser therapy and other devices.

SUPPLEMENTS AND NUTRACEUTICALS

DORIS DAY, MD

Doctor Doris Day offered a compelling perspective on the growing role of nutraceuticals in dermatology, emphasizing that skin health is shaped by epigenetics and lifestyle choices, rather than by genetics alone. Healthy habits, including sun protection, a balanced diet, and stress management, combined with strategic supplementation, can dramatically influence the aging process.

Among her top recommended supplements (Table 1.) are Vitamin D with Vitamin K for hair and skin and autoimmune benefits, Magnesium glycinate and L-Threonate for brain and muscle support, Omega 3 with CoQ10 for skin and heart support, NAD⁺ precursors (NMN, NR) for mitochondrial and cellular function, and polypodium leucotomos extract (PLE) for photoprotection. She also highlighted the use of such probiotics Akkermansia (Pendulum Health) and turkey tail mushroom extract for gut and immune support. Collagen supplements, especially those that are marine-derived and taken as liquid form rather than gummies or pills, may provide benefit for skin elasticity and hydration. Lastly, she discussed telomere preservation through agents like TA65, reinforcing the idea that slowing cellular aging can extend one's health span.

Doctor Day cautioned that not all supplements are created equal. Quality control, bioavailability, and clinical data are essential

when evaluating efficacy and recommending particular products. Her takeaway message was that nutraceuticals do not replace healthy habits or skincare products, but they can be valuable adjuncts in optimizing skin health and aging.

PHOTOPROTECTION ON 2025

ZOE DRAELOS, MD

Doctor Zoe Draelos provided an overview of modern sunscreens, emphasizing their evolution from simple UV filters to sophisticated multifunctional formulations. The components of the UV spectrum include UVC rays, which are blocked by the ozone layer, UVB rays, which cause sunburn, and UVA rays that penetrate deep into the skin, accelerates aging, and may lead to skin cancer. All Fitzpatrick skin types are vulnerable to sun damage, although darker skin provides greater natural photoprotection.

Modern day sunscreens go beyond UVB/UVA protection to also defend against visible and infrared light (Table 2.). These rays are key contributors to the development of hyperpigmentation and photoaging, especially in patients with skin of color. Specialty sunscreens include products that provide added benefits beyond UV protection, such as pigmentation control, barrier repair, and oil reduction. Tinted mineral sunscreens with zinc oxide and iron oxides often blend well across skin tones and protect against visible light. Oil-control sunscreens combine zinc oxide with kaolin to absorb sebum, while moisturizing formulations pair SPF with humectants like glycerin and hyaluronic acid.

Doctor Draelos also highlighted barrier-repair sunscreens containing ceramides, sensitive skin formulas made with only inert mineral filters, and pigment-control products that incorporate tyrosinase inhibitors like licorice root. Anti-aging sunscreens contain antioxidants such as vitamins C and E, which protect against oxidative stress but do not contribute to SPF.

From the ***

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Table 1.

INGREDIENT	MECHANISM/ACTION	CLINICAL BENEFITS
Curcumin	Anti-inflammatory, antioxidant, immunoregulatory	Lessens psoriasis severity, boosts circulation and antioxidant levels
Ashwagandha	Lowers cortisol, supports stress axis, improves blood flow	Improves stress resilience and reduces inflammation
Tocotrienols	Potent form of vitamin E; neutralizes oxidative stress	Increases hair count, decreases scalp oxidative stress
Saw Palmetto	Blocks DHT via 5- α reductase inhibition; balances hormones	Prevents conversion of testosterone to DHT, improves libido
Genistein	Estrogenic, photoprotective, antioxidant	Reduces UVB damage, improves elasticity and skin appearance
Cucumis Melo (SOD)	Primary antioxidant enzyme, protected delivery for absorption	Improves luminosity (+26%), reduces imperfections (-18%)
Niacinamide	Supports NAD+, collagen, reduces inflammation	Reduces redness, pore size, improves collagen and skin tone
L-Carnosine	Anti-glycation, chelates metals, antioxidant	Supports skin firmness and has antiaging properties
Polypodium Leucotomos	Protects DNA, immune-modulating, reduces sun reaction	Adjunctive to sunscreen
Resveratrol	Antioxidant, supports heart/brain health	Anti-aging and neuroprotective benefits
Quercetin	Anti-inflammatory, NAD+ support, senescence clearing	Reduces hair loss, improves metabolism and cell cleanup?
Hydrolyzed Collagen Type II	Supports dermal fibroblasts, replenishes collagen and glycosaminoglycans (GAGs)	Supports collagen type II and i/III

Table 2.

SPECIALTY SUNSCREEN TYPE	KEY INGREDIENTS/FEATURES	MAIN BENEFIT
Tinted	Zinc oxide, titanium dioxide, iron oxide, synthetic mica	Protects against visible light-induced pigmentation
Oil Control	Zinc oxide, titanium dioxide, kaolin	Absorbs oil, reduces shine
Oil-Free	Silicone oils, noncomedogenic, clear-face formulas	Useful for acne-prone skin
Moisturizing	Dimethicone, glycerin, hyaluronic acid	Improves skin feel through hydration
Barrier Repair	Ceramides for stratum corneum barrier support	Improves skin barrier function
Sensitive Skin	Inorganic filters only	Minimizes irritation potential
Pigment Control	Licorice extract (glycyrrhetic acid), resorcinol derivative	Reduces hyperpigmentation
Anti-Aging	Sodium hyaluronate, antioxidants (tocopherol, glycyrrhetic acid, etc.)	Hydration, antioxidant support for fine lines
Antioxidant	Vitamin C, E, niacinamide, licorice root, beta-carotene, caffeic acid	Neutralizes ROS, supports skin defense (not SPF)
Water Resistant	Tested for 80 minutes immersion under FDA guidelines	Maintains protection after water exposure
Dry Touch	Non-greasy feel, no tacky film- consumer appeal only	Aesthetic, provides marketing appeal
Baby	No unique formulation- sold in baby aisle; same as adult sunscreen	Gentle perception, marketing toward infants

She emphasized that these innovations improve both efficacy and wearability which are key to increasing patient compliance. As sunscreens become increasingly tailored to different skin needs and cosmetic concerns, there are now more personalized, aesthetically pleasing options.

THE LATEST IN TREATING COSMETIC CONCERNS IN SKIN OF COLOR

HEATHER WOOLERY-LLOYD, MD

Doctor Heather Woolery-Lloyd presented a comprehensive update on managing cosmetic concerns in skin of color, with a

Table 3.

INGREDIENT/APPROACH	MECHANISM/ACTION
Thiamidol	Human tyrosinase inhibitor, reduces melanin synthesis
2-MNG	Binds & inactivates melanin precursors, inhibits melanogenesis
Lotus Sprout Extract Combo	Degrades melanosomes; combined with tranexamic acid, niacinamide, others
Tranexamic Acid	Plasmin inhibitor; reduces melanin synthesis; used orally, topically, intradermally
Cysteamine	Multimodal depigmenting agent; reduces mMASI scores more than Kligman formula (tretinoin, hydroquinone, dexamethasone)
PATH-3	Peptides downregulate melanogenesis & inflammation; includes lactoferrin, hexapeptides
Topical Metformin	Improves MASI comparable to Kligman formula cream with fewer side effects
Iron Oxides (Black/Red)	Black iron oxide blocks visible light; red/yellow mainly blocks UV
Antioxidant-Enriched Sunscreens	Antioxidants enhance protection against UVA1 and visible light

focus on hyperpigmentation. While melanin provides protection against some signs of photoaging, it also predisposes patients to develop dyschromias like melasma and post-inflammatory hyperpigmentation (PIH). She shared a study that revealed uneven skin tone alone can make someone appear up to 20 years older, highlighting the cosmetic significance of pigmentary concerns.

Doctor Woolery-Lloyd reviewed several new topical ingredients showing promise in treating dyschromia (Table 3.). Thiamidol, the only known inhibitor of human tyrosinase, outperformed even 4% hydroquinone in clinical trials. 2-MNG works by binding melanin precursors, reducing both pheo- and eumelanin, with visible improvement in darker-skinned patients- even without sunscreen. Lotus sprout extract, in a combination formula, demonstrated comparable results to hydroquinone in a split-face study of patients with Fitzpatrick types IV–VI. Other new agents like cysteamine, PATH-3 (a multi-targeted peptide complex), and topical metformin have each shown non-inferiority in clinical trials comparing them to traditional triple combination therapy in reducing MASI scores.

The role of visible light exposure was also explored, being a known contributor to pigmentary disorders. Melanocytes contain a sensor known as opsin-3 that is activated in response to blue light, contributing to melanin production. One method of protection is the use of iron oxide pigments found in tinted sunscreens, which provide primary visible light protection. Traditional UV filters do not protect against visible light, but the iron oxide pigments used in tinted formulas give not only cosmetic coverage, but also visible light protection. Some chemical sunscreens with antioxidant ingredients can provide secondary protection against visible light, mitigating the free radical-induced changes that visible light exposure creates. This offers additional options for patients who prefer non-tinted products.

In summation, there are a variety of cosmeceuticals with novel, safe, and tolerable options to manage pigmentary disorders in skin of color.

HOT INGREDIENTS IN SKINCARE

JOSHUA ZEICHNER, MD

Doctor Joshua Zeichner highlighted the latest, buzzworthy skincare ingredients, discussing their mechanisms, clinical data, and practical takeaways (Table 4.).

He provided updates on the use of topical retinoids. New data from Neutrogena® demonstrated that the *moisture sandwich* method (moisturizer–retinoid–moisturizer) may actually decrease topical retinoid penetration and activity in the skin. For patients newly starting retinoids or those suffering from irritation, layering the retinoid with a moisturizer can help improve tolerability.

Next, he spotlighted the use of peptide technologies in skincare. TriHex® peptides from Alastin may stimulate new collagen and eliminate damaged elastin. He also discussed thiamidol, a human tyrosinase inhibitor with efficacy rivaling hydroquinone, without the associated irritation or ochronosis risk. It also shows promise in preventing post-laser hyperpigmentation.

Doctor Zeichner then discussed *aquaphilus dolomiae*, a postbiotic ingredient from Avène, which helps to modulate inflammation and sensory nerve response. 12-hydroxy stearic acid, which is used in Dove® body washes, has been shown to improve skin tone, reduce oil production, and improve skin barrier function. Spermidine is a polyamine antioxidant from Nutrafol® found in a nutraceutical supplement that may support autophagy and extends the anagen phase of hair growth.

Table 4.

INGREDIENT	FUNCTION	ADDITIONAL NOTES
Tretinoin / Retinol	Improves cell turnover, anti-aging	Bioactivity retained when layered with water gel/cream moisturizer in 'open sandwich' regimen
TriHex Peptides	Supports neocollagenesis and ne elastogenesis	Promotes ECM repair and renewal
Thiamidol	Tyrosinase inhibitor	Reduces pigmentation, shown effective in melasma and PIH
Aquaphilus dolomiae Extract (ADE-G3)	Postbiotic extract with anti-inflammatory properties	Improves skin barrier and modulates sensory nerve activity
12-Hydroxystearic Acid (12-HSA)	Brightening and anti-inflammatory	Reduces melanin transfer and lipogenesis
Spermidine	Anti-aging, hair growth promoter	Enhances Wnt signaling, promotes anagen phase
Aquaxyl (Xylitylglucoside + Anhydroxylitol + Xylitol)	Hydration	Sugar-based humectant, enhances glycerin activity
Hexapeptide-9	Skin barrier strengthening	Mimics LCE6A protein
Centella Asiatica	Wound healing, anti-inflammatory	Stimulates collagen I synthesis
Mandelic Acid	AHA exfoliant	Targets oily and acne-prone skin
Selenium Sulfide	Anti-fungal, dandruff treatment	
Zinc Pyrithione	Anti-fungal, anti-dandruff	

In hydration, Bubble® skincare has brought the combination of aquaxyl (a sugar-based humectant trio) and hexapeptide-9 in a moisturizer that both improves barrier function and hydration. He also spotlighted a unique pairing of Centella asiatica and mandelic acid from Galderma®, which provides hydration, exfoliation, and skin firming benefits.

Finally, he noted updates in dandruff care with selenium disulfide and zinc pyrithione in new formulations from Vichy® and CeraVe® that now incorporate ceramides and niacinamide to preserve skin barrier health.

Today's *hot* ingredients offer such multifunctional benefits as anti-aging, pigment correction, and barrier repair which are designed to meet modern skincare demands with more personalized and tolerable options.

SKINCARE NEEDS IN ECZEMA AND PSORIASIS

RAJ CHOVATIYA, MD, PhD

Doctor Raj Chovatiya delivered an overview of the essential role skincare plays in managing chronic inflammatory conditions, particularly dermatitis and psoriasis. Dermatitis is characterized by impaired skin barrier, immune dysregulation, microbial imbalance, and heightened neuronal sensitivity. As a result, moisturizers provide a foundational component of treatment. Doctor Chovatiya emphasized that effective skincare is not just complementary, it is integral to disease control. Moisturizers can be used as monotherapy for mild cases and are an essential

adjunct to topical and systemic treatments in moderate-to-severe disease. Clinical trials for systemic therapies typically include a pre-treatment moisturization run-in and specific moisturizer recommendations during the trial, underscoring its critical impact.

Global consensus guidelines recommend consistent moisturizer use in dermatitis. Twice-daily application is advised both during flares and periods of remission. Optimal formulations combine emollients, humectants, occlusives, and physiologic lipids like ceramides. Colloidal oatmeal stands out as the only FDA-approved OTC active ingredient as a skin protectant. There is additional data on colloidal oatmeal that supports the anti-inflammatory, anti-pruritic, and barrier-restoring properties. Multiple studies have shown that daily use of oat- and ceramide-based moisturizers can reduce flare frequency and delay disease onset in such patients, including infants.

While evidence is less robust for use in psoriasis as compared to dermatitis, skin barrier dysfunction and xerosis are still important factors. Moisturizers may help to help soften plaques, enhance drug penetration, and lessen the need for topical corticosteroids. Despite limited guideline inclusion, early data suggest ceramide-containing products may be beneficial in treating psoriasis. He concluded with a call for deeper exploration of skincare's potential in psoriasis and reaffirmed moisturization as a core pillar of care in both conditions. A summary of commonly used ingredients in skincare products designed for dermatitis and psoriasis is listed in Table 5.

Table 5.

CONDITION	INGREDIENT/APPROACH	MECHANISM/BENEFIT
Eczema	Colloidal Oatmeal	Skin protectant; anti-inflammatory, anti-pruritic; pH buffering; FDA-recognized
	Ceramides	Skin lipids replenishment; support of barrier homeostasis; reduces pruritus
	Humectants, Emollients, Occlusives	Hydration, moisture retention, and skin barrier repair
	Licochalcone A	Anti-inflammatory antioxidant effective in treatment atopic dermatitis in children
Psoriasis	Urea, AHA, BHA, Glycolic Acid	Keratolytic; reduces scaling, plaque softening, improved penetration
	Water-in-Oil Emulsions	Improved hydration; steroid-sparing effect in combination
	Soft Paraffin	Reduced hyperproliferation and plaque thickness
	Ceramides	Similar barrier repair role as in dermatitis

ADVANCEMENTS IN CLEANSERS AND MOISTURIZERS

MONA A. GOHARA, MD

Doctor Mona Gohara emphasized that moisturizers and cleansers are daily essentials for skin health. Moisturizers are functional tools that support barrier repair, aid in healing, and deliver active ingredients.

The most effective moisturizers combine three key categories of ingredients: humectants (e.g., glycerin, hyaluronic acid), emollients (e.g., dimethicone), and occlusives (e.g., petrolatum, lanolin). Choosing the right vehicle depends on skin type and cosmetic preference, but everyone benefits from daily use.

For cleansers, she recommended gentle, pH-balanced syndets over alkaline soaps and warned against harsh surfactants. Micellar waters, cleansing oils, and foaming cleansers each have distinct roles, and newer formulas can deposit barrier-supportive ingredients like ceramides or niacinamide while cleansing.

UPDATES IN RETINOL AND PEPTIDES

CHERI FREY, MD

Doctor Cheri Frey highlighted advances in two skincare pillars: retinols and peptides. All vitamin A derivatives convert to retinoic acid, with over-the-counter (OTC) forms like retinol esters, retinol, and retinaldehyde varying in potency by conversion steps. Newer double-conjugated retinoids, often paired with AHAs or salicylic acid, match prescription tretinoin in efficacy with less irritation and added hydration. The OTC hydroxypinacolone retinoate even showed results comparable to fractional CO₂ laser after 16 weeks.

On peptides, she outlined signaling, carrier, and neurotransmitter-inhibiting types. Smaller peptides, like AP31 (229 Daltons), penetrate efficiently, reducing inflammation and boosting

Table 6.

CATEGORY	INGREDIENT	FUNCTION
Humectants	Glycerin, Hyaluronic Acid, Sorbitol, Urea, Lactic Acid, Arginine, Sodium PCA	Attracts moisture to epidermis
Occlusives	Petrolatum, Lanolin, Mineral oil, Vegetable oils, Dimethicone/Cyclomethicone, Squalene, Waxes	Reduces water evaporation
Emollients	Sunflower/Argan/Olive Oils, Cholesterol, Squalene, Fatty Acids, Fatty Alcohols, Shea Butter, Caprylyl Glycol, Oatmeal	Provides hydration

collagen, elastin, and hyaluronic acid. Argireline, a neurotransmitter-inhibiting peptide, can soften fine lines and extend neurotoxin results.

Doctor Frey concluded that modern OTC retinols and peptides can rival in-office treatments, offering accessible, effective options for aging skin, acne, and barrier support.

ADDRESSING MATURE SKIN NEEDS WITH COSMECEUTICALS

DEE ANNA GLASER, MD

Doctor Dee Anna Glaser addressed the evolving needs of mature skin, emphasizing early intervention and patient education as critical strategies in dermatologic care. Aging skin may show changes in elasticity and collagen content in patients as early as the mid-20s in lighter Fitzpatrick types and by the 30s in darker skin. Proactive skincare is essential not only to delay visible aging but also to optimize outcomes for future procedures.

Her core regimen includes retinoids, antioxidants, moisturizers, and broad-spectrum sunscreen. She noted that tretinoin in a sodium hyaluronate base is effective and well-tolerated for sensitive or mature skin, while bakuchiol offers a gentler alternative.

Table 7.

INGREDIENT	MECHANISM/FUNCTION
Signaling Peptides: Palmitoyl Hexapeptide-12, Palmitoyl Pentapeptide-4, Palmitoyl Dipeptide-7, Palmitoyl Tripeptide-3/5, Acetyl Tetrapeptide-9/11	“Signal” cell turnover and stimulate fibroblast collagen production, proliferation of elastin, fibronectin, laminin, etc
Carrier Peptides: Copper Tripeptide-1 (GHK-Cu)	Carry metal ions, drugs into cells to stimulate repair by promoting angiogenesis and regulating inflammation. Emerging data for benefits of hair growth
Neurotransmitter Inhibiting Peptides: Acetyl Hexapeptide-3 (Argireline), Acetyl dipeptide-1 cetyl ester	Interfere with ACH release
Retinoids	Promote cell turnover, improve texture and fine lines
Hyaluronic Acid	Hydrate and plump skin by binding water into the dermis
Niacinamide	Brightens skin tone and reduces appearance of pores
Bakuchiol	Natural retinol alternative, improves elasticity and firmness
Tranexamic Acid	Reduces hyperpigmentation by inhibiting plasmin
Growth Factors	Supports wound healing and tissue regeneration
Botanical Extracts	Provides antioxidant, calming, and anti-inflammatory benefits

Table 8.

CATEGORY	KEY INGREDIENT	FUNCTION/MECHANISM
Antioxidants	Vitamin C	Neutralizes free radicals, improves radiance
	Protocatechuic acid	Antioxidant; may reduce oxidative damage
	Grammatophyllum speiosum	Plant extract with anti-aging potential
	Jasmine rice panicle extract	Brightens skin; antioxidant rice extract
Retinoids/Retinol	Retinol	Increases cell turnover, reduces wrinkles
	Adapalene	Retinoid alternative with tolerability
Retinoid Alternatives	Bakuchiol	Improves firmness, hyperpigmentation, collagen III
	Tetrahydrojasmonic acid	Anti-aging alternative to retinoids
Estrogen-related Actives	Methyl Estradiolpropanoate (MEP)	Estrogen analog to improve estrogen-deficient skin
	Timosaponin A-III	Anti-aging compound; estrogen receptor agonist
Acids and Hydrators	Urea	Hydrating, keratolytic
	Lactic Acid	Exfoliates and improves texture
	Lactate	Moisturizing component
	Ceramides	Restores skin barrier
	Glycolic Acid	Improves cell turnover
	Salicylic Acid	BHA exfoliates and targets acne
Oral/Topical Botanicals	Collagen	Structural protein; may support skin firmness
	Polypodium Leucotomos Extract	Antioxidant, reduces UV-induced ROS, improves melasma
Biologics	Polynucleotides (PDRN)	DNA-derived repair factor, promotes skin regeneration
	Exosomes	Extracellular vesicles with signaling potential

For peri- and postmenopausal patients who have estrogen-deficient skin, cautious use of topical estrogen can restore dermal thickness and elasticity.

Additional recommendations included glycolic and salicylic acids for xerosis, polypodium leucotomas for photoprotection, and such emerging agents as polynucleotides and exosomes to enhance healing and collagen stimulation when paired with procedures.

Doctor Glaser emphasized tailoring regimens to patient habits and preferences, ensuring mature patients can maintain skin health and maximize procedural benefits.

SKINCARE RECOMMENDATIONS IN ACNE AND ROSACEA PATIENTS

HILARY E. BALDWIN, MD

Doctor Hilary Baldwin reframed acne and rosacea as barrier-deficient disorders requiring intentional skincare, not just prescriptions. Acne is linked to increased transepidermal water loss and ceramide depletion, often worsened by harsh treatments and patient-driven remedies that cause dryness, irritation, and poor adherence.

She stressed that the right skincare may even lessen acne without medication, reduce side effects, and boost compliance. Ideal cleansers feature non-ionic surfactants, acidic pH, and hydrophobically modified polymers for stable micelles, less irritation, and satisfying foam. Salicylic acid cleansers with micro-gel technology enhance follicular penetration and antimicrobial effects without harming the barrier.

For rosacea, she recommended gentle, non-foaming cleansers and silicone-based moisturizers with ceramides, hyaluronic acid, and

niacinamide to hydrate, reduce inflammation, and strengthen the barrier.

Addressing post inflammatory hyperpigmentation, especially in patients of color, she highlighted two over-the-counter innovations: thiamidol, a superior tyrosinase inhibitor, and Melasyl™, which inactivates melanin precursors. Both reduce pigment without causing perilesional bleaching.

Doctor Baldwin urged that patients at every acne and rosacea visit be provided with specific product guidance, samples, and accessible purchasing options, ensuring patients leave informed and empowered.

WHAT'S NEW IN COSMECEUTICALS AND NUTRACEUTICALS

JOSHUA ZEICHNER, MD

Doctor Joshua Zeichner delivered a rapid-fire update on cosmeceuticals and nutraceuticals, offering practical, evidence-based insights on products patients already use or request.

TriHex Technology®, a peptide system that supports collagen and elastin production, is used daily and as a pre-procedural primer. Twice-daily use for eight weeks led to histological thickening and extracellular matrix remodeling.

Neutrogena Hydro Boost creams improves skin hydration, clarity, and tolerability. For pigmentary disorders, he highlighted Thiamidol, a human tyrosinase inhibitor, which reduced hyperpigmentation in melasma with less perilesional lightening than hydroquinone.

Table 9.

CATEGORY	KEY INGREDIENTS	FUNCTION/NOTES
Barrier Repair	Ceramides (EOP, NP, AP), Niacinamide	Rebuild lipid bilayer, reduce TEWL, improve SC hydration
Humectants	Hyaluronic Acid, Glycerin, Panthenol	Increase skin hydration, restore moisture balance
Exfoliants	Salicylic Acid, Lactic Acid	Reduce follicular plugging, decrease sebum, exfoliate
Anti-inflammatory Agents	Niacinamide, Hydrophobically Modified Polymer (HMP)	Calms skin, reduces erythema, improves medication tolerance
Surfactants	Sodium Cocoyl Isethionate, Coceth Sulfate, Potato Starch Surfactant	Cleanse skin with minimal barrier disruption, pH 4–6 preferred
Tyrosinase Inhibitors	Thiamidol, 2-MNG (2-Mercaptonicotinoyl Glycine)	Reduce PIH, block melanin synthesis, effective in darker skin types
Moisturizing Agents	Silicones, HA, Ceramides, Niacinamide (acidic pH preferred)	Replenish compromised barrier in rosacea/acne patients, less irritation
Antimicrobials	Zinc, Salicylic Acid (antibacterial/fungal)	Control bacteria and yeast contributing to acne or seborrheic dermatitis

Table 10.

CATEGORY	KEY INGREDIENTS	FUNCTION/NOTES
Peptides	TriHex Peptides (tripeptides + hexapeptides)	Supports ECM remodeling, neocollagenesis, and neoeelastogenesis; enhances pre- and post-procedure outcomes
Moisturizing Agents	Aquaporin-3, Filaggrin, Lipids, HA Binding Protein (HABP), NMF, Glycerol	Hydration, skin barrier repair, enhanced radiance, reduced dryness and dullness
Antioxidants	Niacinamide	Reduces inflammation, improves tolerability of acne and sensitive skin treatments
Acids	Mandelic Acid, Stearic Acid, Palmitic Acid, 12-HSA	Exfoliation, increased skin nourishment, improved ceramide production
Natural Extracts	Centella Asiatica, Aquaphilus Dolomiae Extract Ferment, Thiamidol	Soothes sensitive/reactive skin, anti-inflammatory, pigmentation control
Cleansing Agents	Micromoisture Technology	Enhances deposition of actives, improves sensorial experience
Barrier Support	Ceramides (EOP, NP, AP), Skin Activator Technology	Strengthens barrier, thickens aging/dermatoporosis-prone skin
Anti-Dandruff Agents	Zinc Pyrithione, Selenium Disulfide, Ketoconazole	Treats dandruff, soothes scalp, restores scalp barrier

On hair thinning, there is promising data showing Nutrafol improves hair density, quality, and patient satisfaction in both men and women. He also introduced Bubble's Cloud Surf Moisturizer with lilac extract to reduce sebum, modulate tyrosinase, and improve post-acne pigmentation.

For seborrheic dermatitis, he presented a CeraVe shampoo with 0.6% selenium disulfide and ceramides, which matched ketoconazole's efficacy with better cosmetic elegance, even for color-treated hair.

Doctor Zeichner concluded that accessible, evidence-backed skin-care innovations are advancing quickly, and dermatologists must stay informed to guide patients effectively.

ANTIOXIDANTS AND ACIDS

KARAN LAL, DO

Doctor Karan Lal explored the science and clinical use of top antioxidants and acids, clarifying which formulations best suit specific skin concerns.

He began with vitamin C, the skin's most abundant antioxidant, noting that humans must apply it topically. Its most active form, L-ascorbic acid, is unstable and requires an acidic pH under 3.5 for penetration, which can irritate. Concentrations of 8–20%, stabilized with ferulic acid and vitamin E, enhance photoprotection and collagen synthesis. Vitamin E and glutathione work synergistically with vitamin C, with 2% topical glutathione improving pigmentation, smoothness, and wrinkles while supporting the barrier.

Niacinamide, a vitamin B3 derivative, is known for strengthening the barrier, reducing inflammation, and fading pigmentation. Safe for all skin types, it performs comparably to hydroquinone and is even suitable for pediatric use.

Table 11.

INGREDIENT	FUNCTION/MECHANISM
Vitamin C (L-ascorbic acid)	Most active form of vitamin C; requires low pH; boosts collagen, antioxidant
Vitamin E (α -tocopherol)	Fat-soluble antioxidant; enhances C; reduced by UV
Glutathione (GSSG)	Brightens skin; inhibits tyrosinase; used in hyperpigmentation/melasma
Niacinamide	Hydrating, anti-inflammatory, improves pigmentation, UV protection
Ferulic Acid	Stabilizes vitamins C & E; enhances photoprotection
Glycolic Acid	Smallest AHA; hydrates, improves texture, acne, pigmentation, fine lines
Lactic Acid	Larger molecule; more hydrating, less penetration; increases skin thickness
Mandelic Acid	Gentle AHA; antimicrobial, good for acne and sensitive skin Used in salicylic-mandelic acid combo peels for acne and hyperpigmentation
Azelaic Acid	Anti-inflammatory and antimicrobial; used in acne and rosacea

In discussing acids, Dr. Lal noted that mandelic acid is a gentle, antimicrobial AHA ideal for sensitive, acne-prone skin. Glycolic acid, the smallest AHA, penetrates deeply and stimulates collagen, making it well-suited for aging and photodamaged skin. Lactic acid is more hydrating than glycolic acid and improves skin thickness, making it ideal for crepey skin. Azelaic acid is a multitasker for acne, rosacea, and hyperpigmentation that also preserves the barrier and is particularly useful for perioral dermatitis. He underscored the importance of ingredient selection and formulation for optimizing outcomes across diverse patient needs.

COMBINING COSMECEUTICALS AND ENERGY-BASED DEVICES

JOEL COHEN, MD

Doctor Joel Cohen discussed integrating cosmeceuticals with lasers and other energy-based devices to improve outcomes, speed healing, and minimize complications. Drawing on his surgical and aesthetic expertise, he stressed individualized pre- and post-procedure care.

He highlighted the benefits of early scar intervention, such as the use of the fractional ablative erbium laser two months post-op, and emphasized proper skin prep. In a 20,000-case Mohs dataset, chlorhexidine had the lowest infection rates, while hypochlorous acid was preferred near the eyes for its antimicrobial, non-stinging, periocular-safe profile.

Doctor Cohen described combining ablative and non-ablative fractional lasers, such as Halo®, to reduce downtime and improve luminosity. Post-procedure, he uses Revision's CMT Cream® to reduce heat and discomfort by acting on beta-endorphins and TRPV1 receptors. Heavier resurfacing is often paired with

platelet-derived growth factor, PRP, or exosomes to promote collagen and fibronectin synthesis.

To camouflage post-treatment redness, he recommends EltaMD UV® skin recovery red color correcting green-tinted mineral sunscreen with iron oxides and antioxidant complexes. After realizing so many of his laser patients wanted to camouflage post-procedure redness and expedite their return to work and social activities, he proposed tinting the sunscreen green to EltaMD which lead to the development of their product. He then did the only post-laser study on it to show its results. Persistent erythema or rosacea can benefit from pulsed dye laser plus Senté's heparan sulfate analog cream.

For hyperpigmentation prevention, for strict sun protection, he recommends sunscreens with high-zinc/titanium formulas and pigment-reducing agents like Revision THD® ascorbate or Alastin A-Luminate.® In cases of pigment loss, fractional laser-assisted delivery of bimatoprost can stimulate repigmentation.

He emphasized the importance of screening for *Herpes simplex* infection with prophylaxis when appropriate and giving patients clear wound care instructions to prevent complications from unsupervised product use.

CONCLUSIONS

The Skincare Education Symposium 2025 showcased the depth and innovation shaping modern dermatology. Each expert offered clinically relevant insights- from ingredient science to procedural care- that can be directly applied in practice. As the field of skin-care continues to grow, these presentations serve as a reminder that evidence-based education continue to be the foundation for exceptional patient care.

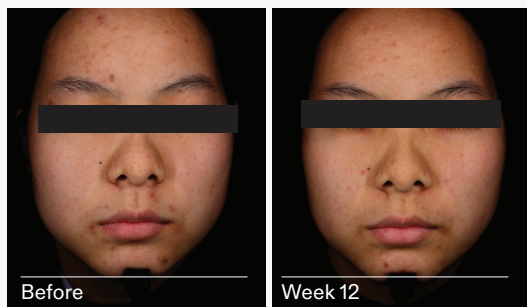
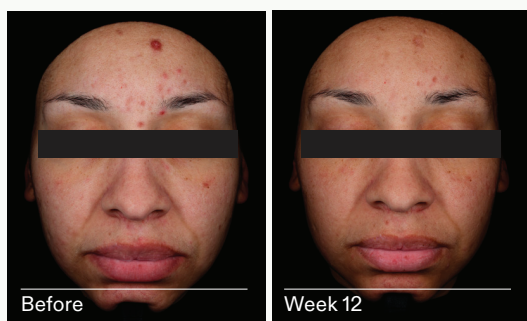
Table 12.

CATEGORY	KEY INGREDIENTS/TECH	FUNCTIONS/BENEFITS
Growth Factors	Pure PDGF (platelet-derived growth factor)	Stimulates collagen I, III, VI and fibronectin production; tissue regeneration
Neurocosmetics	Ingredients targeting keratinocyte-neuron communication	Reduces inflammation, soothes skin, modulates sensory response
Topical Anesthetics	Lidocaine, Tetracaine, Prilocaine, Benzocaine	Provides pain control; requires proper dosing to avoid toxicity
Skin Barrier + Recovery	AAComplex (3 amino acids), Ceramides, Centella Asiatica, Niacinamide	Hydration, barrier repair, redness reduction, safe for post-procedure use
Post-Procedure Regimen	EltaMD UV Skin Recovery + Moisturizers post-non-ablative laser	Reduces post-laser erythema and texture with high tolerability
Anti-Inflammatory Agents	Heparan Sulfate Analog (HSA)	Reduces IL-8 release, inflammation, erythema; boosts collagen/elastin
Pigment Modulators	Cysteamine + HSA	Improves tolerability of cysteamine for pigmentation concerns

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In a 12-week clinical study evaluating the efficacy of Nutrafol Clear Skin Nutraceutical in subjects with non-cystic acne (ages 18-50)¹:

85% showed improvement in IGA scores for acne severity.

87% showed improvement in non-inflammatory lesion count.

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These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

*According to IQVIA ProVoice survey for 12 months ending March 31, 2024.

1. Raymond I, et al. SKIN: J Cutan Med. 2024./Nutrafol. Data on file. 2023.

ORIGINAL CONTRIBUTION

Solid Nodules after Poly-L-Lactic Acid Injection: A study of 90 Patients

Fernanda A. Cavallieri, MD;¹ Patricia Harada;² Laila Klotz de Almeida Balassiano, MD;³ Natalia Baracat;⁴ Gabriela Munhoz, MD;³ Marcia Ramos-e-Silva, MD, PhD;⁵ Brazilian Study Group on Dermatologic Procedures and their Complications (BSGDPC)⁶

ABSTRACT

Collagen stimulators are used for facial rejuvenation, and adverse events after poly-L-lactic acid (PLLA) injection, a collagen stimulator used for more than 30 years, are relatively uncommon. Unfortunately, increase in their complications is observed recently, mainly because of their wide use by nonmedical personnel. This study presents 90 instances of adverse events related to the PLLA injection Rennova Elleva[®] given for aesthetic purposes on the face, neck, or other body parts. Delayed onset of nodules was observed in most instances. Ultrasound imaging performed in 43 patients revealed elongated, hypoechoic, and lobulated solid nodules in the subcutaneous tissue corresponding to the injected site. This report emphasizes importance of the routine ultrasound imaging for a more accurate diagnosis and treatment planning of clinical manifestations and complications resulting from PLLA injections. Histopathologic analysis also provides helpful information for understanding the pathophysiologic aspects of this unusual manifestation. (*SKINmed*. 2025;23:369–372)

An exponential increase in the number of complications related to minimally invasive aesthetic procedures, mainly with injectable products, has been observed recently.¹

Globally, Brazil is the second country with maximum aesthetic procedures, with the United States being the first. Unfortunately, Brazil also has a very high number of clinical manifestations and complications arising from these procedures, mainly if rendered by nonmedical personnel.

Poly-L-lactic acid (PLLA) is a common collagen biostimulator used globally for facial and body rejuvenation, and adverse events following its injection are relatively uncommon. This study presents 90 patients with manifestations and complications following

the PLLA injection, Rennova Elleva[®] injected on the face, neck, and other body parts.

MATERIALS AND METHODS

In all, 90 patients with palpable nodules, following the PLLA injection for aesthetic purposes, were selected. We collected medical history, dermatologic assessments, and skin ultrasound (US) performed with a high-frequency probe (>15 MHz) to classify complication types. Age, gender, anatomic area, early or delayed nodule formation, type of complications, and histopathologic and sonographic findings obtained are shown in Table 1.

In selected patients, the biopsied nodules were fixed in 10% formalin and stained with hematoxylin and eosin (H&E) and alcian

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blue for histopathologic analysis using both conventional light microscopy and polarized light microscopy.

RESULTS

Of the 90 patients selected, 84 were women, aged 32–74 years, and 6 men, aged 39–55 years. In all, 80 patients presented delayed onset of nodules (onset period >4 weeks), and 10 patients had early onset of nodules (onset period <4 weeks). Maximum nodules were on the neck, followed by the face. These were visible lumps, and some were painful (Figures 1 and 2).

A radiologist performed skin ultrasound in 43 patients, revealing elongated, hypoechoic, lobulated, predominantly homogeneous solid nodules. They were located in subcutaneous cell tissues,

with some presenting variable degrees of vascularization on color Doppler (Figures 3–5).

Histopathologic examination of 18 patients was performed with alcian blue; it demonstrated foreign body-type granulomas with



Figure 1. A woman developed delayed-onset nodules on the neck after a PLLA injection.



Figure 2. A woman developed delayed-onset nodules on the neck after a PLLA injection.

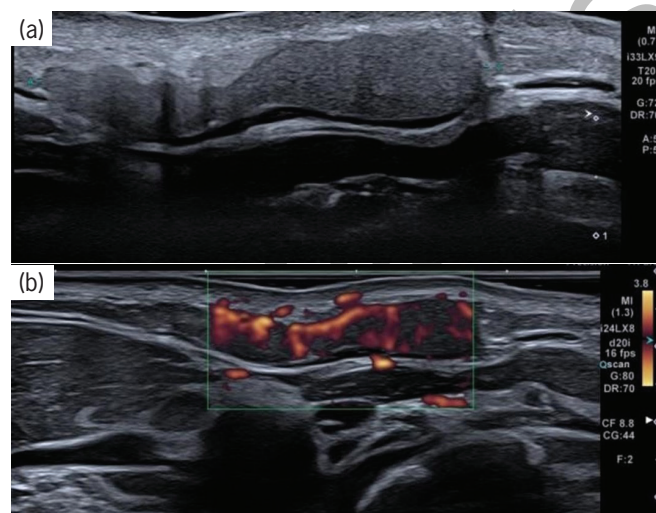


Figure 3. High-frequency B-mode ultrasound of the neck (transversal plane). The nodules are elongated, hypoechoic, and predominantly heterogeneous, with lobed margins, located at the subcutaneous cell tissue site. Maximum nodules depicted color Doppler vascularization; however, some depicted variable Doppler vascularization.

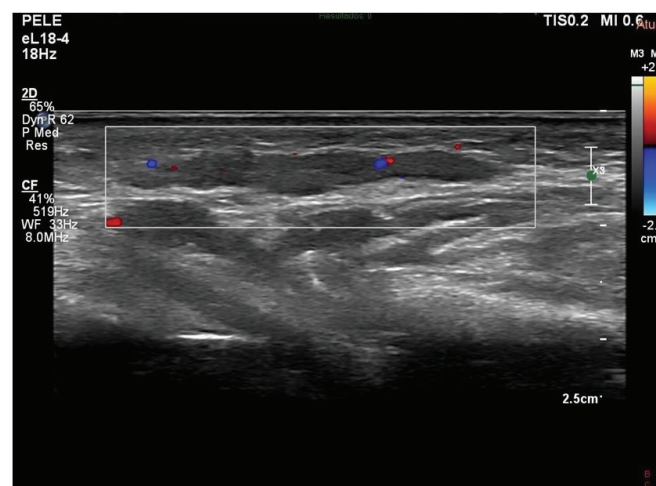


Figure 4. (a) High-frequency B-mode ultrasound of the neck (transversal plane). Nodules are elongated, hypoechoic, predominantly heterogeneous, with lobed margins, located at the subcutaneous cell tissue site, some with variable Doppler vascularization, the majority with Doppler vascularization. (b) High-frequency B-mode ultrasound of the neck (transversal plane). Nodules are elongated, hypoechoic, predominantly heterogeneous, with lobed margins, located at the subcutaneous cell tissue site, some with variable Doppler vascularization, the majority with Doppler vascularization.



Figure 5. High-frequency B-mode ultrasound of delayed-onset nodules, demonstrating solid, hypoechoic, oval, homogeneous, and well-defined margins, located at the site of subcutaneous cell tissue, with no flow on color Doppler.

a substantial number of foreign body giant cells, analyzed under polarized light.

DISCUSSION

Collagen biostimulators are increasingly used for facial rejuvenation. PLLA, a commonly used collagen biostimulator, has been used for more than 30 years and its manifestations and adverse events, although rare, may occur.^{2,3}

Currently, two brands of collagen biostimulators are utilized in Brazil: Sculptra®, a polymer with reticulated carboxymethyl cellulose, contains 150 mg of PLLA and 90 mg of sodium croscarmellose, and Rennova Elleva®, with 210 mg of PLLA and 132 mg of sodium carboxymethylcellulose.^{4,5} PLLA is in the form of a sterile lyophilized powder containing mannitol and microparticles having a diameter of 40–63 micrometers.^{4,5}

Delayed-onset nodules are a rare complication, most of which appear after 8–12 months of PLLA injection.^{2,3} Numerous factors related to the procedure, such as product dilution, application site, inappropriate technique, and irregular dispersion of particles because of ineffective post-procedure massage, contribute to adverse events.^{6–8} Another hypothesis is related to an exaggerated response to the product, inducing a change in inflammatory cascade, resulting in fibrosis.¹ According to a group of researchers, thinner skin areas, such as the neck, could be at a greater risk of nodule formation if high concentration of PLLA is used.^{9,10}

According to another study, numerous adverse reactions occur because of fillers, as maximum delayed-onset nodules are inflammatory or immune-mediated.¹¹ Some authors report that triggers,

such as respiratory tract infections, dental procedures, bacterial or viral systemic infections, vaccination, and facial trauma, can develop an inflammatory response to fillers.^{12,13} Late manifestations and adverse events can be an exacerbated pathologic inflammatory response, resulting in a nodular formation, mainly by excessive acquirement of fibroblasts.¹¹

Regarding the complications caused by PLLA Elleva® described in this report, only a single study described the ultrasound results of the injected product immediately after it was given to four patients.⁴ The same study also described 26 patients, whose inner arm was injected, with no delayed adverse events following a 90-day follow-up.⁵

Ultrasound with color Doppler has proved useful for diagnosing, identifying, and managing complications related to injectable aesthetic procedures, such as fillers and biostimulators.^{14,15} A few studies discussed the ultrasound aspect of PLLA, while others evaluated the complications arising from the product.^{16–19}

Of the 90 patients, 43 were evaluated in the United States and demonstrated multiple large solid hypoechoic nodules with oval and elongated shapes, with predominantly well-defined contours in subcutaneous cell tissues corresponding to the injected areas. Some of the nodules presented inner vascular flow with color Doppler. The echogenicity of the nodules resulting from high-concentration PLLA injection appeared hypoechoic, while the nodules because of low-concentration PLLA injection appeared isoechoic. Besides providing accurate information about complications arising from fillers, the ultrasound helps in guiding biopsies, and hyaluronidase and/or corticosteroid injections.^{15,16,19,20}

Histopathologic analysis of PLLA microspheres demonstrated the formation of foreign body granulomas. These may appear 6–24 months following the PLLA injection and may last for up to 5 years if left untreated.²¹

CONCLUSIONS

This study is scientifically relevant because it describes the first case series of 90 patients demonstrating complications with PLLA Elleva®. In addition, this is the first report to describe the ultrasound characteristics of nodules that developed as an adverse event of Rennova Elleva®. The authors reinforce the importance of new studies to provide more information about possible causes and risk factors of PLLA complications.

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ORIGINAL CONTRIBUTION

Validation of Natural Oils for Hair Loss Treatment as Promoted by TikTok Users

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ABSTRACT

This study evaluated the scientific validity of hair growth claims for natural oils promoted on TikTok, comparing frequently mentioned oils to evidence from peer-reviewed literature. The first 100 TikTok videos tagged “hair+growth+oil” were screened, with irrelevant or unavailable videos excluded. Eligible videos were analyzed for explicit claims about hair growth. Oils were classified as single ingredients or key components in multi-ingredient products. A systematic review was performed using PubMed searches with “[oil name]+hair+growth,” and evidence was evaluated using the Strength of Recommendation Taxonomy grading scale. Rosemary oil was the most mentioned oil and demonstrated evidence-based efficacy for androgenic alopecia, performing equivalent to 2% minoxidil in a randomized controlled trial. Preclinical studies supported peppermint oil’s hair growth potential when mixed with jojoba oil. Both tea tree and coconut oils demonstrated limited benefits for hair strength and inflammation, while argan, amla, fenugreek, and olive oils lacked supporting evidence. In all, 6% of videos were posted by physicians, and 38% contained financially biased content, such as advertisements. TikTok’s influence on health information emphasizes that dermatologists must engage in social media to counteract misinformation. Although rosemary oil establishes promise for treating androgenic alopecia, additional research is crucial to validate other claims and promote evidence-based practices. (*SKINmed*. 2025;23:373–379)

Social media has transformed access to information on a wide range of topics, including healthcare. For instance, frequent exposure to the COVID-19-related content on social media encouraged many users to adopt preventive measures during the pandemic.¹ Consequently, social media has become a significant platform for sharing health information, allowing healthcare professionals to educate the public, address misinformation, and raise awareness about public health concerns.²

Skincare is a popular subject among content creators and consumers across social media platforms. Platforms, such as YouTube, a video-sharing site, and Instagram, a video and photo-sharing app, are commonly used by dermatologists to promote healthy skin practices and to share new research on dermatology-related topics.³ TikTok, another prominent social media platform, has rapidly acquired more than 1 billion monthly active users, making it one of the fastest-growing social media networks.⁴ All the same,

the expansion of social media also raises concerns about sharing misinformation. A review of top dermatology-related TikTok posts revealed that most were created by individuals without professional dermatology expertise, often promoting potentially harmful at-home practices.⁵ In a separate analysis of 544 TikTok videos on dermatologic conditions, only 15.1% were posted by board-certified dermatologists.⁵

Amid this landscape, many content creators claim that “natural oils” (glyceride-based oils derived from plants or animals) offer benefits for various dermatologic conditions. While some of these claims are inaccurate or lack sufficient support, there is evidence in the medical literature suggesting that certain natural oils may reduce skin inflammation and help repair the natural skin barrier.⁶

In spite of keen interest in natural oils, few studies specifically examined the efficacy of TikTok-promoted products and practices related to hair growth. This review evaluates the claims made

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by TikTok content creators regarding the purported benefits of natural hair oils for promoting hair growth.

METHODS

The identification of the most frequently promoted hair growth oils on TikTok followed the protocol outlined in Figure 1. On March 1, 2022, reviewer (Christian Caddali) documented the first 100 TikTok posts generated by the search terms “hair+growth+oil.” To prevent curated search results influenced by prior user activity, a new account (@smdermwestern) was used in an incognito browser. Videos were filtered based on TikTok’s “top videos” sorting, and only English language videos were included.

Exclusion criteria were applied to omit duplicate videos, videos that were unavailable, videos that did not depict topical application of oil on the hair or scalp, or videos that mentioned any oil without further discussion. After exclusions, videos were eligible for analysis if they contained explicit claims that an oil or product promoted hair growth.

Content creators endorsed oils in two forms: as single-ingredient oils or as multi-ingredient products. An oil was categorized as a “natural oil” if it was promoted as a standalone ingredient or as the primary component in a product containing multiple ingredients.

To evaluate the scientific validity of these oils, a PubMed search was conducted for each of the top 10 oils using the query “[name of active ingredient]+hair+growth.” Reports lacking relevance to hair growth or missing an explanation of the mechanism of action were excluded (Figure 2). Claims made in the TikTok videos were then compared to findings from the literature.

In total, the PubMed search yielded 30 papers discussing oil use in relation to hair growth, from which only 10 full-text records were eligible for review. After further exclusion of papers with no relevant data on hair growth, six studies met the final inclusion criteria. These six papers were subsequently evaluated using the Strength of Recommendation Taxonomy (SORT) grading scale to assess evidence quality, quantity, and consistency.⁷

RESULTS

An analysis of the 81 TikTok accounts revealed that approximately 6% of content creators were verified physicians, with the remaining creators being non-physicians. Content creators had an average of 559,304 subscribers. On average, each video received 1,567,932 views, 6,015 shares, 158,133 likes, and 755 comments. Approximately, 38% of the TikTok videos demonstrated evidence of financial bias, with 24% containing advertisements.

The oils identified from the TikTok videos, as both individual oils and active ingredients, are organized by frequency in Table 1.

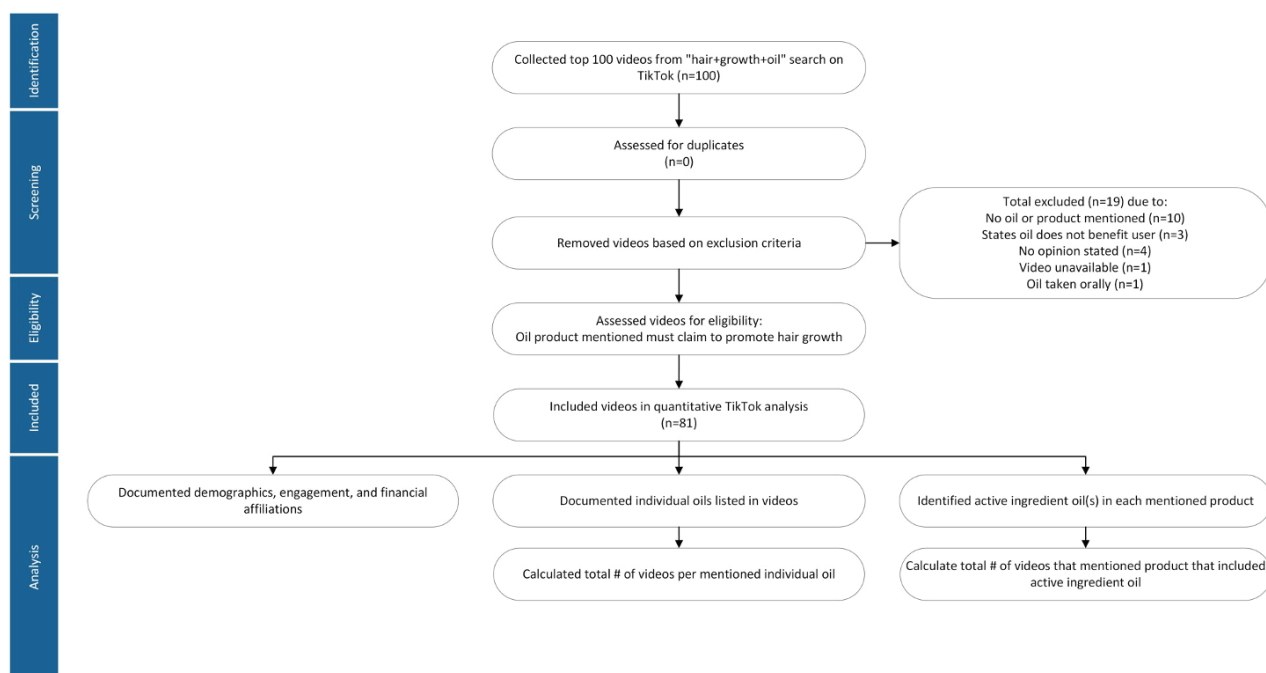


Figure 1. Flow chart of TikTok data extraction protocol for hair growth oils.

Table 1. Individual Oils and Active Ingredient Oils of Products Promoted for Hair Growth on TikTok

INDIVIDUAL OILS	ACTIVE INGREDIENT OILS
Rosemary (22)	Rosemary (15)
Castor (15)	Peppermint (14)
Peppermint (9)	Castor (13)
Olive (8)	Tea tree (12)
Coconut (7)	Coconut (10)
Argan, amla, fenugreek, and tea tree (4)	Olive (9)
Jobaba, grape seed, and pumpkin seed (3)	Almond, Grape seed, and sesame (7)
Avocado, blackseed, bhringraj, and lavender (2)	Fenugreek and sage (6)
Neem, caffeine, and aloe (1)	Blackseed and hempseed (5)
	Soybean (4)
	Basil, eucalyptus, pumpkin seed, sunflower, and wheat germ (3)
	Argan, avocado, cocoa butter, cornmint, eugenol, primrose, macadamia ternifolia seed, mustard, and thyme (2)
	Acerola, andiroba seed, blueberry seed, Brazil nut, caprylic/capric/myristic/stearic triglyceride, cedarwood, chickpea, coffee bean, copaiba resin, corn, flaxseed, frankincense, geranium, grapefruit, lentil, linalool, meadowfoam seed, mint, octyl palmitate, passion fruit seed, patchouli, pomegranate, and shea butter (1)

Note. Oils are listed from most to least number of videos. The number of videos per oil is indicated in parenthesis.

These oils were used to create the final “top 10 oils list” shown in Table 2, which includes rosemary, peppermint, jojoba, castor, tea tree, coconut, olive, argan, amla, and fenugreek oils. In terms of scientific support for hair growth, the literature review discovered evidence for rosemary, peppermint, jojoba, castor, tea tree, and coconut oils, while no paper supported the claims of hair growth for argan, amla, olive, or fenugreek oils.^{8–13} Among the reviewed oils, rosemary oil was the most frequently promoted one in videos as an individual oil ($n = 22$) and active ingredient oil ($n = 15$). Two

Table 2. Number of Eligible Peer-Reviewed Literature on PubMed for Top 10 Promoted Hair Growth Oils on TikTok

TOP 10 TIKTOK HAIR GROWTH OILS	TOTAL NUMBER OF REPORTS FOUND (N)	NUMBER OF ELIGIBLE REPORTS (N)
Rosemary oil	1	1
Peppermint oil	1	1
Jobaba oil	3	1
Castor oil	1	1
Tea tree oil	5	1
Coconut oil	4	1
Olive oil	15	0
Argan oil	0	0
Amla oil	0	0
Fenugreek oil	0	0
Total	30	6

papers, citing the same study, supported rosemary oil’s effectiveness in promoting hair growth.^{8,11}

Using the SORT grading scale, three of the six papers^{8,13,11} met the highest standards of patient-oriented evidence and strength of recommendation (1A rating). A summary of the included studies and their SORT ratings is provided in Figure 3. Rosemary oil received the strongest support, while jojoba and castor oils were the lowest rated ones (3C rating). Peppermint oil ranked in the mid-tier with a 2B rating on the SORT scale.

DISCUSSION OF TOP OILS

ROSEMARY OIL

Rosemary oil received the highest number of mentions on TikTok as both individual oil and active ingredient oil. Of the two supporting papers, one study—a single-blind randomized controlled trial involving 100 men with androgenic alopecia—determined rosemary oil to be as effective as treatment with 2% minoxidil ointment at 32 weeks.¹¹ This study noted improved treatment adherence with rosemary oil. Although no significant difference in hair growth was observed at 3 months (>0.3), both groups experienced a significant increase in hair count and a reduction in hair loss at 6 months, with twice-daily application ($n = 100$, $P < 0.05$).⁸ These findings suggest that rosemary oil, as frequently promoted on TikTok, may effectively support hair growth for androgenic

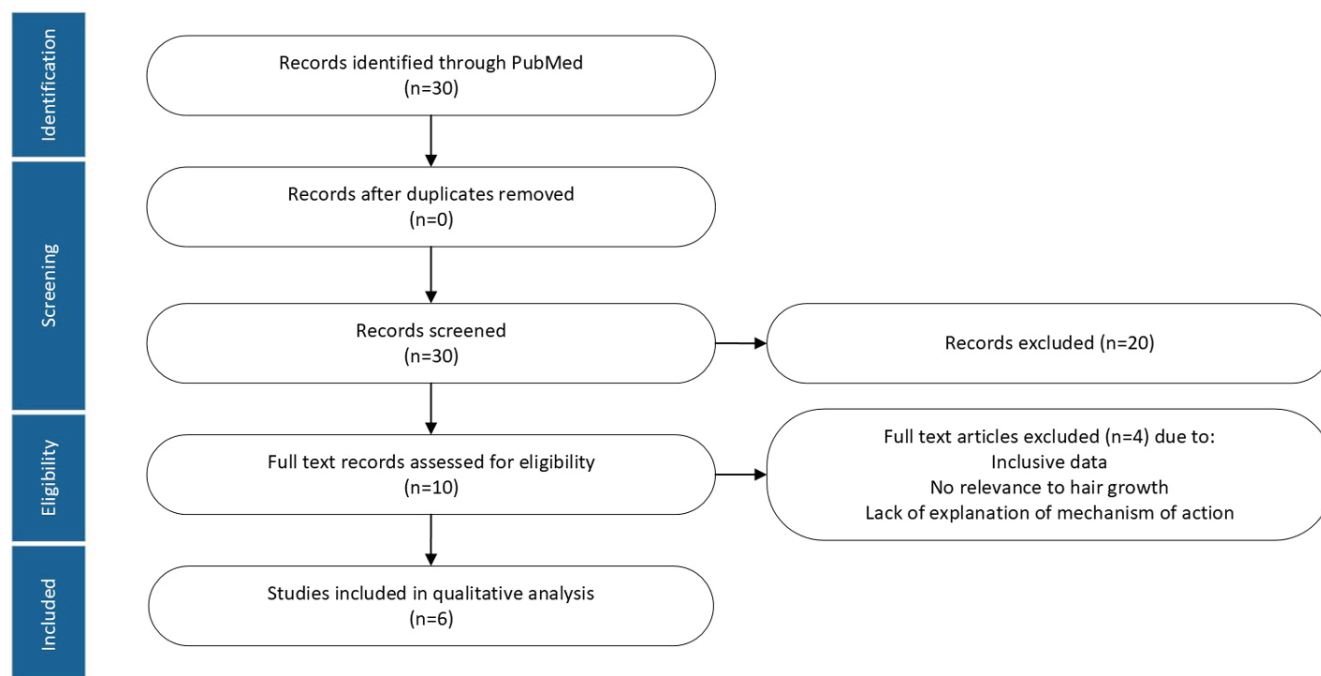


Figure 2. Article extraction PRISMA flow chart.

alopecia when used consistently for >6 months. Although these findings suggest hair growth for androgenic alopecia, the limitations of the study must be considered. The study's generalizability is constrained by its sample, which exclusively comprised men from Iran, aged 18–49 years. As a result, the findings may not be extrapolated to broader populations with diverse demographic, cultural, or geographic characteristics. The study's limited sample size restricts the diversity of the population, reducing statistical power and limiting the generalizability of the findings. Additionally, the study may not have considered control for external factors, such as diet, stress levels, or concurrent use of other hair products, influencing hair growth outcomes.

PEPPERMINT OIL

A randomized controlled trial was conducted on mice comparing jojoba oil, 3% peppermint oil diluted in jojoba oil, and 3% topical minoxidil. It was determined that peppermint oil in jojoba stimulated a 39% increase in hair growth by week 2, surpassing both minoxidil (30%) and jojoba oil alone (10%).⁹ By week 4, peppermint oil in jojoba demonstrated a 92% increase in hair growth, outperforming minoxidil (55%) and jojoba oil alone (23%). Peppermint oil increased dermal thickness by 81% ($p < 0.01$) and hair follicle counts by 307% ($p < 0.001$) relative to the jojoba oil vehicle control, with effects comparable to those observed with 3% minoxidil.⁹ These results indicate that peppermint oil, especially when diluted in jojoba, markedly promotes hair growth;

however, further investigation is needed to confirm its effectiveness as a standalone treatment.

The study was conducted on C57BL/6 mice, which may not fully replicate human hair growth patterns, limiting the direct application of the results to human subjects. In addition, the study lasted for only 4 weeks, which may not be sufficient to assess long-term efficacy and the potential adverse effects of peppermint oil for hair growth. Hair growth was primarily evaluated through visual assessment, histologic analysis, and biomarkers, such as alkaline phosphatase (ALP) and insulin-like growth factor 1 (IGF-1) expression. More objective quantitative methods, such as hair shaft diameter measurement or digital trichoscopy, could enhance functional reliability of peppermint oil.

JOJOBA OIL

A study evaluating jojoba oil's chemical and pharmaceutical uses discovered that it improved hair smoothness, minimized protein loss, and enhanced breakage resistance when added to thioglycolate-based straightening emulsions.¹⁰ The study may not have used objective and quantifiable methods to assess hair smoothness, protein loss, or breakage resistance, making it difficult to compare to other studies. Other ingredients in the thioglycolate-based emulsions may have influenced the observed effects, making it difficult to attribute benefits solely to jojoba oil. No studies, however, directly examined jojoba oil's effects on hair loss,

Hair oil	Article	Proposed Mechanism of Action (MOA)	Compared Treatments	Study Conclusion	
Rosemary	Rosemary oil vs minoxidil 2% for the treatment of androgenetic alopecia: a randomized comparative trial.	The spasmolytic activity of rosemary may enhance microcapillary perfusion and has been hypothesized to increase hair follicle blood supply, thereby being effective for the treatment of AGA.	Rosemary oil vs 2% minoxidil oil	After 3 months, no significant change was observed in the mean hair count in the rosemary or minoxidil group ($P>0.5$). Both groups experienced a significant increase in hair counts at month 6 endpoint compared with the baseline and month 3 endpoint (129.6 +51.2 in the rosemary and 140.7+38.5 in the minoxidil group, $P<0.5$). No significant difference was found between study groups regarding their hair counts either at month 3 or month 6 ($P>0.01$). No significant difference in the frequencies of dry hair, greasy hair, and dandruff was found in month 3 or 6 compared with baseline in both groups. Scalp itching was more frequent in the minoxidil group at both assessed endpoints ($P<0.05$)	IA
Peppermint	Peppermint Oil Promotes Hair Growth without Toxic Signs	The topical application of 3% PEO induces rapid anagen hair growth in telogen mouse skin by promoting the vascular conservation of hair dermal papilla.	3% Peppermint oil (PEO), 3% minoxidil (MXD), saline (SA), jojoba oil (JO)	Peppermint oil (PEO) grew more rapidly than saline and jojoba oil from week 2. At week 3, PEO promoted greater hair growth than MXD and much greater growth compared to SA and JO. At week 4, PEO growth was about 92% compared to minoxidil at about 55%. Hair follicle number of the PEO group was 473% and 218% greater than SA (saline) and JO (jojoba oil) group ($p<0.05$) at week 2. At week 4, PEO group 740% AND 307% more hair follicles ($p<0.001$).	IIB
Jojoba	Jojoba Oil: An Updated Comprehensive Review on Chemistry, Pharmaceutical Uses, and Toxicity.	The addition of jojoba oil to thioglycolate-based straightening emulsions benefited the hair fiber, allowing a little protein loss, protection to hair thread, and improved the breakage resistance.	None, comprehensive review	Jojoba oil is widely used in the pharmaceutical industry, especially in cosmetics, to restore the ordinary health of hair and skin. Jojoba cosmetic products currently on the market include the following: bath oil, body oil, cleansing creams, cleansing pads, cleansing scrubs, nourishing facial cream, facial oil, hair conditioner, hair oil, makeup remover, and shaving cream	IIIC
Castor	Castor Oil - The culprit of acute hair felting	The high viscosity of castor oil and long hair had contributed to sudden felting of hair. Combination of castor and coconut oil, when washed with warm water, resulted in electrostatic attraction of contiguous hair fibers. The higher viscosity of castor oil in long hair with warm water resulted in spontaneous felting of human hair.	Castor oil vs coconut oil	The high viscosity of castor oil and long hair had contributed to sudden felting of hair. This case occurred following the usage of castor oil for the first time in a healthy individual. Patient reported previously washing her hair with regular shampoo since childhood. While the hair was drying, the lower end twisted and curled like a bow in a ribbon. Pain present due to pressure effects on the hair roots. On examination, hair appeared as a compact hair mass resembling a bird's nest. Hair appeared dry, lusterless, and bleached. Mild scaling of scalp was noted. There was no foul smell and no evidence of parasitic infestation and pyoderma. Personal hygiene was adequate.	IIIC
Tea Tree & Olive	The Use of Natural Ingredients in the Treatment of Alopecias with an Emphasis on Central Centrifugal Cicatricial Alopecia: A Systematic Review.	Rosemary oil enhances microcapillary perfusion and offers anti-inflammatory properties. Azelaic acid affects the cornification process of the epidermal cells and appears to normalize the keratinization of cells in the skin and hair. It also appears to act as an antiandrogen by blocking the activity of 5 α -reductase. Pumpkin seed oil has been shown to block the action of 5 α -reductase and have anti-androgenic effects. Tea tree oil was found to have anti-inflammatory properties that offered additive effects when used in combination with diclofenac and minoxidil.	Case report comparing olive oil, pumpkin seed oil, tea tree oil, and minoxidil	Dexamethasone 0.27% lotion applied BID in combination with tar shampoo and olive oil daily showed improvement in reduction of scales and stabilization of hair shedding. 75% hair growth achieved by 3 months after therapy and no recurrence of alopecia at 1 year follow up. The combination of minoxidil, diclofenac, tea tree oil was superior to minoxidil alone in a 32-week pilot double blind randomized, placebo study. In the study of pumpkin seed oil, 75 male patients with androgenic alopecia received 400 mg of PSO per day or a placebo for 24 weeks Self-rated improvement score and self-rated satisfaction scores in the PSO-treated group were higher than in the placebo group ($P=0.013$ and 0.003). The PSO-treated group had more hair after treatment than at baseline relative to in the placebo group ($p<0.001$). Mean hair count increases of 40% were observed in PSO-treated men at 24 weeks	IA
Coconut Oil	Coconut, Castor, and Argan Oil for Hair in Skin of Color Patients: A Systematic Review	Coconut oil leads to hair growth by protecting hair shaft from mechanical stress. Castor oil leads to hair growth and increases hair shaft luster. Argan oil leads to hair growth and protects the hair shaft from damage.	Systematic review	Coconut oil was found to weakly increase dermal papilla cells, density, and length of hair follicles, and size and number of hair bulbs in one study. In a RCT of women ages 20-30, hair breakage index scores were improved by 41.8% 16 weeks after daily use of coconut oil directly applied to the scalp. Coconut oil was found to improve brittle hair and hair infestation but has limited evidence on hair growth improvement. Castor oil was found to have weak evidence of improvement on hair growth or treating infestation and, little evidence was found in hair quality improvement by castor oil. Argan oil was found to have no significant support in the literature to improve hair growth, quality, or infestation.	IA

Figure 3. Summary of papers for top 10 oils.

indicating that further research is warranted to explore its role in promoting hair growth, although it is effectively used as a carrier oil in hair-promoting agents, as depicted in other studies.¹⁴

CASTOR OIL

A case report involving a 20-year-old healthy woman in South India described scalp hair matting following the application of castor oil mixed with coconut oil. This effect was attributed to the high viscosity of castor oil and electrostatic attraction when exposed to warm water, leading to hair felting. While this highlights the potential adverse outcome, our literature review discovered no substantial evidence supporting castor oil as an effective agent for hair growth. In spite of frequent promotion on TikTok, no peer-reviewed studies were identified that validated its role in stimulating hair growth, contradicting many claims made by content creators.

TEA TREE OIL

Tea tree oil is known for its antimicrobial and anti-inflammatory properties, which may be helpful in lessening certain

inflammatory skin conditions.¹¹ A 32-week double blind, randomized, placebo-controlled trial evaluated a microemulsion containing minoxidil, diclofenac, and tea tree oil, which demonstrated a 75–79% increase in hair growth, compared to a 37–41% increase in hair growth with minoxidil alone ($P<0.001\%$).¹¹ The contribution of tea tree oil to these results is, however, unclear, as the observed effect may be largely attributable to minoxidil and diclofenac, rather than tea tree oil itself. Notably, there are no randomized controlled trials evaluating tea tree oil in isolation as a hair growth treatment; therefore, while this study suggests the potential synergistic benefits in combination therapies, there is insufficient evidence to support tea tree oil as an effective stand-alone treatment to reduce hair loss.

COCONUT OIL

A systematic review on coconut oil discovered that while it strengthens the hair and prevents breakage, its role in hair growth remains limited.¹³ A randomized controlled trial evaluating daily application of coconut oil for 16 weeks reported a 41.8% improvement in hair breakage scores ($P<0.05$), suggesting its ability to

protect the hair from mechanical damage.¹³ In addition, *in vitro* studies comparing mineral oil, sunflower oil, and coconut oil concluded that coconut oil uniquely reduced protein loss and improved hair shaft integrity, potentially because of its lauric acid content, which penetrates the hair shaft more effectively than other oils;¹⁵ however, the evidence supporting coconut oil's role in promoting hair growth is decrepit. A few studies that suggest the potential benefits often involve confounding variables, such as coconut oil being used in combination with other ingredients known to promote hair growth, including *Polygonum multiflorum* and corticosteroids.¹³ Although some animal studies have suggested that coconut oil may increase hair follicle density, these findings are not validated in large human trials. In spite of their popularity and frequent endorsement on TikTok, no studies were determined linking olive, argan, alma, or fenugreek oils with hair growth, suggesting that these oils lack efficacy in treating hair loss.

DISCUSSION ON SOCIAL MEDIA IMPLICATIONS

Social media has played a vital role in providing health-related information, especially when access to in-person healthcare services was restricted, such as during the COVID-19 pandemic;^{16,17} however, it is crucial for users to exercise caution and prioritize evidence-based guidance from qualified healthcare professionals. This study highlights the potential for misinformation when claims made by unqualified social media users lack support from data-driven literature.⁵

Among the oils frequently promoted on TikTok, rosemary oil had the strongest scientific support for its potential role in hair growth, specifically for androgenic alopecia;⁸ however, this evidence is limited by the study's small sample size and lack of diverse representation. Peppermint oil demonstrated significant hair growth effects in animal models, but no human trials confirmed its efficacy as a standalone treatment.⁹ Jojoba oil is studied for its role in improving hair smoothness and breakage resistance, rather than directly promoting hair growth.¹⁰ Tea tree oil was included in a study that demonstrated increased hair growth; however, its contribution is unclear because of the simultaneous use of minoxidil and diclofenac.¹¹ Castor oil, in spite of widespread promotion, lacked scientific support and was primarily associated with an adverse event (acute hair matting).¹² Coconut oil demonstrated protective effects on hair strength and reduced protein loss but had weak evidence supporting claims that it stimulates hair growth.¹³

Patients can benefit greatly from information provided directly by board-certified dermatologists, who offer scientifically validated advice. In addition, dermatologists can have professional benefits in creating inline content, as it positively impacts their online

ratings on platforms such as HealthGrades.com.^{18,19} By actively engaging on social media, dermatologists can address common topics, fill gaps in available information, and focus in the areas that are underrepresented in digital content. Furthermore, they can use their platforms to expose prevalent misinformation, such as the unsupported claims around important oils for hair growth.

Given the high proportion of engagement observed in the videos analyzed in this study (e.g., views, likes, shares, and comments), dermatologists are inclined to produce content that satisfies the evident demand of viewers for authentic information on hair growth, a shared responsibility exists between viewers and content creators. Viewers should critically evaluate the health information they consume, while content creators should ensure that their claims are supported by reliable evidence.

CONCLUSIONS

Our analysis indicates that while TikTok is a popular platform for sharing health information, the products and practices promoted by its content creators are not always supported by scientific evidence.⁵ We conducted a comprehensive literature review on the most frequently discussed oils related to hair growth on TikTok, including rosemary, peppermint, jojoba, castor, tea tree, coconut, olive, argan, amla, and fenugreek oils. The search revealed no clinical evidence supporting the use of olive, argan, amla, or fenugreek oils for hair growth.^{8–13}

Of the oils frequently mentioned on TikTok, only rosemary, peppermint, jojoba, castor, tea tree, and coconut oils had scientific studies assessing their effects. Rosemary oil demonstrated the strongest evidence, with potential benefits for hair growth when used for at least 6 months in patients with androgenic alopecia;⁸ however, the study supporting its effectiveness was limited by its small sample size and lack of long-term follow-up. Although peppermint oil demonstrated promising results in animal studies, human trials are needed to confirm its efficacy.⁹ Jojoba oil was primarily studied for its ability to improve hair strength and protect against breakage, rather than for hair growth.¹⁰ The study supporting tea tree oil involved its use in combination with minoxidil and diclofenac, making its independent role in hair growth uncertain.¹¹ Coconut oil was established to enhance hair strength and reduce protein loss, but there was insufficient evidence to support claims that it directly promotes hair growth.¹³ In addition, castor oil was not supported by scientific literature and was primarily associated with an adverse effect of hair matting.¹²

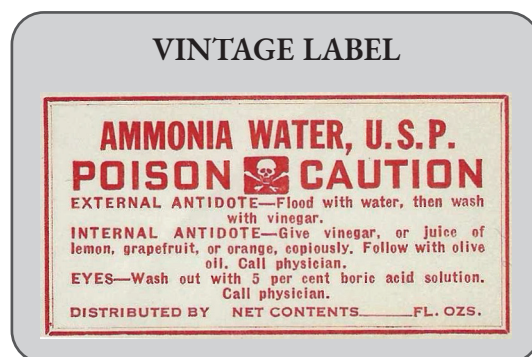
Although rosemary oil establishes some promise for treating androgenic alopecia in men, it is important to recognize that hair loss is a multifaceted condition with various underlying causes.⁸ The findings in this paper may not apply to all forms of hair loss,

such as telogen effluvium, alopecia areata, or cicatricial alopecia. This study is limited by the complex disposition of hair loss, which may result from diverse conditions, each with distinct causes and mechanisms. As such, treatments effective for one type of hair loss may not work for other types, highlighting the importance of a personalized approach to hair loss treatment.⁸

Additional limitations of this study include insufficient randomized controlled trials, large population studies, and systematic reviews specific to natural oils used for hair growth. Furthermore, few controlled studies had adequate control groups, and many used combinations of natural oils, complicating the isolation of individual effects.⁸⁻¹³ To substantiate the claims frequently made on TikTok regarding isolated natural oils, further research is needed. The future studies should aim to address these gaps, focusing on treatment efficacy across diverse populations and different hair loss types.

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ORIGINAL ARTICLE

Prevalence of Androgenetic alopecia in male population of Kashmir Valley: A Hospital-based study from North India

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ABSTRACT

Androgenetic alopecia (AGA) is a patterned hair loss occurring because of systemic androgen and genetic factors. It is the most common cause of hair loss in both genders. Limited scientific focus is discovered on non-genetic inheritance, and the data on environmental factors that may aggravate AGA in men are sparse. In this study, we examined 1,260 men attending the Dermatology outpatient department between July 2019 and January 2020. All men and their attendants attending Dermatology OPD were examined and assessed for prevalence of AGA. The diagnosis of AGA was based on clinical examination, and severity was graded according to the Norwood–Hamilton scale. Age was identified as the most significant variable influencing prevalence of AGA in our cohort. Prevalence of AGA was 69.04%, with a significant correlation between the prevalence and severity of AGA and age ($P = 0.0001$). The highest prevalence was observed in the age group of 45–55 years (88.88%), while the lowest prevalence was in the age group of 15–25 years (60.9%). Our findings indicated that the prevalence of AGA in this population was significantly higher than that reported in past studies comprising Asian and Caucasian populations. Additional research is warranted to understand the specific factors contributing to these findings and to develop targeted interventions for affected individuals. (*SKINmed*. 2025;23:380–384)

Androgenetic alopecia (AGA) is the most common type of hair loss,¹ characterized by progressive thinning of scalp hair and reduced hair density and diameter.² AGA in men presents with a typical pattern of bitemporal and frontal recession of hairline, or vertex thinning, which gradually extends anteriorly.^{3–6} The prevalence of AGA increases with age, from 30% in men in their 30s to 50% in men in their 50s. A limited scientific focus is discovered regarding non-genetic inheritance, and the data on environmental factors that may aggravate AGA in men are sparse.

The onset age of AGA varies significantly: 40% of individuals begin to develop male pattern baldness (MPB) at the age of 18–29 years, 24% in their 30s, 3% in their 40s, 5% in their 50s, 9% in their 60s, 2% in their 70s, and in 1% at the age of ≥80 years.⁷ The incidence and prevalence of AGA vary with age and ethnicity. For example, AGA affects approximately 50–70% of Caucasian men and 40% of Caucasian women by the age of 70, while the incidence is lower in Chinese, Japanese, and African Americans.⁸

Androgenetic alopecia causes significant psychologic impact, with anxiety and depression commonly associated with the condition.⁹ The onset of AGA typically occurs at the age of 30–40 years, although recent studies have demonstrated that it begins as early as just after puberty.^{5–7} AGA in patients aged ≤35 years is termed as early-onset AGA, and clinical studies have linked it to the factors, such as overweight (BMI > 25 kg/m²), metabolic syndrome, insulin resistance, cardiovascular diseases, and a family history of AGA. Two studies demonstrated that susceptibility, age at onset, and MPB and its progression were influenced genetically. Hair follicles on the scalp undergo a transformation from active, growth phase of hair cycle (anagen) and dormant or resting phase of hair growth cycle (telogen) to long rest and short growth cycles coupled with progressive miniaturization of follicles.¹⁰ The *EDA2R* gene that encodes androgen receptor is proposed to be associated with AGA.¹¹

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METHODOLOGY

STUDY POPULATION

The present cross-sectional study was conducted at our outpatient Department of Dermatology, Government Medical College Anantnag, India, between July 1, 2019 and January 1, 2020. In all, 1,260 men, aged 15–55 years, were examined by an experienced dermatologist working in the hospital. All participants provided verbal informed consent for the use of their data for research purposes on the condition of anonymity. A comprehensive examination of the entire scalp was performed for examination of hair. All subjects were screened for clinical manifestations of AGA, and severity of AGA was graded using the Norwood–Hamilton scale.

Inclusion criteria

1. Men
2. Age: >15 years and <55 years
3. Hair loss because of AGA

Exclusion criteria

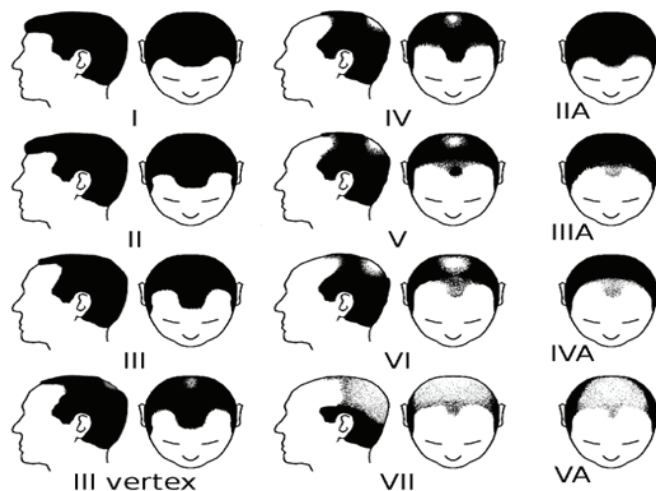
1. Women
2. Age: <15 years and >55 years
3. Hair loss because of reasons other than AGA

DIAGNOSIS OF AGA

Androgenetic alopecia was diagnosed based on recession of the frontal temporal hairline and thinning of hair over the frontal and/or vertex areas. The severity of AGA at the patient's first visit to the clinic was assessed by a senior dermatologist.

CLASSIFICATION OF AGA

The diagnosis of AGA was based on participants' pattern of hair loss. The degree of hair loss was assessed by an experienced dermatologist using the Norwood–Hamilton classification, a standard scheme with good test–retest reliability.⁴ Pattern of AGA among men with insignificant or cosmetically significant MPB was recorded according to Norwood–Hamilton classification as type III (including type III vertex and type IIIa), type IV (including IVa), type V (including Va), type VI, or type VII. The prevalence of more advanced degrees of alopecia characterized by a remaining horseshoe fringe of hair (Norwood types V, Va, VI, and VII) was also estimated.



Hamilton-Norwood grading of male AGA. I, no hair loss; II, inverted "v" frontal recession; III, bitemporal recession; IV, deep frontotemporal with some midfrontal and some vertical thinning; V, Further frontotemporal with marked vertical thinning; VI, Confluence occurs; VII, enlargement of both bald areas with only a band of occipital hair remaining.

STATISTICAL ANALYSIS

The age-specific prevalence of AGA was expressed as percentage prevalence. The recorded data were compiled and entered in Microsoft Excel and exported to the data editor of SPSS version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean $\pm$ SD and categorical variables were summarized as frequencies and proportions. Graphically, the data were presented by bar and pie diagrams. Chi-squared test was utilized for comparing the prevalence of AGA in various age groups; $P > 0.05$ was considered statistically significant.

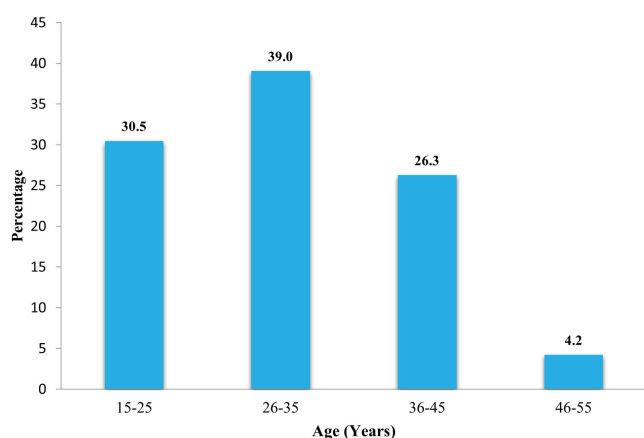
RESULTS

A total of 1,260 consecutive subjects in the age group of 15–55 years, with a mean age of 32.7 ± 6.93 years (15–55 years), were examined for any evidence of AGA. The age distribution of our study population was as follows: 384 (30.5%) subjects were in the age group of 15–25 years, 492 (39.0%) were in the age group of 26–35 years, 331 (26.3%) subjects were in the age group of 36–45 years, and 54 (4.2%) subjects were in the age group of 46–55 years. Statistically, the prevalence of AGA was significant and directly proportional to the increase in age (Table 1 and Figure 1). In the cohort, 873 subjects (69.3%) had AGA, while 387 subjects (30.7%) had no alopecia (Table 2 and Figure 2). The most common pattern of alopecia was type II (40.7%), followed by type III (19.4%) and then type I (12.5%) (Table 3 and Figure 3). The prevalence of AGA was 57.6% in the age group of 15–25 years; 69.5% in the

Table 1. Age Distribution of the Study Population

AGE (YEARS)	NUMBER	PERCENTAGE
15–25	384	30.5
26–35	492	39.0
36–45	331	26.3
46–55	53	4.2
Total	1,260	100

Note. Mean $\pm$ SD (range) = 32.7 ± 6.93 (15–55 years).

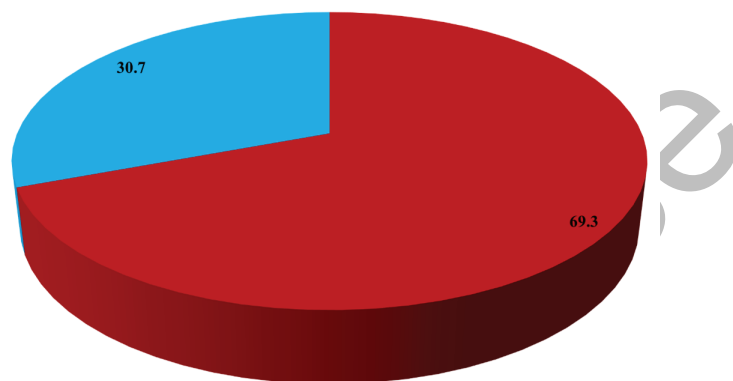
**Figure 1.** Age distribution of the study patients.**Table 2. Prevalence of Androgenic Alopecia in the Study Population**

AGA	NUMBER	PERCENTAGE
Present	873	69.3
Absent	387	30.7
Total	1,260	100

age group of 26–35 years; 80.1% in age group of 36–45 years; and 84.9% in the age group of 46–55 years (Chi-square = 48.98; $P < 0.001$).

DISCUSSION

Very limited studies, especially in the Indian context, aimed at studying the prevalence of AGA. While our study specifically focused on the prevalence of AGA in men from northern India, a study conducted on the prevalence of AGA in men from South India, concluded that 1,005 subjects (58%) aged 30–50 years had AGA. The severity of AGA increased with age, with 12.9%

**Figure 2.** Prevalence of androgenic alopecia (AGA) in the study population.**Table 3. Distribution as Androgenic Alopecia according to AGA Grading**

AGA TYPE	NUMBER	PERCENTAGE
I	109	12.5
II	355	40.7
III, including III vertex	169	19.4
IV, including IV vertex	66	7.6
V	48	5.5
VI	72	8.2
VII	54	6.2
Total	873	100

having types IV–VI and 44.1% having types I–III;¹² however, to the best of our knowledge, no comparative data from North India were determined. The current study aimed to bridge this gap by examining the prevalence of AGA and its correlation with age. Grading of AGA in men, performed by using Norwood–Hamilton Classification, demonstrated the overall prevalence of 69.04%.⁴ The prevalence of AGA also varied with different races, with higher prevalence observed in Caucasian and Indians and lesser in Chinese and Korean populations. Studies conducted by various researchers reported the AGA prevalence of 50–55%,^{13–16} although our study reported a higher AGA prevalence, possibly because our subjects were in the age group of 15–55 years. The severity of AGA increased with age, as evidenced by the prevalence of 84.9% in the age group of 46–55 years. This pattern was

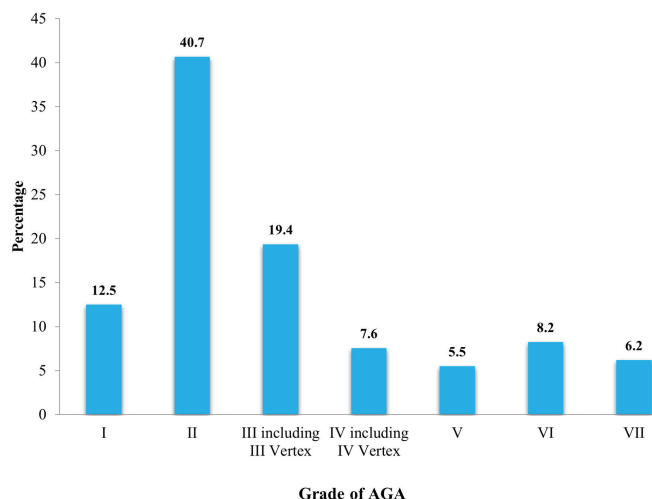


Figure 3. Distribution as per androgenic alopecia (AGA) grading.

Table 4. Prevalence of Androgenic Alopecia According to Age in the Study Population

AGE (YEARS)	TOTAL NUMBER	N	AGA PREVALENCE (%)
15–25	384	221	57.6
26–35	492	342	69.5
36–45	331	265	80.1
46–55	53	45	84.9
Total	1,260	873	69.3

Note. Chi-square = 48.98; $P < 0.001$ (statistically significant).

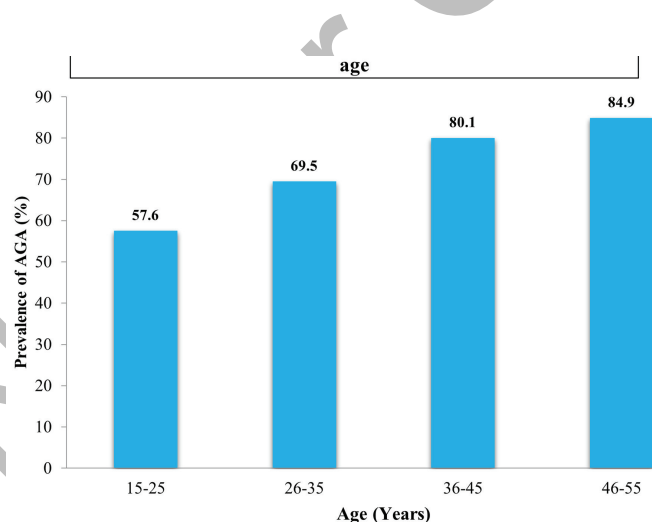


Figure 4. Prevalence of androgenic alopecia (AGA) according to age.

consistent with the findings of other studies, where both prevalence and severity of AGA increased with age. Besides genetic factors, various environmental and lifestyle factors contribute to variation in AGA prevalence. Environmental factors, such as climate, ultraviolet (UV) exposure, air and water quality (hard vs soft water), and dietary patterns have a role in maintaining hair health. Lifestyle factors, such as stress levels, smoking, alcohol consumption, and hair care practices, can also contribute to AGA progression. Additionally, cultural and occupational differences as well as urbanization-related stress levels that vary with regions, potentially affect the progression of AGA.

CONCLUSIONS

Our study reveals that the prevalence of AGA in men is significantly higher than the findings of other studies. Definite regional differences exist in pattern of hair loss and prevalence of AGA. In our study, frontal hair loss was more common than vertex hair loss. This regional variation in hair loss patterns emphasizes the importance of studying AGA across different ethnic and geographic groups. In addition, higher grades of baldness were observed at a younger age, with 2.85% of individuals aged 15–45 years exhibiting type VII AGA, indicating a substantial prevalence of severe hair loss at early stages of life. Compared to other studies conducted in Asia, our study, being the first epidemiologic study conducted in the Kashmiri population, revealed a higher prevalence of AGA. This suggests a potentially higher prevalence of AGA within Kashmir's ethnic population. Additional research is warranted to understand specific factors contributing to these findings and to develop targeted interventions for affected individuals.

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ORIGINAL CONTRIBUTION

Snejina Vassileva, MD, PhD, Section Editor

Acute Generalized Exanthematous Pustulosis: A Study of 20 Patients

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ABSTRACT

Acute generalized exanthematous pustulosis (AGEP) is a rare cutaneous adverse drug reaction marked by the sudden emergence of numerous non-follicular sterile pustules on edematous, erythematous skin, often accompanied by systemic clinical manifestations. The aim of the present study was to determine the clinical characteristics, causes, and outcomes of AGEP in a Tunisian tertiary hospital. A retrospective analysis was performed on all AGEP patients over a period of 13 years from 2008 to 2020. In all, 20 patients with the definite diagnosis of AGEP were identified. The median age of the patients was 48 years. Six patients (30%) had oral mucosal involvement. Fever was reported in 16 patients (80%), leukocytosis ($>10,000/\text{mL}$) in 14 patients (70%), increased levels of neutrophils ($>7,000/\text{mL}$) in 13 patients (65%), and eosinophilia in 12 patients (60%). A skin biopsy was performed for all patients that revealed characteristic features of AGEP. According to the European study of Severe Cutaneous Adverse Reactions (EuroSCAR) scoring system, all patients had a score of >8 . The most frequently implicated drugs were paracetamol in six patients and terbinafine in five patients, followed by carbamazepine in two patients. The median time from drug exposure to the development of AGEP was 4 days. AGEP patients in our study were characterized by high mucosal involvement and prevalence of eosinophilia. The clinical presentation was benign in all patients with no systemic involvement. (*SKINmed*. 2025;23:385–388)

Acute generalized exanthematous pustulosis (AGEP) is a rare cutaneous adverse drug reaction marked by the sudden emergence of numerous non-follicular sterile pustules on edematous, erythematous skin, often accompanied by systemic clinical manifestations.¹ Typically, the clinical trajectory of AGEP is self-limiting. Our study aimed to elucidate the clinical characteristics, etiologic factors, and outcomes of AGEP patients at a tertiary hospital in Tunisia.

METHODS

A retrospective analysis was conducted comprising all patients diagnosed with AGEP over a period of 13 years, from 2008 to 2020, at the Dermatology Department of Hospital Habib Thameur, Tunis, Tunisia.

RESULTS

In all, 20 patients, comprising 16 women and four men, with a median age of 48 years, had the confirmed diagnosis of AGEP. Among these patients, three had a history of psoriasis, while three had experienced prior episodes of AGEP. Common clinical presentations included acute eruptions characterized by widespread pin-sized non-follicular pustules on an erythematous, edematous base, primarily localized at large folds, trunk, and limbs (Figures 1A–1C). Facial edema was noted in two patients, with pruritus reported in eight patients (40%). Oral mucosal involvement occurred in six patients (30%), with two patients having tongue erosion and four patients had cheilitis. Systemic clinical manifestations were discovered, with fever reported in 16 patients (80%), leukocytosis ($>10,000/\text{mL}$) in 14 patients (70%), increased neutrophil levels ($>7,000/\text{mL}$) in 13 patients (65%), and eosinophilia

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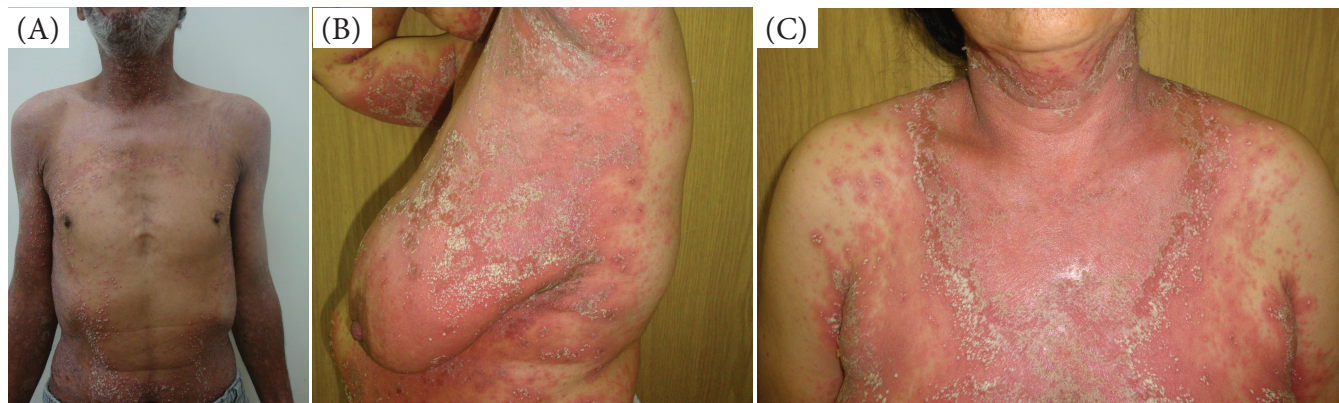


Figure 1. (a) Multiple non-follicular pustules present on edematous erythema across the trunk and skin folds. (b) Extensive non-follicular pustules on edematous erythema in the axillary region. (c) Widespread non-follicular pustules observed on edematous erythema spanning the trunk.

in 12 patients (60%). Cervical lymphadenopathy was observed in two patients, and mild hepatocellular involvement, including cholestasis, observed in four patients, although without associated hepatic cytolysis. Renal dysfunction, lung involvement, or hemodynamic stability was not reported. The majority of patients (95%) required hospitalization for comprehensive management.

Skin biopsy was performed for all patients, exhibiting characteristic features of AGEP (Figures 2A and 2B). In addition all patients scored >8 according to the European study of Severe Cutaneous Adverse Reactions (EuroSCAR) scoring system. The most frequently implicated drugs were paracetamol in six patients and terbinafine in five patients, followed by carbamazepine in two patients. Individual patients were induced by clobazam, pyostacine, famotidine, hydroxyzine, a topical cream containing

mephenesin, and spider bite. The median period from drug exposure to the evolution of AGEP was 4 days (ranging from 1 to 21 days).

Pharmacovigilance surveys were conducted in 16 patients, confirming the involvement of culprit drug in the onset of AGEP. All patients achieved complete recovery within 15 days, with treatment primarily comprising topical steroids and disinfectant solutions, although two patients required systemic steroids. The post-recovery epicutaneous testing (patch test) was performed in two patients. Three patients experienced a recurrence of pustular eruptions within 1 month, accompanied by fever and parakeratosis. The second biopsy revealed increased mitotic figures, Munro microabscess, and tortuous, dilated blood vessels, leading to the diagnosis of pustular psoriasis, subsequently treated with acitretin.

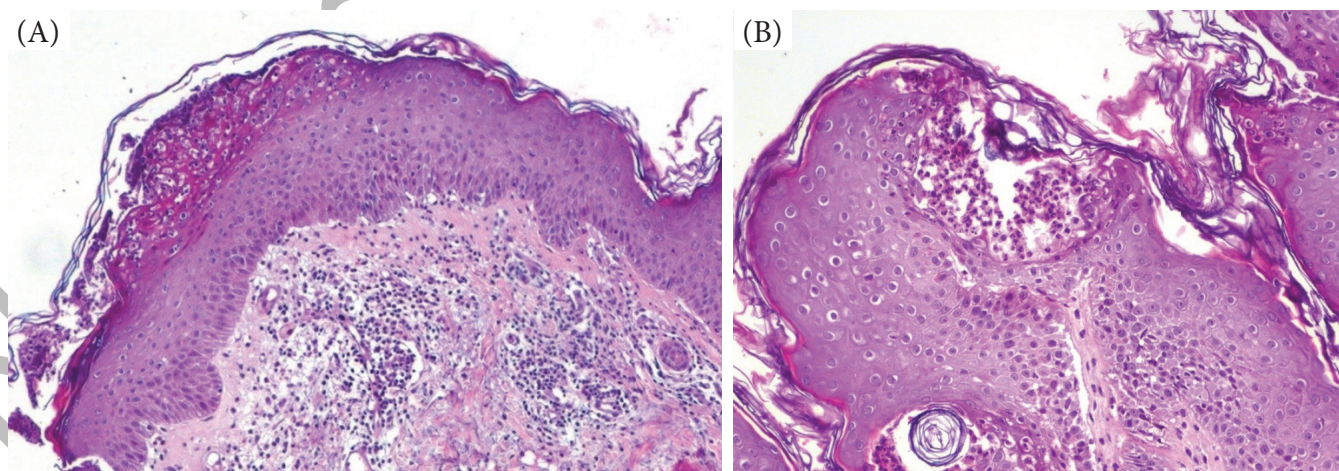


Figure 2. (a) Multi-locular intraepidermal pustule with a moderate perivascular infiltrate of lymphocytes and eosinophils observed in superficial dermis (hematoxylin and eosin [H&E], magnification $\times 100$). (b) Intraepidermal pustules containing neutrophils and eosinophils noted (H&E $\times 100$).

DISCUSSION

The majority of AGEF patients in the current study were women (78%), with a median onset age of 48 years, consistent with the findings of the literature.^{2,3} Notably, a personal history of psoriasis was present in three patients (15%), aligning with the data reported in other studies.^{2,3} Although generalized pustular psoriasis (GPP) was more prevalent in this study, patients with psoriasis appeared to have a higher susceptibility to AGEF, compared to healthy individuals, although the exact mechanism remained elusive.⁴ Acute presentation characterized by fever and pustulosis, accompanying rapid resolution upon withdrawal of the offending drug, supported the diagnosis of AGEF, rather than pustular psoriasis.³ It is imperative, therefore, not to automatically classify every acute pustular eruption in psoriasis patients as pustular psoriasis.

A typical clinical manifestation of AGEF, characterized by the diffused distribution of multiple sterile, non-follicular pustules on an erythematous background, was observed in all the patients of the present study, with an acute onset occurring within a median of 4 days. Past studies have documented typical lesions, such as targetoid, purpuric, vesiculobullous lesions, or even Nikolsky sign in AGEF.^{2,5} Mucosal involvement, noted in 20%–25% of patients in the literature, was relatively high in our study (31% of patients), *albeit* limited to the oral mucosa, consistent with prior reports.³ Patients with diffused mucosal involvement are associated with a higher risk of mortality.⁶ In addition, facial edema and less frequently localized lymphadenopathy, observed in two patients, are commonly reported in AGEF.²

Peripheral eosinophilia in AGEF is attributed to the expression of interleukin-5 (IL-5) by infiltrating T helper cells. While the literature reports eosinophilia in approximately 30% of AGEF patients,^{3,7} the present study observed it in 60% of patients. These varied features of AGEF sometimes pose challenges in differentiating it from other severe cutaneous drug reactions, such as toxic epidermal necrolysis (TEN) or drug reaction with eosinophilia and systemic symptoms (DRESS).

Acute systemic involvement, such as pneumonia, hepatocellular dysfunction, and renal failure, is reported in 17% of patients.⁸ A favorable outcome with no mortality, however, is considered standard;^{2,3,8,9} none of our patients presented acute manifestations, even those experiencing recurrence of AGEF following the accidental reintroduction of the same culprit drug. Some studies have reported mortality proportion of around 10%–20%, primarily associated with comorbidities and secondary infections in patients with poor general health;⁹ however, as mentioned earlier, there are reported instances of acute AGEF exhibiting overlapping features of DRESS and TEN.⁸

More than 90% of AGEF patients are drug-induced, differing from the past studies, where paracetamol-induced AGEF was infrequent.^{1,10} In our study, however, paracetamol emerged as the most commonly implicated drug in AGEF (30% of occurrences), potentially because of its widespread usage as an over-the-counter (OTC) medication in our country. Terbinafine was the second most common culprit drug, with a notable increase in terbinafine-induced AGEF in recent years, possibly linked to its frequent use, particularly for onychomycosis. The latency period with terbinafine in our study was up to 21 days, making it the longest among various antifungals.¹¹ The reasons for this extended latency period remained unclear, although the absence of prior sensitization could provide a reasonable explanation.¹¹

Episodes of AGEF induced by topical agents are relatively rare. In our study, we observed one patient with AGEF induced by a topical treatment containing mephenesin, used for analgesic and anti-inflammatory effects in relieving muscular pain. A positive cutaneous patch test confirmed the association. This was the second reported occurrence of AGEF induced by mephenesin in the literature.¹² Notably, this drug is withdrawn from the market because of its limited benefits and significant risks, including severe adverse effects, such as anaphylactic shock and addiction.¹² While hydroxyzine-induced AGEF is not reported in the past, occurrence of AGEF induced by cetirizine, the main metabolite of hydroxyzine, is documented.^{13,14} This cross-reaction is attributed to their shared chemical node, piperazine.¹⁴ Famotidine, included in the list of offending drugs, was reported in only one patient with a severe clinical presentation resembling TEN.¹⁵

Although relatively uncommon, there have been few well-documented evidences of AGEF induced by spider bites. The exact mechanism underlying spider bite-induced AGEF remains unknown; however, it is theorized that spider venom, containing sphingomyelinase, could induce the release of various inflammatory mediators, thereby triggering AGEF.¹⁶ Our study included a lone patient with AGEF secondary to spider bite.

Discontinuation of the offending drug is the initial step in AGEF management, typically leading to lessening of manifestations within few days.¹⁷ Supportive treatments, including topical steroids to relieve inflammation and pruritus, beside disinfectant solutions to prevent pustular phase infections, are also beneficial. The efficacy of systemic steroids remains uncertain.¹⁷ Rehydrating lotions may be prescribed during the desquamative phase. Withdrawal of offending drug and topical corticosteroid therapy were the most commonly administered treatments in the present study, resulting in rapid resolution within 15 days. Three patients without a history of psoriasis, however, developed GPP following AGEF resolution. Similar to GPP, some AGEF

patients are associated with mutations in the *IL36RN* (interleukin 36 receptor antagonist) gene, resulting in uncontrolled IL-36 signaling and increased production of pro-inflammatory cytokines chemokines.¹⁸⁻²⁰ Recent studies have demonstrated elevated expression of heterodimeric protein cytokine IL-17A/F, potent inducers of tissue inflammation and neutrophil recruitment by innate immune cells, such as neutrophils and mast cells, in both AGEF and GPP.²¹ Mutations in protein antagonist IL-36Ra and elevated IL-17 expression have crucial roles in the pathogenesis of both AGEF and GPP, accounting for their similar clinical presentations, and the onset of GPP following AGEF in the present patients.

CONCLUSIONS

AGEF patients in the present study exhibited high mucosal involvement and prevalence of eosinophilia, with benign clinical presentations but no systemic involvement. Most culprit drugs are commonly associated with AGEF; however, we also identified unusual triggers, such as famotidine and topical mephensin. While AGEF is self-limiting, recurrence of similar pustular eruptions without intake of drug must be considered, particularly pustular psoriasis, which shares a similar pathogenesis.

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PHOTO CAPSULE

Snejina Vassileva, MD, PhD, Section Editor

Purpura Fulminans and Symmetric Peripheral Gangrene

Ankita Srivastava, MD; Sanjiv Choudhary, PhD

A 16-year-old girl was brought to the emergency room with a history of fever, abdominal pain, and diarrhea for the past 1 week, with difficulty in breathing and decreased responsiveness for a day. Her examination revealed severe tachycardia and hypotension. There were gangrenous changes in the extremities (Figure 1). A provisional diagnosis of septic shock with purpura fulminans (PF) and symmetric peripheral gangrene (SPG) was arrived at. Patient was immediately started broad-spectrum antibiotics and inotropic support; however, the patient succumbed to her illness on the next day.

DISCUSSION

Both PF and SPG are cutaneous manifestations of disseminated intravascular coagulation (DIC). These entities are regarded as a spectrum with a common pathomechanism of disturbed procoagulant–anticoagulant balance and microthrombosis.¹ PF results from intravascular thrombosis within cutaneous microvasculature leading to hemorrhagic infarction of the skin.² SPG is clinically characterized by symmetric distal ischemic damage leading to gangrene, which commonly affects the extremities. If necrosis

predominantly affects the acral sites in a bilaterally symmetric manner and leads to gangrene, it is labeled as SPG. If non-acral cutaneous necrosis is also present, it is termed as PF. There is a considerable clinical and pathophysiologic overlap between these two entities.^{1–3}

The etiology of SPG and PF is variable and includes infective and noninfective causes.^{1,4,5} The pathogenesis revolves around disturbed procoagulant–anticoagulant balance secondary to circulatory shock. Other contributory factors include acute ischemic hepatitis, hepatic cirrhosis, and administration of colloids, all of which result in depletion of natural anticoagulant factors, finally leading to peripheral microthrombosis.³

SPG must be suspected clinically if a patient presents with shock and acral gangrene with palpable peripheral pulses.¹ Various investigations that help to establish the diagnosis include a complete blood count, coagulation profile, D-dimer test, fibrin degradation products, protein C level, antithrombin level, serum lactate, skin biopsy, and arterial doppler. In addition, the liver and renal function tests, as well as appropriate cultures, should be taken to rule out sepsis.^{1,3,5}

Management of this condition requires a multidisciplinary approach and includes both medical and surgical interventions.^{1,3} Prognosis is poor with high rates of mortality and limb amputations in survivors.^{1,4} Various therapeutic options include unfractionated heparin, low molecular weight heparin, antithrombin III and protein C concentrates, fresh frozen plasma, and plasma exchange.^{1,3} In addition, treatment of shock and sepsis is essential. Surgical interventions include escharotomy, fasciotomy, debridement of nonviable tissue, amputation, and skin grafting.¹ As irreversible microvascular thrombosis may occur quickly, often it may be too late to intervene with therapeutic benefit; hence, treatment approaches must be directed toward prevention by identifying the patients at risk and instituting appropriate therapy at the earliest.³



Figure 1. Purpuric lesions accompanying dry gangrene of lower limbs in both legs.

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CONCLUSIONS

Etiopathogenesis of SPG and PF is centered on thrombosis in cutaneous microvasculature. These are life-threatening complications of DIC with a high mortality and morbidity. Early identification and institution of appropriate therapy is important to prevent devastating consequences.

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PERILS OF DERMATOPATHOLOGY

W. Clark Lambert, MD, PhD, Section Editor

The Importance of Knowing Basic Biology in Making Critical Diagnoses II: Nuances of Infectious and Infesting Organisms—New Observations

Spandana Maddukuri, BS;¹ Katrice M. Karanfilian, BS;¹ Muriel W. Lambert, PhD;^{2,3}
Marcus L. Elias, BS¹; Sara Behbahani, MS;¹ Albert Alhatem, MD;^{1,2} W. Clark Lambert, MD, PhD¹⁻³

The devil is in the details.—Anonymous

PATIENT 1: BED BUG

An 84-year-old woman developed papulosquamous skin lesions on her arms and legs over a period of 4 months. A biopsy performed by another dermatopathology laboratory demonstrated positive for scabies; however, a series of topical treatments (permethrin etc.) had no effect on the patient's condition, and other patients in the same nursing home were discovered to have similar lesions. The case report was submitted to one of the authors (W. Clark Lambert) for consultation (Figure 1). Disruption was observed on the surface, beneath which an area

in the mid-dermis demonstrated necrosis and liquefaction of the tissue. These changes were characteristics of a reaction because of an arthropod bite and were deeper than changes typically observed because of scabies. The consultation diagnosis of an arthropod bite reaction was made, probably because of bed bugs (in the United States, either *Cimex lectularius* or *Cimex hemipterus*). The nursing home was fumigated for eradication of bed bugs. The patient and all others in her environment experienced regression of lesions post-fumigation. Figure 2 shows a typical lesion because of bed bug bites. Bed bugs can be identified because they are extremely flat. Figure 3 shows an example of the arthropod.

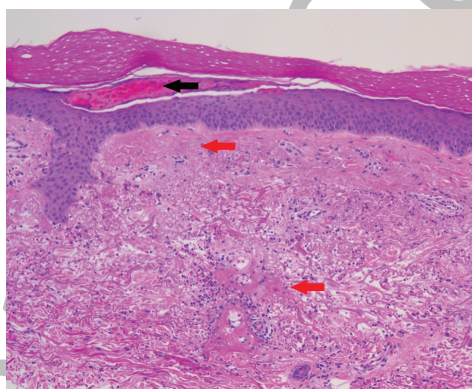


Figure 1. Patient 1: Bed bug bite. Note superficial changes (black arrow) as well as liquefactive degeneration of proteinaceous structures in the mid-dermis (red arrows) (hematoxylin and eosin stain, magnification $\times 155$).



Figure 2. Linear lesions on the skin suggestive of a bed bug bite reaction.

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Figure 3. Patient 1: Bed bug, the *Cimicidae* species (no stain used, magnification $\times 40$).

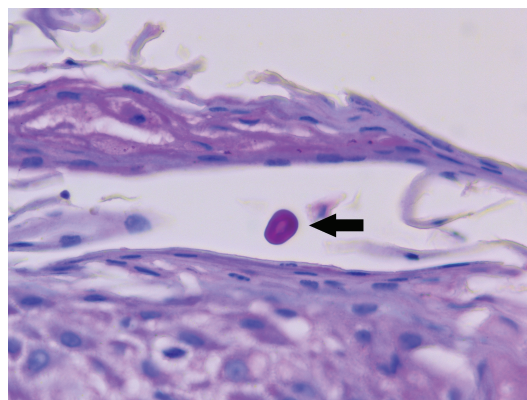


Figure 4. Patient 2: Scabies ovum (black arrow) (Periodic acid-Schiff [PAS] stain, magnification $\times 980$).

Bed bug bites appear as erythematous edematous papules that appear singly, grouped, or diffused, depending on the amount of accessible skin. The bites often occur in a linear pattern, as the bugs probe multiple sites looking for a suitable blood vessel to feed upon.¹ Pruritus is a result of the bite and the host response to the proteins injected into the skin.² A robust host response to the bite produces a bulla.² Although histologic observations of bed bug bites are rare, vacuolar degeneration at dermal-epidermal and perivascular infiltration is described in the deeper portion of the dermis. Often, lymphocytes and eosinophils associated with erythrocyte extravasation are observed.³ Liquefactive degeneration of proteinaceous structures because of the action of secretions of the organism is observed.

PATIENT 2: SCABIES

A 77-year-old African-American man experienced pruritic tract-like interdigital lesions on both hands. Several other patients in his nursing home had experienced similar lesions. A biopsy performed on normal-appearing skin, 2 mm proximal to the proximal end of the tract, revealed a scabies ovum (Figure 4) and the mite (Figure 5).

Scabies is an intensely pruritic disease that presents as erythematous papules or nodules with linear burrows in flexural areas and interdigital web spaces. It is caused by the feminine mite *Sarcoptes scabiei*, which burrows into the stratum corneum after mating.¹ The epidermis exhibits acanthosis and parakeratosis with dense eosinophilic dermal infiltrate whereas the dermis exhibits superficial perivascular and sometimes diffused infiltrate of lymphocytes and sometimes neutrophils.⁴ Notably, the mid and deep portions of the dermis are relatively free of pathology.

Scabies is spread through close contact with an infested individual. Sexual transmission is also common in adults.⁵ The diagnosis

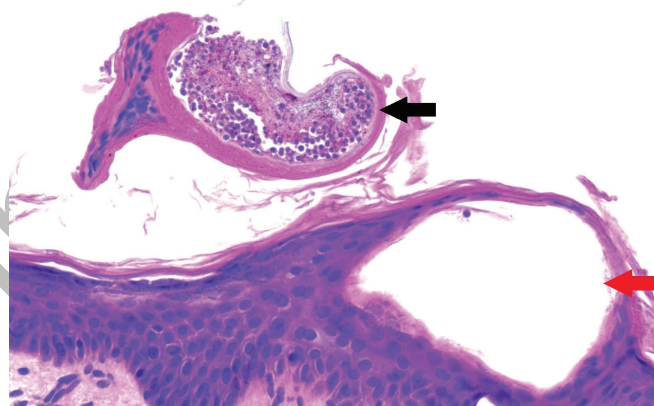


Figure 5. Patient 2: Scabies. Note the organism (black arrows) and the location in which it is normally located in the stratum corneum (red arrow) (hematoxylin and eosin stain, magnification $\times 310$).

is made by identifying mites, eggs, or feces in keratotic debris from a burrow on the patient's skin.⁶ The organism secretes one or more elements that suppress inflammation in its direct environment. Treatment is permethrin 5% cream applied for 8–12 hours and repeated a week later.⁷ Two doses of oral ivermectin taken at a gap of 2 weeks is used as an alternative treatment.⁷

PATIENT 3: CUTANEOUS LARVA MIGRANS

A 34-year-old woman noted a serpentine lesion on the instep of her sole 3 days after returning from Barbados, where she had walked barefoot on the beach for many hours. The lesion was asymptomatic and clinically did not depict inflammation. A biopsy performed led to the diagnosis of cutaneous larva migrans.

Cutaneous larva migrans is commonly caused by hookworms *Ancylostoma braziliense* and *Ancylostoma caninum*. Ova of

helminths are excreted in animal feces, which subsequently penetrate human skin through soil or sand. The hookworm invades the skin, but it lacks a secreted collagenase enzyme required to penetrate the basement membrane and is trapped in the epidermis.¹ This results in serpiginous erythema and pruritus because of a hypersensitivity reaction in the host.⁸ Biopsies are rarely performed, but when diagnostic, establish the organism situated just above the basement membrane. Laboratory findings of the infection include peripheral eosinophilia and elevated serum immunoglobulin E (IgE).⁹ Tracts are most commonly found on the feet, followed by the thighs and legs. Although cutaneous larva migrans is a self-limited disease that resolves within 2–3 months, treatment, often desired by patients, consists of a single dose of ivermectin.⁹

Notably, the infestation in scabies is limited to the stratum corneum and subjacent tissue. This is in marked contrast to cutaneous larva migrans (CLM), in which the worm is detected immediately above the basement membrane of the epidermis. CLM, a parasitic skin infection, is caused by an animal, especially dog, or hookworm larvae, which infests patients' skin lying or walking barefoot on the beach, particularly in the Caribbean Islands. The

worm is unable to penetrate the basement membrane in humans, and thus is unable to complete its life cycle, which involves the gastrointestinal tract (GIT) and seeding of immature mites in the environment, as in dogs. Often the tract of the organism, rather than the organism itself, is all that is seen histologically.

PATIENT 4: ARACHNID

A 73-year-old Caucasian woman noted a large spider dangling in front of her while riding on a cog railway through a jungle in Brazil. Later, she experienced an intensely painful lesion on the nape. The pain persisted for over a week and spread to surrounding skin in a dependent manner. A biopsy was performed, revealing an arachnid bite reaction (Figures 6 and 7).

Reaction to spider venom depends on factors, such as species of the spider, amount and site of initial bite, duration of bite, and health of patient. Findings include pain and swelling because of necrosis at the site. Systemic manifestations include fever and hypertension; however, respiratory distress, pulmonary edema, and renal dysfunction are observed in severe reactions.¹⁰ The immune system may release histamines in response to the bite, which causes many of the systemic manifestations; thus, treatment with antihistamines significantly lessens clinical manifestations.

CONCLUSIONS

Liquefactive degeneration of proteinaceous structures because of secretions of the *Cimicade* species is used in the diagnosis of a bed bug infection. It is observed that in scabies, the mid- and deep dermis do not exhibit pathologic findings. The diagnosis and treatment of infections and infestations depend on the precise knowledge of organisms and their effects.

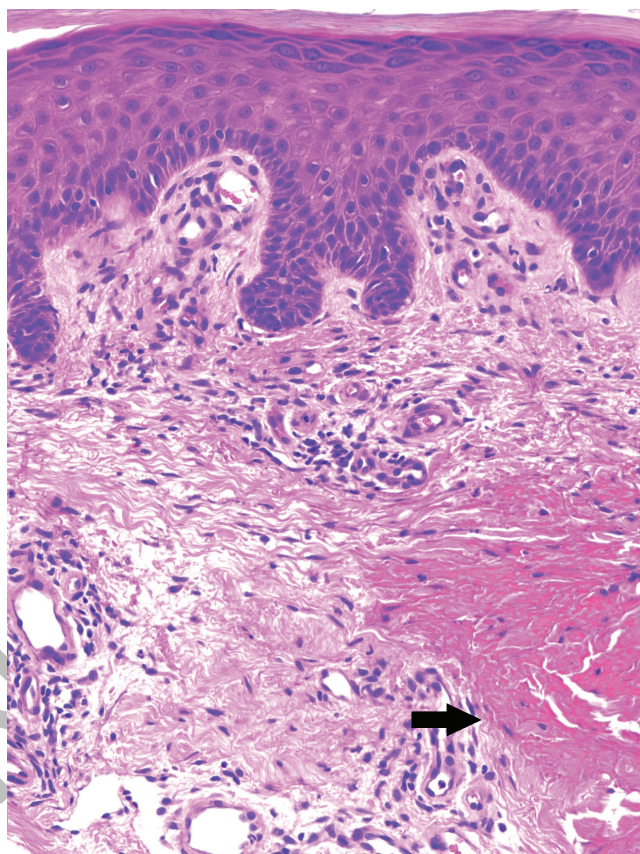


Figure 6. Patient 4: Reaction because of arachnid bite (black arrow) (hematoxylin and eosin stain, magnification $\times 310$).

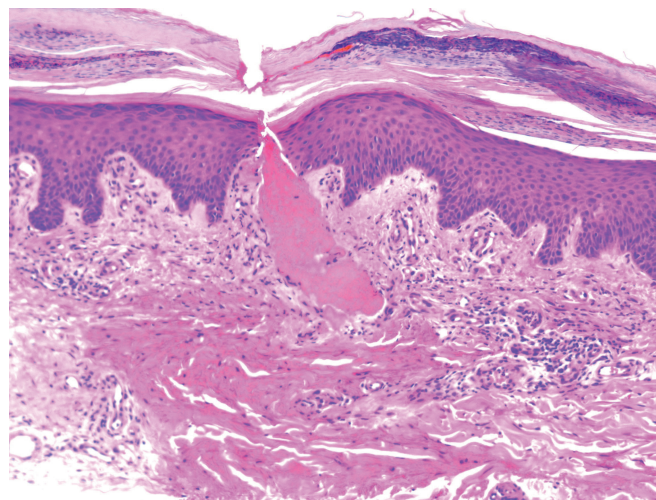
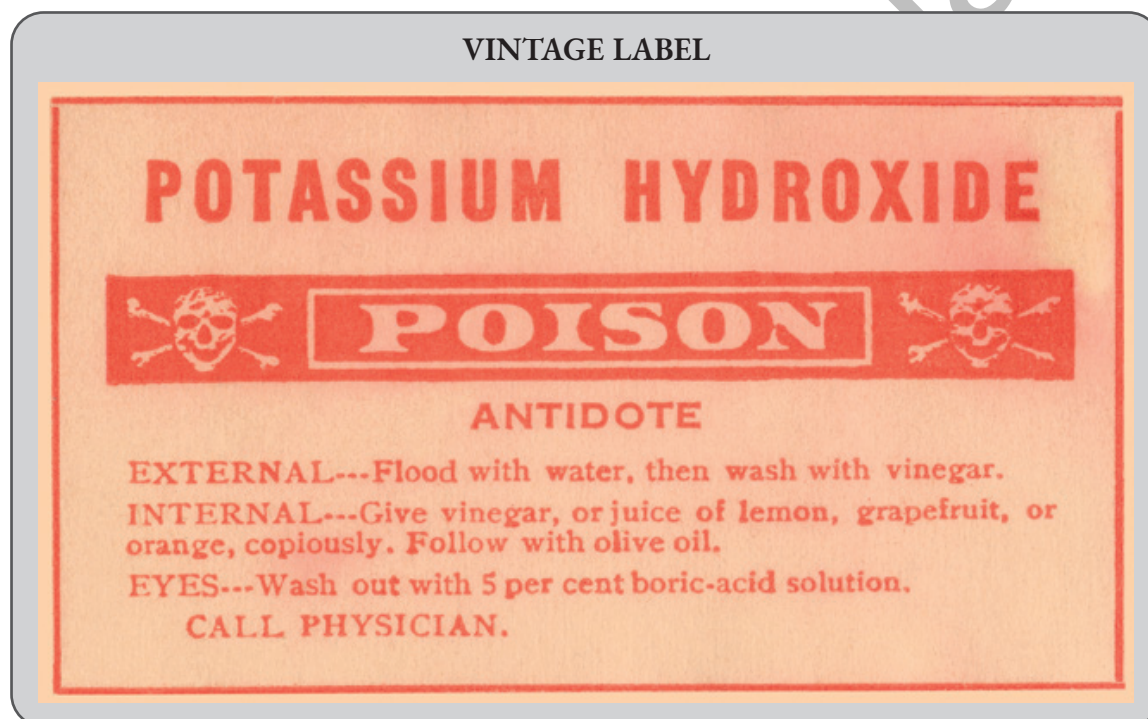


Figure 7. Patient 4: Reaction because of arachnid bites (hematoxylin and eosin stain, magnification $\times 155$).

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NEW THERAPY UPDATE

William Abramovits, MD; Aditya K. Gupta, MD, PhD, FRCPC, Section Editors

SOFDRA (Sofpironium) Topical Gel, 12.45%, for the Treatment of Primary Axillary Hyperhidrosis

Aditya K. Gupta, MD, PhD;^{1,2} Avantika Mann, PhD;² Kimberly Vincent, MD;³
William Abramovits, MD;^{4,5,6} SOFDRA (sofpironium) topical gel,
SOFDRA is the trademark of Botanix SB Inc., Initial US Approval: 2024

ABSTRACT

SOFDRA (sofpironium) topical gel 12.45%, has been approved recently for the treatment of primary axillary hyperhidrosis (PAH) in adult and pediatric subjects, aged ≥ 9 years. Sofpironium reduces excessive sweating by competitively inhibiting acetylcholine receptors on sweat glands, thereby decreasing neural stimulation and sweat production. The efficacy of sofpironium was assessed in two randomized, double-blind, multi-center, vehicle-controlled trials, CARDIGAN 1 (NCT03836287, n = 350) and CARDIGAN 2 (NCT03948646, n = 351). Subjects were randomized to receive either sofpironium or placebo, applied once daily at bedtime for 6 weeks, followed by a 2-week post-treatment period. The primary efficacy endpoints included the percentage of subjects achieving a ≥ 2 -point amelioration in the Hyperhidrosis Disease Severity Measure-Axillary, 7-item scale score (HDSM-Ax-7), and the change in gravimetric sweat production (GSP) from baseline to day 43. In CARDIGAN 1, HDSM-Ax-7 for sofpironium versus vehicle was 49% (84/172) versus 29% (51/177). In CARDIGAN 2, HDSM-Ax-7 for sofpironium versus vehicle was 64% (114/178) versus 48% (81/169). Sofpironium topical gel 12.45%, demonstrated higher efficacy in both trials, compared to vehicle. The US Food and Drug Administration approved sofpironium topical gel 12.45%, in 2024. (*SKINmed*. 2025;23:396–398)

Hyperhidrosis leads to excessive sweat production, beyond what is required to sustain thermal regulation. It can be classified as primary or secondary. Primary hyperhidrosis (PH) is a chronic condition that affects the axillae, palms, soles, craniofacial area, or any other body site. The most common type of PH is primary axillary hyperhidrosis (PAH), characterized by excessive sweating in the armpits/underarms. It significantly affects patients' quality of life because of the need for frequent change of clothes or taking of showers.^{1,2}

Nonsurgical treatment options include antiperspirants (e.g., aluminium salt solutions) and anticholinergic agents. Among more invasive treatments, botulinum-toxin A injection is a key second-line therapy. For patients who do not respond to these therapies, destruction of the sweat glands (via microwave or surgery) may be attempted.³

Anticholinergic agents, such as glycopyrrolate and oxybutynin, work by inhibiting neuronal transduction in the sweat glands. Glycopyrronium bromide (GB) cream formulations (0.5%–4%) and glycopyrronium cloth, 2.4% (QBREXA), have also demonstrated amelioration in reducing sweat production.⁴ Topical anticholinergics effective in PAH include topical oxybutynin 3% and 10%, umecclidinium 1.85% cutaneous solution, and sofpironium.³

Sofpironium is a structural analogue of glycopyrrolate. It is a non-invasive, convenient, safe, and effective treatment whose initial target indication is PAH.⁵ The US Food and Drug Administration (US FDA) approved it in 2024 for the treatment of PAH in subjects aged ≥ 9 years.⁶

INDICATIONS, USAGE, AND ADMINISTRATION

Sofpironium is recommended for the treatment of PAH in adults and pediatric patients aged ≥ 9 years.

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It is recommended not to shave armpits at least 8 hours prior to applying SOFDRA and not to take shower at least 30 minutes prior to its application. It must be applied to clean and dry skin once a day at bedtime by using a single pump actuation per underarm and allowing it to dry completely for 5 minutes prior to dressing.⁶

MECHANISM OF ACTION

Sofpironium reduces the rate of sweating by preventing the stimulation of acetylcholine receptors located on the sweat glands. It acts as a competitive inhibitor of acetylcholine receptors.⁶

CLINICAL STUDIES

Two randomized, double-blind, multi-center, vehicle-controlled trials, CARDIGAN 1 and CARDIGAN 2 (NCT03836287 and NCT03948646) were conducted to study the efficacy of sofpiroonium topical gel for the treatment of PAH in adults and pediatric patients aged ≥ 9 years. CARDIGAN 1 enrolled 350 adult subjects, and CARDIGAN 2 enrolled 351 pediatric subjects, aged ≥ 10 years.^{6,7}

Subjects were enrolled if they had manifestations of PAH for the past 6 months, produced at least 50 mg of sweat in each underarm, with a combined total of minimum 150-mg sweat for more than 5 minutes, and had the Hyperhidrosis Disease Severity Measure-Axillary, 7-item scale score (HDSM-Ax-7) of ≥ 3 . The HDSM-Ax-7 scale score was calculated by averaging seven items, with the score ranging from 0 to 4, where a higher score indicated increased severity of underarm sweating.^{6,7}

Subjects who were aged ≥ 12 years rated their underarm sweating severity and frequency from the time they awoke the previous

day using the 11-item HDSM-Ax adult version instrument. At baseline, the median gravimetric sweat production (GSP) over 5 minutes for sofpiroonium versus vehicle was 214.1 mg versus 228.6 mg in CARDIGAN 1 and 207.7 mg versus 231.1 mg in CARDIGAN 2.^{6,7}

Subjects were randomized and directed to apply either sofpiroonium or placebo to their underarms once daily at bedtime consecutively for 6 weeks, followed by a 2-week post-treatment follow-up. The co-primary endpoints were the percentage of subjects with ≥ 2 -point amelioration in the HDSM-Ax-7 scale score and the change in GSP from baseline to day 43.^{6,7} The results are summarized in Table 1.

Glycopyrronium cloth 2.4% (Qbrexra) was one of the first FDA-approved (in 2018) prescriptions for PAH. When compared to its vehicle, the change in sweat production at week 4 was -81 mg/5 minutes versus -66 mg/5 minutes in Trial 1 (N = 229 for glycopyrronium vs 115 for the vehicle) and -79 mg/5 minutes versus -58 mg/5 minutes in Trial 2 (N = 234 for glycopyrronium vs 119 for the vehicle).⁴

ADVERSE EVENTS

The safety of sofpiroonium was assessed in two randomized, double-blind, multi-center, vehicle-controlled trials, CARDIGAN 1 and CARDIGAN 2. The adverse events in $\geq 2\%$ of subjects with PAH are summarized in Table 2.⁶

In an open-label, long-term safety trial (ARGYLE), 197 subjects were treated with sofpiroonium for 48 weeks. Adverse reactions occurring in $\geq 2\%$ of subjects included dry mouth (17%); blurred vision (19%); the application site: pruritus (15%), dermatitis (11%), erythema (8%), pain (15%), lesions (4%), folliculitis (3%), dryness (2%), exfoliation (3%), and irritation (6%); mydriasis (5%);

Table 1. Primary Efficacy End Points in Subjects (ITT Population) with Primary Axillary Hyperhidrosis on Day 43 in CARDIGAN 1 and CARDIGAN 2 Trials

	CARDIGAN 1		CARDIGAN 2	
	SOFPIRONIUM (N = 172)*	VEHICLE (N = 177)	SOFPIRONIUM (N = 178)	VEHICLE (N = 169)
Proportion of subjects achieving ≥ 2 -point amelioration in the HDSM-Ax-7 score from baseline to day 43	49% (84/172)	29% (51/177)	64% (114/178)	48% (81/169)
Baseline median GSP in subjects ≥ 10 years of age (mg/5 minutes)	N = 173* 214	N = 177 229	N = 180 208	N = 171 231
Change in GSP from baseline to day 43 (mg/5 minutes)	-128**	-100	-143	-134

Abbreviations: HDSM-Ax: Hyperhidrosis Disease Severity Measure Axillary, 7-item scale score; GSP: gravimetric sweat production.

*Number of patients in the intent-to-treat (ITT) population.

**(-) minus sign indicates the magnitude of decrease in GSP levels from baseline to day 43.

Table 2. Adverse Events in $\geq 2\%$ Subjects with Primary Axillary Hyperhidrosis Treated with Sofpironium in CARDIGAN 1 and CARDIGAN 2 Trials

	SOFPIRONIUM (N = 353)	VEHICLE (N = 347)
Adverse events, n (%)		
Dry mouth	51 (14)	2 (0.6)
Vision blurred	30 (9)	1 (0.3)
Mydriasis	23 (7)	0
Urinary retention	8 (2)	0
Local skin adverse reactions, n (%)		
Pain	29 (8)	6 (2)
Erythema	23 (7)	1 (0.3)
Dermatitis	21 (6)	1 (0.3)
Pruritus	16 (5)	2 (0.6)
Irritation	8 (2)	1 (0.3)
Exfoliation	7 (2)	1 (0.3)

upper respiratory tract infection (4%); eye dryness (4%); urinary retention (4%); hypertension (3%); upper respiratory tract viral infection (2%); headache (2%); and influenza (2%).⁶

GERIATRIC USE

The clinical trials did not include ample information to conclude whether subjects aged ≥ 65 years respond differently from younger patients.

DESCRIPTION, DOSAGE FORMS, AND STRENGTHS

Sofpironium gel is a white to off-white powder designed for topical application. The chemical name of sofpiro-
CN1CCCC1C(=O)OC(=O)c2ccccc2C3CCCC3 is 3'(R)-[2(R) cyclopentylphenylhydroxy-acetoxy]-1'-methyl-1'-ethoxycarbonylmethyl-pyrrolidinium bromide, and its molecular weight is 470.4 g/mol. It is soluble in water, chloroform, ethanol, acetonitrile, and methanol.

The gel contains 12.45% (w/w) sofpiro-
CN1CCCC1C(=O)OC(=O)c2ccccc2C3CCCC3 (equivalent to 15% sofpiro-
CN1CCCC1C(=O)OC(=O)c2ccccc2C3CCCC3 bromide), and each pump delivers 72 mg of sofpiro-
CN1CCCC1C(=O)OC(=O)c2ccccc2C3CCCC3 (equivalent to 87 mg of sofpiro-
CN1CCCC1C(=O)OC(=O)c2ccccc2C3CCCC3 bromide) in 0.67

mL of gel. The inactive ingredients in the gel are citric acid, 77.2% dehydrated alcohol, hydroxypropyl cellulose, hexylene glycol, and isopropyl myristate.

CONCLUSIONS

Sofpironium represents a significant advancement in the treatment of PAH, offering a safe, noninvasive, and effective solution. Notable is the lack of palpitations and chest tightening, compared to systemically administered glycopyrrolate. Prospective patients must be informed of the adverse events (AEs) profile, including blurred vision. Its ability to inhibit acetylcholine receptors on sweat glands, coupled with favorable clinical trial outcomes, underscores its role as a promising therapy for enhancing patient comfort and quality of life.

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NEW THERAPY UPDATE

William Abramovits, MD; Aditya K. Gupta, MD, PhD, FRCPC, Section Editors

SIRTURO[®] (Bedaquiline) for Oral Use in Pulmonary Tuberculosis (TB) due to Multi-Drug Resistant (MDR) *Mycobacterium tuberculosis*

Aditya K. Gupta, MD, PhD, FRCPC;^{1,2} Avantika Mann, PhD;² Kimberly Vincent, MD;³ William Abramovits, MD^{4,5,6}, SIRTURO (bedaquiline), SIRTURO is the trademark of Janssen Therapeutics

ABSTRACT

SIRTURO[®] (bedaquiline) is approved as a combination therapy in adult and pediatric patients (aged ≥ 5 years and with a body weight of ≥ 15 kg) with pulmonary tuberculosis (TB) caused by *Mycobacterium tuberculosis* resistant to first-line treatments, rifampicin, and isoniazid. A randomized, open-label study evaluated the efficacy and safety of oral bedaquiline combined with other anti-TB drugs for over 40 weeks. A total of 588 patients were randomized in a 1:2:2:2 ratio to one of the four treatment regimens: Arm A (n = 32), a 20-month regimen recommended by the World Health Organization from 2011 to 2018; Arm B, control regimen (n = 202), 9 months of moxifloxacin, clofazimine, pyrazinamide, and ethambutol given for 40 weeks, and kanamycin, high-dose isoniazid, and prothionamide (given for the first 16 weeks); Arm C (n = 211), 9-month regimen comprising bedaquiline, clofazimine, levofloxacin, ethambutol, and pyrazinamide, supplemented by high-dose isoniazid and prothionamide (given for the first 16 weeks); and Arm D, 6-month regimen (n = 143), comprising bedaquiline, clofazimine, levofloxacin, and pyrazinamide, supplemented by high-dose isoniazid and kanamycin for the first 8 weeks. In Arm C, 82.7% (162/196) of the patients presented with a favorable outcome, compared with 71.1% (133/187) in Arm B, demonstrating that Arm C was non-inferior to Arm B. (SKINmed. 2025;23:399–402)

Multidrug-resistant (MDR) tuberculosis (TB) is an acute form of TB caused by *Mycobacterium tuberculosis* resistant to at least rifampicin and isoniazid, two crucial first-line agents. Because rifampicin and isoniazid are not effective in MDR-TB, patients need to be treated with alternative drugs¹ that include ethionamide, fluoroquinolone, and such first-line oral drugs as ethambutol and pyrazinamide, as well as injectables, such as amikacin, kanamycin, streptomycin, and capreomycin.¹ These agents often have significant adverse effects and are less effective. In addition, *M. tuberculosis* may also develop resistance to these drugs. As a result, it is both time-consuming and expensive to treat MDR-TB; therefore, novel anti-TB agents with distinct modes of action are urgently needed.²

Bedaquiline, a diarylquinoline with a novel mechanism of action, has been approved recently by the US Food and Drug Administration (US FDA) for use in combination therapy to treat MDR-TB in adult and pediatric patients.¹

INDICATIONS, USAGE, AND ADMINISTRATION

Bedaquiline is a diarylquinoline antimycobacterial drug recommended for the treatment of adult and pediatric patients (aged ≥ 5 years with a body weight of ≥ 15 kg) with pulmonary TB caused by *M. tuberculosis* resistant to at least rifampicin and isoniazid.

Bedaquiline must be administered with directly observed therapy (DOT) and prescribed with at least four other drugs to which the isolate from a TB patient is probably susceptible.³

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MECHANISM OF ACTION

Bedaquiline prevents the growth and proliferation of *M. tuberculosis* by inhibiting adenosine triphosphate (ATP) synthase enzyme. It binds to subunit “c” of the enzyme crucial for generating energy in *M. tuberculosis*.³

CLINICAL STUDIES

Accelerated approval was granted to bedaquiline by the US FDA in 2012. The approval was based on three studies for adult patients (Study 1 [NCT00449644, Stage 2]; Study 2 [NCT00449644, Stage 1]; and Study 3 [NCT00910871, Phase 2b]) and one study on pediatric patients (NCT02354014).^{1,4–7}

In 2024, full approval was granted to the drug by the US FDA based on a Phase 3 STREAM Stage 2 study (NCT02409290).^{8,9} It was the first large-scale, randomized, open-label study performed to evaluate the efficacy and safety of all-oral bedaquiline administered with other oral anti-TB drugs for 40 weeks. Patients with sputum smear-positive pulmonary TB caused by *M. tuberculosis* (resistant to rifampicin, regardless of susceptibility to isoniazid)

were included in the study. Patients were excluded if they were infected by a strain of *M. tuberculosis* resistant to fluoroquinolones or a second line of injectables. Detailed inclusion and exclusion criteria have been provided previously.^{8,9}

A total of 588 patients were randomized in 1:2:2:2 ratio to one of the following four treatment regimens: Arm A, the long regimen (n = 32), a 20-month regimen recommended by the World Health Organization (WHO) from 2011 to 2018; Arm B, the control regimen (n = 202), a 9-month regimen comprising moxifloxacin, clofazimine, pyrazinamide, and ethambutol given for the complete 40 weeks, and kanamycin, high-dose isoniazid, and prothionamide given for the first 16 weeks; Arm C, the oral regimen (n = 211), a 9-month regimen comprising bedaquiline, clofazimine, levofloxacin, ethambutol, and pyrazinamide, supplemented by high-dose isoniazid and prothionamide given for the first 16 weeks; Arm D, a 6-month regimen (n = 143), comprising bedaquiline, clofazimine, levofloxacin, and pyrazinamide, supplemented by high-dose isoniazid and kanamycin for the first 8 weeks.^{3,8}

Table 1. Efficacy Outcomes at Week 76 and Week 132 in the mITT^a population in the STREAM Stage 2 Study

	ARM C BEDAQUILINE (N = 196)	ARM B ACTIVE CONTROL (N = 187)
Week 76, n (%)		
Favorable outcome	162 (82.7)	133 (71.1)
Unfavorable outcome	34 (17.3)	54 (28.9)
Reasons for unfavorable outcome through week 76^b		
Treatment modified or extended	16 (8.2)	43 (23.0)
No culture results within week 76 window	12 (6.1)	7 (3.7)
Death through week 76	5 (2.6)	2 (1.1)
At least one of the last two cultures positive at week 76	1 (0.5)	2 (1.1)
Week 132, n (%)^c		
Favorable outcome	154 (78.6)	129 (69)

Notes. ^amITT: modified intent-to-treat was the primary efficacy population and included all randomized patients with a positive sputum culture for *M. tuberculosis* that was resistant to at least rifampicin and not resistant to both fluoroquinolones and second-line injectables. The antifungal susceptibility results were determined prior to randomization. A total of 196 and 187 patients were included in the Arm C and Arm D of mITT population, respectively.

^bAn unfavorable outcome at week 76 was determined by looking at several factors together: changes in the treatment, at least one positive culture result, or no culture results at all, or death because of any cause within the 76-week period.

^cData collection for the study ended when the last enrolled patient was expected to reach week 96. This signifies that all patients had their treatment efficacy data collected for at least 96 weeks. For some patients, the study extended data collection up to week 132. Specifically, 146/196 (74.5%) patients in Arm C and 145/187 (77.5%) patients in Arm B were followed up until week 132; thus, while every patient was tracked up to week 96, some subjects had their data collected for a longer period, i.e., up to week 132.

Bedaquiline was administered as 400 mg once daily for the first 2 weeks and 200 mg thrice a week for the following 38 weeks (in Arm C) or for 26 weeks (in Arm D). All patients were followed up to week 132 (completion of the study). Because of the updated treatment guidelines, no new patients were added to Arms A and D; however, patients who were part of these groups continued their treatment and followed up as planned originally.^{3,8}

The study's primary objective was to determine whether the number of patients with a favorable outcome in Arm C was non-inferior to Arm B at week 76. The primary efficacy endpoint was a favorable status at week 76. Favorable status was defined as a negative culture for *M. tuberculosis* at week 76 and on the preceding visit, with no intervening positive culture or any preceding unfavorable outcome. The definition of unfavorable outcomes and the primary efficacy results are summarized in Table 1.^{3,8}

ADVERSE EVENTS

Table 2 presents the adverse events occurring in ≥5% of the patients receiving a 40-week bedaquiline regimen in the STREAM Stage 2 study.

GERIATRIC USE

A sufficient number of patients aged ≥65 years were not included in the studies to determine any difference, compared to younger adult patients.

DESCRIPTION, DOSAGE FORMS, AND STRENGTHS

Bedaquiline contains bedaquiline fumarate, an antimycobacterial drug belonging to diarylquinoline class, meant for oral use. A single 20-mg bedaquiline tablet provides 20 mg of bedaquiline equivalent to 24.18 mg of bedaquiline fumarate.

The recommended doses for adults and pediatrics are summarised in Tables 3 and 4.

CONCLUSIONS

The STREAM Stage 2 demonstrated that the bedaquiline regimen was non-inferior to the control regimen. Bedaquiline offers a promising treatment option for patients with MDR-TB; however, safer and simpler alternatives are still needed.

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Table 2. Adverse Events Occurring in ≥5% of the Patients in STREAM Stage 2 Study

ADVERSE EVENTS	ARM C BEDAQUILINE N = 211 N (%)	ARM B ^a ACTIVE CONTROL N = 202 N (%)
QTc prolongation	128 (61)	113 (56)
Nausea	114 (54)	126 (62)
Vomiting	112 (53)	125 (62)
Arthralgia	93 (44)	67 (33)
Transaminases increased ^b	63 (30)	59 (29)
Abdominal pain ^c	60 (28)	48 (24)
Pruritus ^d	58 (27)	44 (22)
Dizziness	37 (18)	42 (21)
Headache	36 (17)	36 (18)
Chest pain	33 (16)	24 (12)
Eruptions ^e	30 (14)	17 (8)
Insomnia	30 (14)	19 (9)
Dry skin	25 (12)	16 (8)
Palpitations	21 (10)	13 (6)
Myalgia	19 (9)	6 (3)
Paresthesia	16 (8)	8 (4)
Diarrhea	12 (6)	17 (8)

Notes. QTc: corrected QT interval.

^aThis study was not designed to draw meaningful comparisons of the incidences of adverse events in Arms C and B.

^bTransaminases increase includes increased aspartate aminotransferase (AST), alanine aminotransferase (ALT), hepatic enzyme, abnormal hepatic function, hypertransaminasemia, and increased transaminases.

^cAbdominal pain includes abdominal pain, upper and lower abdominal pain, and abdominal tenderness.

^dPruritus includes pruritic eruptions and generalized pruritus.

^eEruptions include popular and maculopapular eruptions.

Table 3. Recommended Dose of Bedaquiline in Adult Patients

WEEKS 1 AND 2	WEEKS 3–24 [*]
400 mg (4 × 100-mg tablets or 20 × 20-mg tablets) once daily	100 mg (2 × 100-mg tablets or 10 × 20-mg tablets) three times per week

Note. ^{*}There must be a gap of at least 48 hours between doses.

Table 4. Recommended Dose of Bedaquiline in Pediatric Patients (Aged ≥5 Years and Weighing ≥15 Kg)

BODY WEIGHT	DOSAGE*	
	WEEKS 1 AND 2	WEEKS 3–24
15 kg–<30 kg	200 mg (2 × 100-mg tablets or 10 × 20-mg tablets) once daily	100 mg (1 × 100-mg tablets or 5 × 20-mg tablets) three times per week
≥30 kg	400 mg (4 × 100-mg tablets or 20 × 20-mg tablets) once daily	200 mg (2 × 100-mg tablets or 10 × 20-mg tablets) three times per week

Note. *There must be a gap of at least 48 hours between doses.

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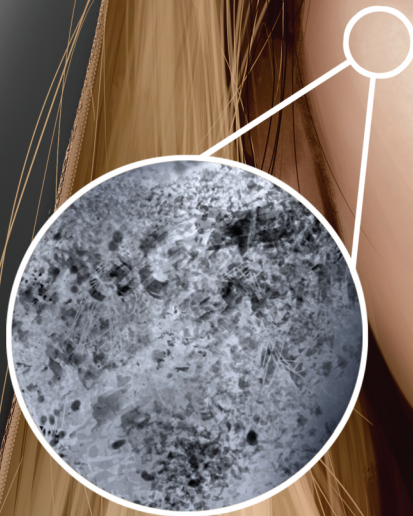


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CASE STUDY

Vesna Petronic-Rosic, MD, MSc, MBA, Section Editor

Effective Management of Refractory Brunsting–Perry Cicatricial Pemphigoid with Dupilumab

Zaryab Alam, BS¹, Rashwan Alameddine, BS¹, Mojahed Shalabi, MD², Christopher T. Haley, MD²

A 37-year-old woman presented with tender vesicular eruptions localized to the face, scalp, and neck, associated with pruritus and progressive scarring but without oral mucosal involvement or photosensitivity. Clinical examination revealed multiple lesions, some with manifestations of post-inflammatory hyperpigmentation (Figures 1A–1C). Her medical history included a complete hysterectomy and recent initiation of estrogen supplementation. She had no history of autoimmune diseases, malignancy, or new medications aside from antibiotics and corticosteroids prescribed for the eruptions that were ineffective. A biopsy of an active lesion revealed subepidermal vesicular dermatitis, and direct immunofluorescence (DIF) demonstrated linear immunoglobulin G (IgG) deposition and the dominant accumulation of the third component of complement (C3) along the basement membrane zone, while indirect

immunofluorescence (IIF) was negative for laminin 332 auto-antibodies, ruling out mucous membrane pemphigoid (MMP). Enzyme-linked immunosorbent serologic assay (ELISA) detected elevated type VII collagen antibodies (20 U/mL; reference: <7 U/mL normal, >9 U/mL positive), confirming the diagnosis of Brunsting–Perry pemphigoid (BPP). Oral prednisone (60 mg daily, approximately 0.8 mg/kg/day) led to partial improvement but caused debilitating headaches. Trials of dapsone and doxycycline were unsuccessful, prompting a switch to dupilumab (300 mg subcutaneous injections every 2 weeks). Within weeks, her clinical findings diminished, and after several months, there was sustained remission without topical steroids. At follow-up, no new lesions or significant adverse effects were reported, as Figures 2A–2C illustrate no signs of active lesions, and only residual post-inflammatory hyperpigmentation is evident.



Figure 1. (A) Erythematous plaque with secondary scaling, open lesions and scarring on the left preauricular area. (B) Erythematous patch on the right cheek with excoriated papules. (C) Multiple erythematous plaques on the right cheek, jawline, and lateral side of the neck, some with manifestations of post-inflammatory hyperpigmentation.

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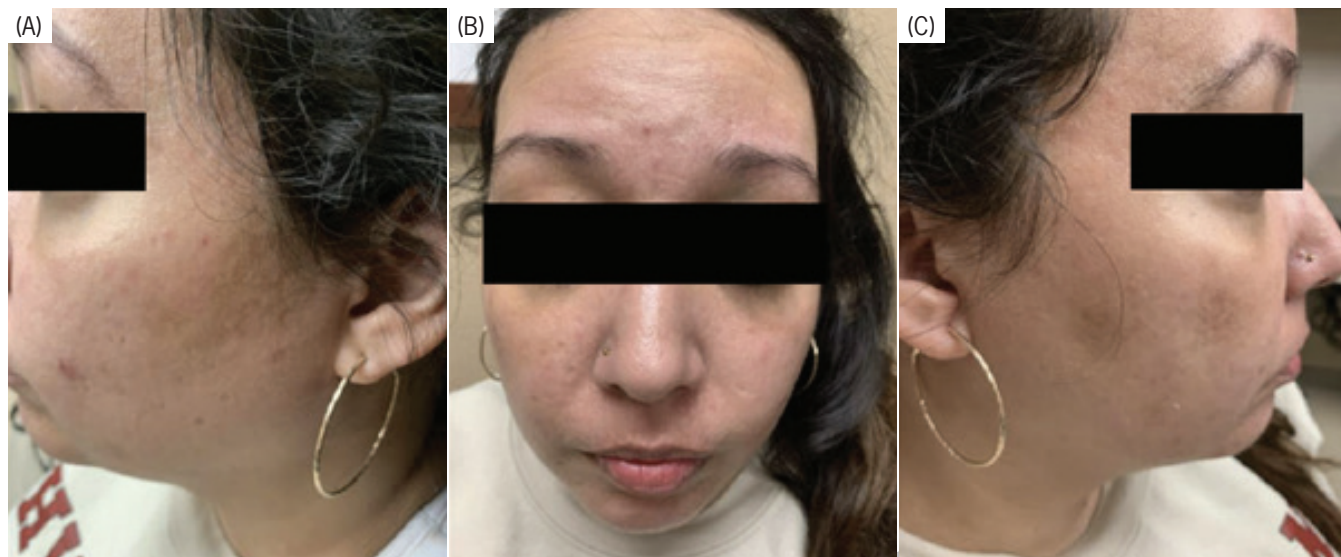


Figure 2. (A)–(C) No signs of active lesions. Residual post-inflammatory hyperpigmentation on the areas involved in the past is visible.

DISCUSSION

Brunsting–Perry cicatricial pemphigoid is a rare autoimmune blistering disorder characterized by vesicular eruptions that primarily affect the head and neck region, often leading to scarring.¹ The condition is commonly reported in older adults, with predominance in men; its appearance in younger patients particularly unusual.² Diagnosis and management of BPP remain challenging on account of clinical overlap with other autoimmune blistering disorders, such as bullous pemphigoid (BP), cicatricial pemphigoid (CP), and epidermolysis bullosa acquisita (EBA).^{1,3}

BPP is a rare variant of CP, distinguished by its predilection for the head and neck, with scarring and occasional milia formation.¹ A review of 63 patients noted that 78% presented with scarring and 6% with milia, consistent with the findings of the present study.¹ Alopecia was not observed. Our patient highlights the importance of considering BPP in younger patients presenting with vesicular eruptions in the head and neck region in spite of its typical onset in patients aged 60–70 years.^{1,3}

Diagnostic challenges are because of histologic and immunopathologic overlaps with BP, CP, and EBA.³ DIF findings of linear IgG and C3 deposition along the basement membrane zone are consistent in BPP but not definitive. In the present patient, the elevated type VII collagen antibodies further supported the diagnosis, although EBA was ruled out based on clinical correlation and disease distribution.³ A salt-split skin study, which was not performed in this patient, could further delineate these conditions by demonstrating autoantibody localization.³

Treatment traditionally relies on systemic corticosteroids, often combined with dapsone or cyclophosphamide.² Adverse effects and refractory diseases frequently necessitate alternative therapies. Dupilumab, an interleukin-4 (IL-4) and interleukin-13 (IL-13) receptor antagonist, has established promise in treating BPP.⁴ A 2021 case report demonstrated its efficacy in managing BPP, highlighting its role as a steroid-sparing agent.^[5] Dupilumab's ability to reduce type 2 inflammation may explain its success in controlling this patient's disease, with remission achieved within weeks of initiation.⁴

CONCLUSIONS

Our case report emphasizes dupilumab as a safe and effective treatment for refractory BPP, providing an alternative to traditional immunosuppressive therapies.

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CASE STUDY

Vesna Petronic-Rosic, MD, MSc, MBA, Section Editor

Successful Treatment of Recalcitrant 5-Fluorouracil-Induced Irritant Dermatitis with Roflumilast 0.3% Cream

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ABSTRACT

5-fluorouracil (5-FU) is an antimetabolite chemotherapeutic drug used topically for treating cutaneous squamous cell carcinoma (SCC) and actinic keratosis (AK).¹ Treatment with 5-FU lasts for 2–4 weeks with the aim to achieve complete clearance of lesions.^{1,2} Although highly effective, common adverse effects of 5-FU include local skin reactions, erythema, dryness, and burning.³ 5-FU-induced adverse effects are treated with topical corticosteroids and moisturizers. Alternate therapy is recommended if local adverse events persist. Roflumilast cream 0.3% is a highly selective, potent, nonsteroidal, topical phosphodiesterase 4 (PDE4) inhibitor approved by the US Food and Drug Administration (FDA) for treating psoriasis. In this case study, we described two patients with 5-FU-induced local skin reactions recalcitrant to topical corticosteroids and ruxolitinib 1.5% cream but successfully treated with topical roflumilast 0.3% cream. (*SKINmed*. 2025;23:407–409)

PATIENT 1

An 85-year-old woman with a past medical history of cutaneous squamous cell carcinoma (SCC) and severe actinic damage was prescribed 5-FU twice daily for her facial AKs. After 2 weeks of 5-FU treatment, the patient presented with well-demarcated, brightly erythematous facial patches with associated burning and stinging at the site of 5-FU application. She was initially prescribed hydrocortisone 2.5% ointment, triamcinolone 0.025% ointment, and ruxolitinib 1.5% cream to relieve her clinical manifestations; however, after 5 days, the patient reported persistent and worsened clinical manifestations. Then she was prescribed roflumilast 0.3% cream once daily. After 5 days, the 5-FU-induced severe local skin reaction was resolved with complete remission (Figure 1).

PATIENT 2

A 75-year-old man with a past history of nonmelanoma skin cancer (NMSC) and AKs presented to the clinic with severe local skin reaction and burning after being treated with 5-FU. Examination revealed erythematous patches on the face at the site of 5-FU application. The patient was prescribed ruxolitinib 1.5%

cream along with triamcinolone 0.1% ointment. After a few days, however, the manifestations worsened; then the patient was prescribed topical roflumilast 0.3% cream for use once daily. After 6 days, the erythema and burning resolved with complete recovery (Figure 2).

DISCUSSION

We reported two patients suffering from severe local skin reactions to 5-FU refractory to topical corticosteroids and ruxolitinib 1.5 % cream. After starting topical roflumilast 0.3% once daily, both patients reported resolution of symptoms within 1 week of initiating treatment.

Roflumilast's mechanism of action involves the inhibition of PDE4, resulting in an increase in cyclic adenosine monophosphate (cAMP), which ultimately reduces the release of pro-inflammatory cytokines, such as interleukin-17 (IL-17), IL-23 and tumor necrosis factor- α (TNF- α).⁴ These cytokines are implicated in the pathogenesis and exacerbation of various skin reactions, which explain the effectiveness of roflumilast. The current research supports the use of roflumilast cream for treating atopic

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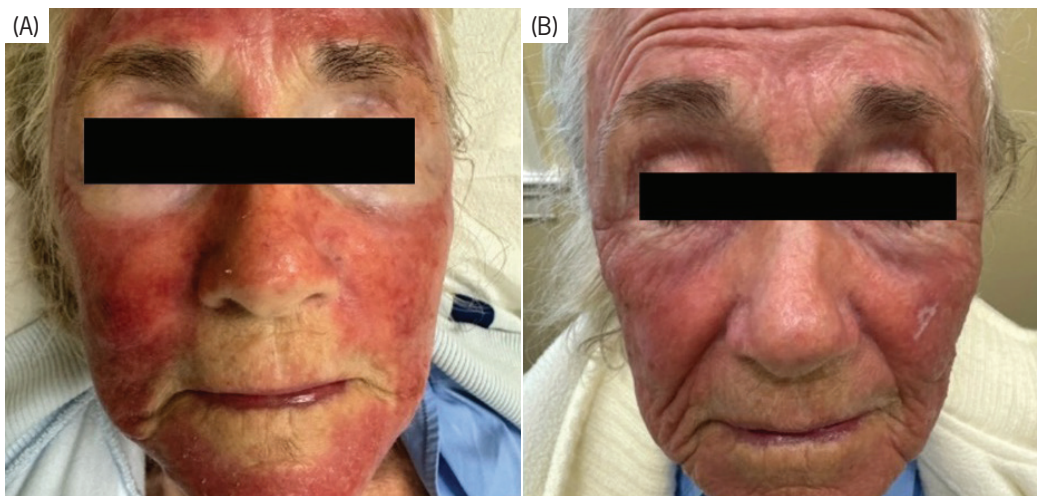


Figure 1. (A) Prior to, and (B) after treatment with topical roflumilast 0.3% once daily for 5 days.



Figure 2. (A) Prior to, and (B) after treatment with topical roflumilast 0.3% once daily for 6 days.

dermatitis and psoriasis, but to our knowledge, this is the first instance demonstrating its use in the treatment of 5-Fu-induced irritant dermatitis. The current treatment guidelines recommend the use of topical corticosteroids to treat 5-Fu-induced irritant dermatitis, with one study reporting successful treatment with clobetasone butyrate ointment.⁵ The patients described in our report, however, failed the initial treatment with topical corticosteroids, emphasizing the importance of identifying alternative treatments, such as roflumilast. These case reports highlighted the soothing vehicle of the cream, as most other topicals caused worsening of burning sensation when applied on highly inflamed skin, thus causing intolerance.⁶ These results suggest that topical roflumilast could be a rapid treatment option for the common local skin reaction associated with 5-FU treatment; however further studies are required to explore this treatment's true efficacy and safety profile.

CONCLUSIONS

To our knowledge, this is the first case report demonstrating the successful use of topical roflumilast 0.3% once daily in the rapid treatment of 5-Fu-induced irritant dermatitis. 5-Fu is a commonly prescribed medication for patients with AK; therefore, it is important to be aware of the potential irritating dermatitis as its adverse effect. Additional studies are needed to evaluate the long-term efficacy of roflumilast to treat 5-Fu-induced irritant dermatitis.

DECLARATION

The authors obtained written consent from patients for publishing their photographs and medical information in print and online with the understanding that this would be available publicly.

CONFLICT OF INTEREST

The authors had no financial disclosures. Dr. Leonardo Tjahjono has served as a consultant for BristolMyers Squibb.

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CORRESPONDENCE

Snejina Vassileva, MD, PhD, Section Editor

Isolated Involvement of Umbilicus: A Rarity of Inverse Psoriasis

Shivani Bansal, MBBS, MD, MNAMS; Sushama Sushama, MBBS, MD

TO THE EDITOR:

Although a number of skin conditions affect the umbilicus, its sole involvement may present a diagnostic dilemma. Flexural or intertriginous psoriasis is a relatively uncommon form of plaque psoriasis that involves body folds. The most commonly affected areas are inguinal folds, followed by the axillae, inframammary folds, perianal area, external genitalia, umbilicus, retroauricular area, antecubital, and popliteal fossae.¹ Lesions in the umbilicus have been always reported with lesions in flexural areas. We present a patient of umbilical lesion, which on histopathology turned out to be psoriasis.

OUR PATIENT

A 20-year-old man presented with a recurrent skin lesion in the umbilicus with itching and a discharge for the past 4 years. On examination of the umbilicus, an erythematous plaque, 2 cm × 2 cm in size, with the central area being macerated with pustular discharge was discovered; the peripheral area was dry with fine whitish scales (Figure 1). We found no involvement of other intertriginous sites was discovered. A differential diagnosis of candidal intertrigo (superficial skin-fold infection caused by the yeast/candida), seborrheic dermatitis, inverse psoriasis, Darier disease, Hailey–Hailey disease, or allergic contact dermatitis because of the fibers of synthetic clothes was established. Potassium hydroxide (KOH) examination of scrapings from the scales revealed the presence of yeast cells.

We prescribed luliconazole cream 1% for local application twice daily for 1 week; however, he reported only a partial response to the treatment. A pus sample taken for culture and sensitivity demonstrated no growth of aerobic organisms after 48 hours of incubation. Ultrasonography of the abdomen and pelvis also did not reveal any patent urachus.



Figure 1. Erythematous plaque in the umbilicus with maceration, pustular discharge in the centre and fine whitish scales in the periphery.

A 3.0-mm punch biopsy with hematoxylin and eosin (H&E) staining was performed and submitted for histopathologic examination. The biopsy depicted a moderately dense superficial perivascular mixed infiltrate of lymphocytes and several neutrophils with regular psoriasiform hyperplasia of the epidermis and corresponding hyperplasia of dermal papillae. Several dermal papillae presented dilated and tortuous capillaries and edema. A suprapapillary thinning of the epidermis was observed, and the granular layer was either thinned or absent. The stratum corneum was thickened and showed broad zones of parakeratosis that harbored numerous pyknotic neutrophils (Munro's microabscesses; Figure 2).

The final diagnosis of inverse psoriasis was made. The patient was prescribed ointment calcitriol 0.0003% and advised to maintain

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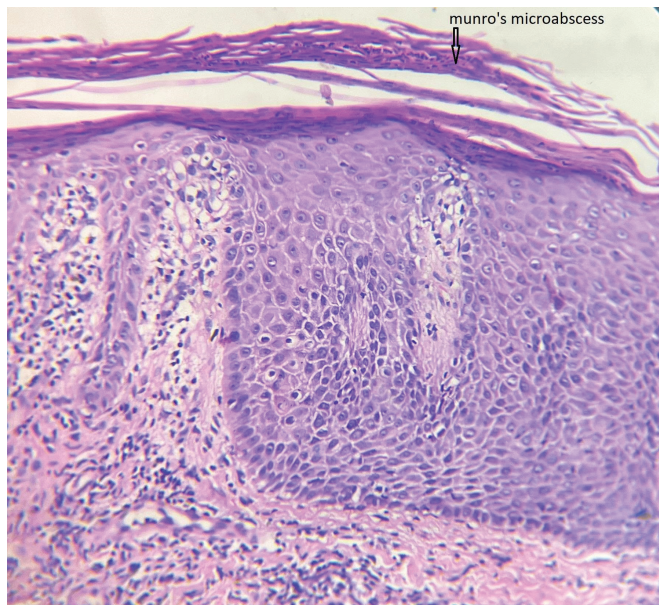


Figure 2. Histopathologic findings of the section of biopsy specimen (Hematoxylin and eosin stain; 10X).



Figure 3. Improvement in lesion after 3 weeks of calcitriol ointment (0.0003%) application.

proper hygiene. A follow-up was performed at 3 weeks, which depicted a marked lessening of the lesion (Figure 3).

DISCUSSION

Inverse psoriasis, also called flexural or intertriginous psoriasis, is an uncommon form of plaque psoriasis that involves skin folds. The most frequently affected areas are the inguinal folds, followed by the axillae, inframammary folds, perianal area, external genitalia, umbilicus, retroauricular area, and antecubital and popliteal fossae.¹ Clinically, lesions appear as well-defined, erythematous plaques having minimal or no scales; plaques can be shiny and moist.² Treatment options include topical calcineurin inhibitors, low- to mid-potency topical corticosteroids, topical vitamin D analogs, narrowband ultraviolet B (NB-UVB) phototherapy, or 308-nm excimer laser.³

Umbilicus lesions are present in congenital malformations, acquired abnormalities, infections, benign or malignant tumors, or manifestation of an internal disease, or are involved in various cutaneous conditions. Longstanding isolated involvement

of the umbilicus, with recurrences after several courses of topical steroids and antibacterial and antifungal agents, created a diagnostic dilemma, which was resolved by skin biopsy, aided by clinical cutaneous findings. Such patients require an attentive approach when presenting with lesions only on the umbilicus. Psoriasis of the umbilicus has always been reported with lesions in flexural areas, although clinical presentation of inverse psoriasis with isolated involvement of the umbilicus was not reported.

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Real-Life Experience with Dupilumab in Moderate-to-Severe Atopic Dermatitis in Children Aged Less than 6 years: A Case Series

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TO THE EDITOR:

Atopic Dermatitis (AD), with a prevalence of up to 22.6%, is a common chronic inflammatory skin disease in the pediatric population. In 85% of patients, it starts prior to 5 years of age, and in half of patients, it persists into adulthood.¹ About one-third of patients develop moderate to severe disease,² with a profound impact on quality of life (QoL), mainly because of pruritus and sleep deprivation, leading to poor school performance, depression, and anxiety.^{1,3}

Until recently, no approved treatment options were accessible; therefore, severe AD patients were classically treated with off-label systemic immunosuppressants. In addition to the lack of high-quality evidence of efficacy, significantly potential adverse events associated with long-term use were observed.^{1,2,4,5}

Dupilumab is a fully human monoclonal antibody that treats type 2 inflammation by blocking the shared receptor component for interleukin-4 and interleukin-13, and it is the first biologic agent approved to treat AD in children. In clinical trials conducted in adolescents and children aged 6–11 years, it was demonstrated to be highly effective and safe in the treatment of moderate to severe AD.^{1,2,6} A phase 3 randomized controlled trial, demonstrating efficacy and safety in children aged 6 months to 6 years with severe AD (Liberty AD PRESCHOOL study; NCT03346434),⁷ obtained FDA approval in June 2022 and was approved in Europe in March 2023; however, real-life safety and efficacy data are still scarce.

PATIENTS

We present six patients aged less than 6 years with severe AD. The patients were treated with topical corticosteroids (TCS), topical calcineurin inhibitors (TCI), oral prednisolone, and cyclosporine, with unsatisfactory response. Because of the severity of



Figure 1. Two illustrative patients of clinical response after 16 weeks of dupilumab treatment. Patient 1: (A) pretreatment response and (B) post-treatment response. Patient 2: (C) pretreatment response and (D) post-treatment response.

the disease and lack of response to conventional treatment, dupilumab was started with an initial dose of 600 mg, followed by 300 mg every 4 weeks. TCS and TCI were prescribed whenever necessary. Evaluations were performed at week 4, 8, and 16, and then after every 12 weeks.

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Table 1. Demographics, baseline disease characteristics, and dupilumab treatment follow-up

	PATIENT 1	PATIENT 2	PATIENT 3	PATIENT 4	PATIENT 5	PATIENT 6
Gender/age (years)	M/2	M/4	M/4	F/4	M/5	F/4
Family history of atopy	Yes	Yes	Yes	Yes	No	Yes
Atopic comorbidities	No	Rhinitis	Rhinitis and food allergies [†]	No	No	No
Concomitant treatments [‡]	No	No	No	No	No	TCS and TCI
Basal state						
EASI	25	32.4	32.7	44.5	32.1	37.5
DLQI	16	22	18	22	18	20
NRS	NA	9	10	10	9	8
Follow-up period (weeks)	16	16	40	28	16	40
Last assessment						
EASI	2	2.10	1.90	1	8.10	7
DLQI		2	3	0	1	9
NRS		2	1	0	3	3
EASI90	16 weeks	16 weeks	16 weeks	16 weeks	--	16 weeks
Maximum EASI variation	92	94	97	98	75	91
Adverse effects	None	None	None	Facial erythema [§]	None	None

TCS: topical corticosteroids; TCI: topical calcineurin inhibitors; EASI: Eczema Area and Severity Index; DLQI: Dermatology Life Quality Index; NRS: Numeric Rating Scale; NA: not applicable.
[†]Fish, milk, egg, and seafood.
[‡]We considered only those patients who still required concomitant treatment after 16 weeks of dupilumab treatment.
[§]Mild and resolved spontaneously.

All patients presented extensive, exudative, and highly pruritic lesions, involving the face, trunk, and extremities, with significant impact on QoL. The median baseline absolute Eczema Area and Severity Index (EASI) was 34.0 (25–44.5), and minimal Dermatology Life Quality Index (DLQI) and numeric rating scale (NRS) were 18 and 9, respectively. At week 16, all patients revealed significant improvement, with a mean absolute EASI of 3.3 (1–8.1), with five patients attaining eczema area and severity index-90 (EASI90). In addition, the DLQI and NRS scores had an average drop of 12 and 6 points, respectively. Patient 1 had a particularly rapid response, reaching EASI90 at week 8. Patients continued treatment, with a maximum follow-up time of 40 weeks. Clinical response was maintained or improved slightly, except for patient 6, which experienced a transitory loss of response at 28 weeks, possibly associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. After that, patient 6 recovered gradually, reaching eczema area and severity index-80

(EASI80) at week 40. Regarding safety, only one patient with mild and transient facial erythema was recorded. Other adverse effects, such as conjunctivitis or reaction at the injection site, were not observed (Table 1).

DISCUSSION

Our experience preserved conclusions of the Liberty AD PRESCHOOL trial, with dupilumab proving effective and safe in real-life context. Nonetheless, for the first time it was possible to effectively treat AD in children aged <6 years; hence, we wondered whether a prior immunomodulatory action could have a long-term impact on the course of the disease.⁵ The low relapse rate observed in adolescents after 1 year of treatment discontinuation suggested this, although flares could occur after long-lasting remissions.⁵ In addition, it is recognized that pediatric AD has a different phenotypic and immunologic profile from that of

adults; hence, results from adult clinical trials may not be parallel to those of children; thus, extended clinical trials are required to clarify long-term effects in this age group.

CONCLUSIONS

Our case series adds to the scarce real-life experiences, pointing out the efficacy and safety of dupilumab treatment in young children.

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Striae, an Immunocompromised Region, Resulting in Koebnerization of Lichen Planus

Prabin P. Dev, MD; Shikha Bansal, MD

TO THE EDITOR:

We describe a rare presentation of Koebnerization of lichen planus lesions on the striae distensae in an adolescent. Two patients with lichen planus presented on the striae gravidarum are reported in the literature;^{1,2} however, similar to our patient, no occurrence of lichen planus appearing on adolescent striae distensae has been reported.

CASE REPORT

A 16-year-old boy presented with superimposed violaceous to brown confluent to discrete papules on pinkish-white depressed plaques on the lower back (Figure 1). He had these asymptomatic depressed plaques, which were progressing slowly, for the past 2 years. The patient was having itchy purple papules on these lesions and bilaterally on the wrists and ankles since past 2 months. Dermatoscopic examination of violaceous lesion on the lower back showed purplish-white crossing streaks

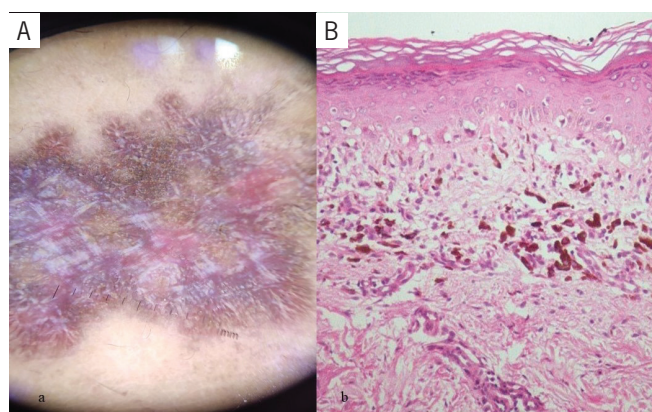


Figure 2. (A) Dermatoscopic examination showing purplish-white crossing streaks (Wickham striae) and peripheral pigmented dots and scaling (DermLite DL3N, dry, contact, polarized, ×10). (B) Histopathologic examination showing hypergranulosis, basal cell vacuolar change, and lymphocytic infiltrate with melanophages (hematoxylin and eosin [H&E], ×20).

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Figure 1. Lichen planus superimposed on lesions on adolescent striae distensae.

suggestive of Wickham striae and peripheral pigmented dots and scaling (Figure 2A). The oral cavities and nails were normal. Histopathologic examination of one of these papules showed hypergranulosis, basal cell vacuolar changes, lymphocytic infiltrate, and melanophages (Figure 2B). The diagnosis of lichen planus superimposed on lesions on adolescent striae distensae was made. The patient was experiencing striae for the past 2 years and had developed lichen planus in the past 2 months. It is important to note that no treatment was initiated with topical corticosteroids contributing to the development of striae. These lesions were exclusively observed on the striae, sparing the in-between areas.

DISCUSSION

Lichen planus is a T-cell-mediated autoimmune consideration that affects basal keratinocytes and is triggered by various stimuli. These appear on the wrists, lower back, and ankles as shiny, flat-topped, polygonal papules and plaques. Koebner's phenomenon is described in lichen planus, in which new skin lesions appear in the areas of cutaneous injury. Koebner's phenomenon is generally classified as true, pseudo, occasional, poor, or questionable Koebnerization. Only vitiligo, psoriasis, and lichen planus (LP) have true Koebnerization.³ Recently, Koebner's phenomenon has been further subdivided as determined from history and induced

experimentally by external trauma.⁴ Striae appear on the skin as a result of damage to the dermis and epidermis by rapid growth or overstretching. Disturbances to the connective tissue and an increase in transepidermal water loss (TEWL) are their defining features. External mechanical stimuli to the skin include not only penetrating trauma but also trauma to the epidermis by stretching during the formation of striae. Skin stretching is regarded as a type of physical injury.

Also, striae are considered a type of immunocompromised district, forming the basis of Koebnerization. Reports of lichenoid graft versus host disease (GVHD) and vitiligo localized predominantly to the striae have appeared.^{5,6} A group of authors developed the concept of immunocompromised regions of the skin, which explained some elements of the Koebner's phenomenon.⁷ The immunocompromised regions are described as a localized impairment of the immune system and other skin functions. Koebnerization could be the result of this localized immunologic dysfunction.

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Sentiment Analysis of Hirsutism Treatments on Twitter

Jonathan Xu, MS; Nicholas A. Ross, MD

TO THE EDITOR:

The hair removal industry is valued at billions of dollars.¹ One of the most common reasons for dermatologic consultations is unwanted facial hair which accompany hormonal changes with pregnancy, menopause, and endocrinopathies.² Medications such as glucocorticosteroids, cyclosporine, and tacrolimus, could increase facial hair as well. While facial hair is distinct from true hirsutism, which is characterized by terminal hair in androgen-dependent areas of the body, the term is frequently used interchangeably; in addition, hypertrichosis refers to hair growth not limited to these areas.³ With sentiment lexicons in natural language understanding, the authors conduct a sentiment analysis of hirsutism treatments on Twitter to uncover themes in the public conversation—as patients increasingly utilize social media in seeking information on available treatments.

METHODS

The authors analyzed 280-character “tweets” on Twitter in the R language and the Twitter Application Programming Interface (API) v2. Exempted by institutional review board (IRB) for publicly available data sources, this study utilized Twitter API v2 endpoints to retrieve content of all tweets between 12 AM coordinated universal time (UTC) on September 1, 2021 and 12 AM UTC on September 1, 2022 containing “hirsutism” and lexemes of treat(ment) or removal. “Hirsutism” was selected over variations of “facial hair,” which was not used because “facial hair” included tweets involving facial hair in men. The query filtered non-English tweets and included retweets to weigh the frequency of term usage. Following the filtration of stop words in natural language processing, the authors performed sentiment analysis with Bing lexicon. The authors created word frequency and word cloud visualizations for insight into patient discussion around treatment modalities.

RESULTS

The frequency of the 22 most common words related to “hirsutism” and lexemes of treat(ment) or removal, found in 589 tweets

between 12 AM UTC on September 1, 2021 and 12 AM UTC on September 1, 2022 is presented in Figure 1. “Women” was the most common word in the dataset. Hashtags #acne, #severe acne, #alopecia were also co-tweeted frequently. The fourth most common word in the dataset was “#OralContraceptive,” while the eighth most common word was “#CyproteroneAcetate.” This emphasizes the popularity of cyproterone-containing formulations, such as “Ginette-35” and “Diane-35,” which were, respectively, the tenth and nineteenth most frequently co-tweeted terms.

The sentiment analysis word cloud (Figure 2) centered “effective,” which was the largest term in the graphic. “Effective” (treatment) was flanked at the negative pole by “risks,” “resistance,” and “expensive,” and at the positive pole by “safe,” “reliable,” and “advanced.” Terminology regarding emotions and feelings included “concerns,” “critical,” “suffer,” and “mocked” at the negative pole, and “love,” “beauty,” and “comfort” at the positive pole.

DISCUSSION

Although polycystic ovarian syndrome (PCOS) was the eleventh most mentioned term ($n \sim 100$), PCOS accounted for more than 75% of hirsutism.⁴ Variations of hyperandrogenism, such as “Androgen Dependent” ($n \sim 125$), “alopecia” ($n \sim 100$), and “androgenization” ($n \sim 60$), exceeded “women” ($n \sim 260$) by aggregate term count. There was no mention of menopause, despite the association between menopause and facial hair. This observation could reflect the demographics of the Twitter users who posted the tweets; however, specific demographic data are not available through the API, in accordance with user confidentiality policy of Twitter. In addition, it would represent the distinction between increased facial hair and true hirsutism (which is not limited to the face).⁵

The sentiment analysis word cloud (Figure 2) highlights the centrality of “effective” treatment in the Twittersphere; it is an indication of the aims and intentions driving discussion: users are

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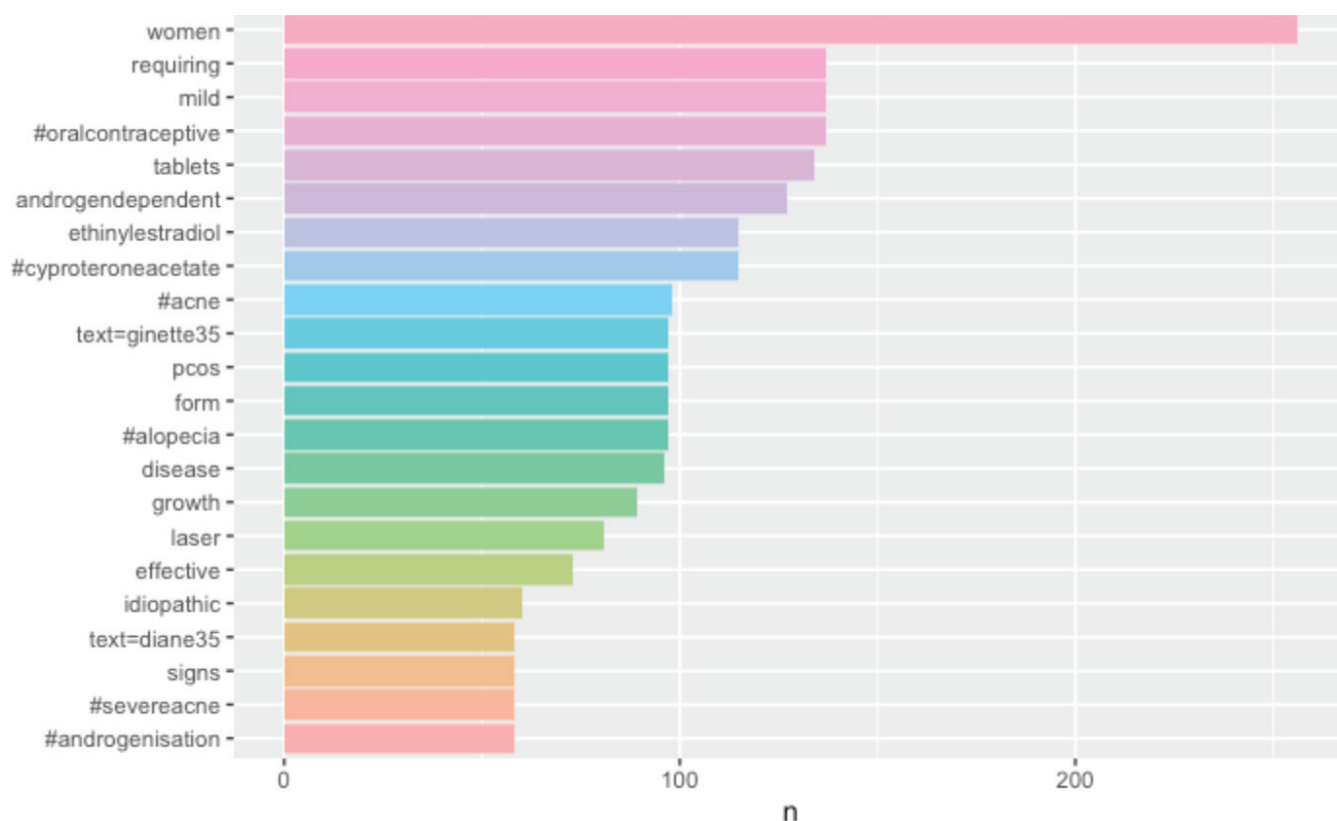


Figure 1. The 22 most common words related to “hirsutism” in 589 tweets fulfilling criteria, by frequency.



Figure 2. Sentiment analysis word cloud (Bing lexicon).

utilizing social media to identify longstanding treatments for this chronic condition. Treatment of utilizing oral contraceptive pills (OCP) was by far the most frequent treatment mentioned.

“Laser,” or photoepilation (intense pulsed light), was the only procedural treatment represented in the top 22 list, even upon expanding word frequency scores to the top 100 terms. Other hair removal techniques, such as plucking, waxing, chemical depilatory agents, and electrolysis, were not present in the top 22 terms. Discussion of adverse reactions and limitations of these treatments did not have a strong profile either (apart from the entity “risks” in the word cloud), indicative of the role that dermatologists need to play in guiding patients through treatment options. Particularly with “expensive” as a consideration represented in the word cloud, topical eflornithine is an expensive treatment with safety risks still unknown for pregnant women. Finally, anti-androgens, such as oral spironolactone and finasteride, used to treat hirsutism were not as commonly used terms as the variations of OCPs represented in the analysis.^{4,5} Spironolactone was the 92nd most used term. The remaining words in the word cloud depicted the psychologic stress experienced by individuals with hirsutism: they “suffer,” carry “concerns,” and feel “abnormal” in their womanhood.

This was consistent with higher depression scores and decreased social functioning in women with hirsutism, for whom framing the chronic condition as a medical disease helped in alleviating self-accusation and blame.⁶

CONCLUSIONS

In this study, the authors conducted a sentiment analysis of hirsutism treatments on Twitter to understand public discussions around this topic. They analyzed tweets containing the terms “hirsutism” and lexemes of “treatment” or “removal” from September 1, 2021 to September 1, 2022. The most common co-tweeted treatments are OCPs and, specifically, treatments containing cyproterone acetate, emphasizing the prevalence of cyproterone-containing formulations in public dialogue. This suggests a high level of awareness and acceptance of these types of treatments by social media users.

The sentiment analysis also sheds light on the emotional aspects of hirsutism. Words, such as “effective,” surrounded by both positive and negative descriptors, dominate the conversation. This underscores the complexity of patient priorities and concerns, pointing to the importance of treatments that not only address the physical clinical manifestations but also consider the psychological impact of the condition.

Interestingly, “laser” is the only physical hair removal technique mentioned among the most common terms. This indicates a preference for or greater awareness of this specific method over

other procedural treatments. Notably, anti-androgen hirsutism treatments are mentioned relatively less frequently, possibly hinting at a lack of public knowledge or enthusiasm for these options.

These findings underscore the critical role of dermatologists in not only providing medical treatment but also guiding patients through the array of available options. The findings further highlight the need for practitioners to address the psychological stress associated with hirsutism, a crucial factor that shapes patient perception and decision-making concerning the treatment.

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Housewife’s Hand Dermatitis and Pregnancy: Incidence of Atopic Diathesis

Yasuhiro Horiuchi, MD

TO THE EDITOR:

Housewife’s hand dermatitis is not always considered a routine immunologic skin disease.¹ Homemakers use their hands for domestic chores, such as cooking, which exposes them to many contact antigens drawn from vegetables and fruits, wheat, meat, and fish;² however, the hands are given little attention even if they appear rough or have dermatitis. The use of detergents leads to the

removal of sebum, and the resulting dry and rough skin becomes more susceptible to dermatitis. It is, therefore, customary for homemakers to use steroid ointments, such as hand creams. The author has long observed that patients with housewife’s hand dermatitis often have an atopic predisposition. In addition, although this condition is related to touch, it appears to worsen with an increase in the number of children in the household.

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Figure 1. A 50-year-old mother of two children, having atopic dermatitis since childhood, developed hand dermatitis postpartum that continued to afflict the palms and distal aspects of the fingers.

Skin findings similar to atopy, such as those in prurigo gestationis, are common during pregnancy.³ Pregnancy happens to shift immune response reactions from type 1 helper (Th1) to type 2 helper (Th2) cells to protect the fetus.⁴ Housewife's hand dermatitis may represent the onset of hidden atopy surfacing because of housework. This report focuses on the etiology of the atopic aspect of housewife's hand dermatitis.

HAND DERMATITIS AND CONTACT DERMATITIS

Many patients with housewife's hand dermatitis are allergic to nickel.⁵ Latex contact allergy is also a frequent cause of hand dermatitis because many householders wear rubber gloves while doing household chores.⁶ Vegetables, such as onions, and fruits, such as kiwifruit, are also important factors associated with housewife's hand dermatitis because they contain multiple allergens.²

HAND DERMATITIS AND ATOPIC DERMATITIS

History of atopic dermatitis (AD) increases the risk of hand dermatitis and xerosis;⁷ however, it is unclear whether there exists a difference regarding the onset of atopy-like findings during pregnancy in patients with or without atopic predispositions.

We encountered a 50-year-old mother with two children and childhood AD, which recurred during pregnancy. She continued to experience hand dermatitis postpartum (Figure 1). We also observed hand dermatitis in a 40-year-old childless housewife with atopic history. Although few studies are discovered on the manifestations of atopic findings occurring during pregnancy and postpartum, one report observed that atopic mothers frequently have nipple dermatitis, suggesting the involvement of a maternal atopic predisposition.⁸

TH2 SHIFT AND PREGNANCY

Pregnancy modifies the Th1 homeostasis of nonpregnant state to Th2 state in order to maintain pregnancy, protect the fetus, and ensure successful childbirth.⁴ Although the difference between AD and the so-called "dermatitis" is not clear, it is pointed out that during pregnancy, dermatitis and prurigo similar to AD manifestations may occur.³ Immune checkpoint factors, such as the transcription factor FOXP3 and 15-Deoxy-prostaglandin, which suppress Th1 response, are responsible for this shift in immune response during pregnancy.^{9,10} Although the presence of Th2 is for protecting both fetus and mother, the mechanism of Th2 shift associated with pregnancy requires further investigation.

CONCLUSIONS

The Th2 shift could be restored by childbirth; however, it is common for hand dermatitis to persist even after childbirth. This finding could assist to understand the pathogenic mechanisms of atopy. Actually, housewife's hand dermatitis, the focus of this presentation, is a delayed indication of atopy.

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Sun Exposure in Paradise: Assessment of Sunscreen Use, Tanning, and Sunburning Behaviors in *Bachelor in Paradise* (Season 1 versus Season 8)

Jonathan Xu, MS; Rebecca Krain, MD; Nicholas A. Ross, MD

TO THE EDITOR:

As one of the most popular reality television franchises in the United States, *Bachelor in Paradise* (*BiP*) has gained generational popularity. According to Nielsen ratings, live broadcasts of Season 8 reached an average of 2.372 million viewers on Tuesday primetime. Reality television shows, for better or worse, influence the viewer's real-life behaviors and norms, including those about body image, interpersonal relationships, and even the use of indoor tanning.^{1–3} Although *BiP* provides the audience with both comedic relief and hope of finding love, sun exposure behaviors and attitudes of the contestants could influence the sun protection behaviors of viewers. The role of dermatologists is not only to identify and treat conditions of the skin but also to support skin health and prevent skin cancer.^{4,5}

SKIN CANCER

Governmental and organizational campaigns strive to increase skin cancer awareness and safe sun exposure habits. The ability to provide a positive message to a large, captive audience through reality television shows might be a missed opportunity for primary cancer prevention. This report seeks to quantify tanning behaviors and use of sunscreen at two time points of *BiP*, from the beginning of the franchise spin-off (7, 85-minute episodes in Season 1) to the latest season 8 (16, 85-minute episodes).

We used demographic information, such as contestants' age, gender, and occupations, on the official "Bachelor Nation"

Table 1. Demographics of Seasons 1 and 8 of *Bachelor in Paradise*

	SEASON 1	SEASON 8
Age, mean, years (min–max)	29 (25 min–35 max)	29 (24 min–38 max)
Gender		
Men, n (%)	13 (52%)	20 (47%)
Women, n (%)	12 (48%)	23 (53%)
Occupation		
Arts/entertainment/media	12 (48%)	7 (16%)
Business/management	11 (44%)	23 (53%)
Science/technology/healthcare/education	1 (4%)	11 (26%)
Others	1 (4%)	2 (5%)

available in Wiki. The mean age and gender distributions were similar between Season 1 and Season 8. Although the education levels of all participants were not readily available, occupations were similar between the two seasons. The demographics are detailed in Table 1.

Two evaluators carefully recorded each verbal mention of sun-protective behavior in Seasons 1 and 8, excluding visual representations without dialogue. While Season 1 had no verbal mentions of sunscreen or sunburns, Season 8 featured four instances where the application of sunscreen and concerns for sunburn

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were mentioned. Women contestants were more conscientious about the use of sunscreen and were not portrayed to sunburn in Season 8. All portrayals of sunburn in Season 8 were in male contestants. While not discussed in Season 1, there was a dialogue in Season 8 about a particular contestant's susceptibility to sunburn, given their fair complexion, lack of protective clothing, and lack of sunscreen use. This positive message about sun exposure risk assessment and prevention was overshadowed by a scene depicting a sensualized sunscreen application the a contestant's bare bottoms. This sunscreen application scene portrayed as a mere flirtatious interchange may mock messaging that whole-body sunscreen application is a necessary, nonsensualized, and cancer risk-modifying behavior.

ON TANNING

Unfortunately, both seasons portrayed tans and the act of tanning as positive attributes. This occurred five times in Season 1 and eight times in Season 8. Based on the authors' subjective assessment of skin phototypes, about 60% of the contestants were Fitzpatrick skin types IV–VI, and 40% were Fitzpatrick skin types I–III across both seasons. Despite the nationwide effort placed on educating individuals about sun exposure and its affiliation with the development of skin cancer and premature aging, this message was not emphasized in *BiP*. The fact that the participants appeared less concerned about the risks of tanning may indicate that the current messaging techniques on sun exposure risk mitigation are not impacting equally all members of our society. At heart, sunscreen use in *BiP*'s Season 8 was portrayed as a method of fending off sunburns but keeping the coveted golden tan.

SUN PROTECTION

With no appreciable decline in the annual incidence of skin cancer and the lack of precise and scientific messaging in popular culture, dermatologists must discuss and educate their patients regarding the risks of sun exposure and the risks of tanning. Reality

television shows may serve as an underutilized avenue for patient education about skin cancer because of its broad reach and captive audience. As discussions of photoprotection in some medical settings may be less than effective, the influence of reality television on viewers' real-life behaviors is potentially significant.^{6,7} As reality television shows have significant industry influences with product placement, a balance between sun-protective clothing, sunscreen product placement, and positive messaging about sun avoidance could blend the interests of producers and skin health organizations. Although *BiP* is well positioned as an avenue to provide positive messaging on the prevention of skin cancer, the need for dermatologists' participation in formulating this messaging on reality television is clear.

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BOOK REVIEW

Jennifer L. Parish, MD, Section Editor

Procedures in Cosmetic Dermatology: Soft Tissue Augmentation 5th Edition

J. Carruthers, A. Carruthers, Jeffrey S. Dover, M. Alam, O. Ibrahim, Eds. *Soft Tissue Augmentation*. 5th Edition. Elsevier, Philadelphia, PA; 2024: 392 p, \$109.59.

Aesthetics in dermatology is an ever-developing field, reflecting a rising demand for aesthetic treatments and a broader acceptance of cosmetic procedures. As part of a larger series, “Procedures in Cosmetic Dermatology,” *Soft Tissue Augmentation*, 5th Edition, edited by J. Alastair Carruthers et al., is a comprehensive resource for both experienced dermatologists and novice interested in the field of cosmetic dermatology, specifically soft tissue filler. This edition continues to uphold the high standards of its previous versions. It provides detailed and up-to-date information on the latest techniques and products in soft tissue augmentation.

CONTENTS

The book is organized into several sections, each focusing on different aspects of soft tissue augmentation. Following are the key topics:

Foundations of soft tissue augmentation: This section covers the basic principles, including anatomy, patient assessment, and consultation processes. It is essential for understanding the fundamentals of successful cosmetic procedures.

Materials and products: A detailed examination of the various fillers and products available in the market, including their composition, mechanisms of action, and indications for use. This section is particularly valuable for practitioners to make informed decisions about selection of products.

Techniques and procedures: Step-by-step guide on a wide range of techniques are further demonstrated with high-quality images and videos. This section includes contributions from renowned experts of the field, offering insights into their preferred methods and tips for achieving optimal results.

Complications and management: This critical section addresses potential complications associated with soft tissue augmentation

and provides strategies for prevention and management. This is crucial for ensuring patient safety and maintaining high standards of care.

Future directions and innovations: An exploration of emerging trends and future advancements in the field. This forward-looking perspective is beneficial for practitioners who want to stay ahead of the curve and integrate cutting-edge techniques into their practice.

RECOMMENDATION

The 5th edition of the book stands out for its educational value in several ways. It provides an exhaustive overview of the field, making it an excellent reference for dermatologists at any stage of career. It covers a breadth of soft tissue augmentation from foundational knowledge to advanced techniques. Readers are benefited from the collective wisdom and experience of top practitioners.

In addition, exhaustive photographs, diagrams, and videos significantly enhance the learning experience. This, combined with the content’s practical nature, makes it directly applicable to clinical practice. Each procedure is explained clearly and step by step, allowing practitioners to implement the techniques confidently. The book reflects the latest advancements and trends in cosmetic dermatology, ensuring that readers are well informed about current best practices and innovations of the field.

CONCLUSION

The book is an invaluable resource for the professionals of cosmetic dermatology. Its comprehensive coverage, expert insights, and practical guidance make it a must-have for seasoned professionals as well as novice to the field. By investing in this book, professionals would be able to enhance their knowledge, refine their skills, and ultimately improve patient outcomes.

Reviewed by Saira Agarwala, MD, Department of Dermatology, Lewis Katz School of Medicine at Temple University, Philadelphia, PA

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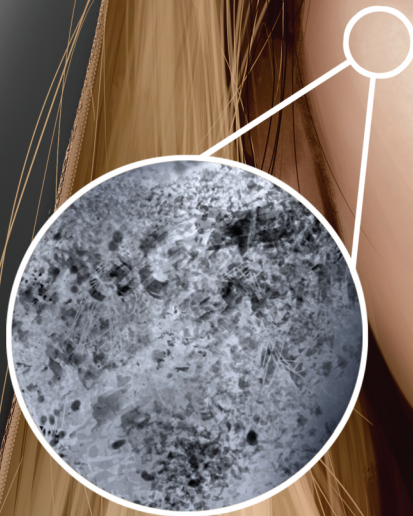


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