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GIULIANI

RICERCA E INNOVAZIONE IN DERMATOLOGIA

VOL. 20
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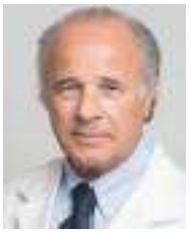

Il concetto di SkinLongevity rappresenta un cambiamento di paradigma nel trattamento dell'invecchiamento cutaneo, promuovendo un approccio scientifico alla cura della pelle. Investire nella salute della pelle attraverso la prevenzione, la rigenerazione e uno stile di vita sano è la chiave per una pelle che non solo appare giovane, ma che invecchia bene, mantenendo la sua vitalità e funzionalità nel tempo. Adottare questa filosofia non è solo una questione di bellezza, ma un vero e proprio investimento nella propria salute cutanea per il futuro.
Attraverso l'ISPLAD, questa visione vuole diventare un punto di riferimento internazionale, guidando un cambiamento di mentalità che vede la cura della pelle non come un lusso, ma come una necessità per il benessere complessivo.
Non si può fermare e andare contro il tempo o porci in modo negativo verso gli anni che passano, è più reale il desiderio di dare più anni alla vita, con una pelle che deve essere aiutata a restare naturalmente giovane e in salute.
Credo che la nostra mission, come medici, non sia l'estetica artefatta ma debba essere soprattutto quella di aiutare la giovinezza naturale, la giovinezza relativa ad ogni età della nostra vita.

Con grande piacere vi informo che da questo numero il **Dott. Andrea Barbieri**, giornalista, Direttore Editoriale TVnumeriuno Rai Eri, assumerà la carica di Vicedirettore Editoriale di JPD. La presenza del Dott. Barbieri sarà molto importante per la crescita e l'affermazione della nostra importante rivista scientifica, soprattutto in un momento in cui la ricerca dermatologica è fortemente in espansione e necessita di importanti e seri mezzi di divulgazione.

The SkinLongevity concept represents a paradigm shift in the treatment of skin aging, promoting a scientific approach to skin care. Investing in skin health through prevention, regeneration and a healthy lifestyle is the key to skin that not only looks young, but ages well, maintaining its vitality and functionality over time.
Adopting this philosophy is not just a matter of beauty, but a real investment in your skin health for the future.
Through ISPLAD, this vision aims to become an international point of reference, driving a change in mentality that sees skin care not as a luxury, but as a necessity for overall well-being.
You can't stop and go against time or be negative about the passing years, the desire to give more years to life is more real, with skin that must be helped to stay naturally young and healthy. I believe that our mission, as doctors, is not artificial aesthetics but should above all be to help natural youth, youthfulness relative to every age of our life.

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CON LE MANI TRA I CAPELLI...

18 Gennaio 2025 Genova

Responsabile scientifica
Marina Romagnoli

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Programma

La dermatologia rappresenta una delle branche più complesse e affascinanti della medicina, in quanto si occupa della diagnosi e del trattamento delle malattie della pelle, dei capelli e delle unghie. Un corso di dermatologia ben strutturato deve quindi riflettere questa complessità e fornire ai partecipanti le conoscenze necessarie per affrontare le sfide moderne.
Il corso in oggetto sarà suddiviso in tre sessioni principali:

- patologie del cuoio capelluto
- tricologia
- aggiornamento sulle normative e gestione dello studio medico

L'obiettivo sarà quello di un aggiornamento sulle novità diagnostiche e terapeutiche.

La prima sessione si occuperà del cuoio capelluto, una regione spesso trascurata nella pratica clinica generale, ma che può presentare una varietà di patologie significative. La prima sessione del corso sarà dedicata a questo argomento cruciale. Verranno approfondite le caratteristiche clinico dermatoscopiche delle malattie infiammatorie e sviluppati i riscontri terapeutici dell'analisi del microbioma del cuoio capelluto.
Si approfondiranno le potenzialità della diagnosi clinica ed eziologica di alcune dermatiti del cuoio capelluto.
Verranno discusse le ultime novità diagnostiche, compreso l'uso della dermatoscopia digitale per la valutazione non invasiva delle neoformazioni cutanee ed affrontate le opportunità meno invasive di riparazione delle lesioni di continuo che si sviluppano dopo la loro asportazione.
Particolare enfasi verrà data alla fotoprotezione mirata.
La seconda sessione sarà dedicata alla tricologia, uno dei campi più dinamici della dermatologia moderna. La caduta dei capelli è una preoccupazione comune sia negli uomini che nelle donne e può avere un impatto significativo sulla qualità della vita dei pazienti.
Saranno esaminati i meccanismi fisiopatologici alla base delle diverse forme di alopecia (androgenetica, areata, da farmaci oncologici) e verranno presentate nuove tecniche diagnostiche e terapeutiche.
Saranno inoltre introdotte terapie emergenti come l'uso delle cellule staminali e della fototerapia led.
Una innovativa prospettiva verrà fornita dalla presa in carico del paziente da parte del dermatologo e del chirurgo che esegue i trapianti e dalla possibilità di intervento con autotrapianto su aree cicatriziali .
La terza sessione riguarderà le mani nei capelli dei partecipanti... ed avrà un carattere più amministrativo ma non meno importante per il professionista moderno.
Riguarderà infatti le linee per districarsi nei meandri dell'applicazione dell'IVA sulle Prestazioni Mediche; e dei Regimi Autorizzativi.
Nozioni fondamentali per garantire che lo studio operi in conformità con le leggi fiscali vigenti.
Verranno forniti esempi sull'uso dei Gestionali nello Studio Medico; e per ultimo, anche se non per rilevanza, sull'ingresso dell'Intelligenza Artificiale nelle nostre vite e nella professione.
L'integrazione di sistemi gestionali efficienti può infatti ottimizzare notevolmente il flusso lavorativo quotidiano e favorire lo scambio di informazioni col paziente ed i colleghi così come, con le dovute precauzioni, può fare l'uso dell'AI.

8:00 Registrazione partecipanti
8:30 Saluti iniziali ed apertura lavori Marina Romagnoli

SESSIONE I IL CUOIO CAPELLUTO E LE SUE INSIDIE
Moderatori Fabio Ayala, Emanuele Claudio Cozzani
9:00 Il microbiota del cuoio capelluto e i suoi risvolti terapeutici Fabio Rinaldi
9:15 Infiammoscopia del cuoio capelluto. Difficoltà cliniche e istologiche Giulio Ferranti
9:30 Dermatite pustolosa erosiva del cuoio capelluto Lucia Brambilla
9:45 Dermatiti da contatto del cuoio capelluto Rosella Gallo
10:00 Alopecia cicatriziale bestia nera del Dermatologo Franco Rongioletti
10:15 Discussione sui temi trattati in precedenza

10:30 Coffee Break

Moderatori Piero Berrino, Giulio Ferranti
11:00 Neoplasie non melanocitarie del cuoio capelluto. Quadri dermatoscopici Paolo Bartalini
11:15 Lesioni pigmentate del cuoio capelluto Giovanni Ghigliotti
11:30 Riparazione delle lesioni difficili del cuoio capelluto Giuseppe Perniciaro
11:45 Alternative alla alla chirurgia ricostruttiva del vertice Piero Berrino
12:00 Discussione sui temi trattati in precedenza

SESSIONE II TRICOLOGIA NEWS
Moderatori Marina Romagnoli, Giuseppe Emilio Cannata
12:15 Terapia medica farmacologica delle Alopecie non cicatriziali Maria Caterina Fortuna
12:30 Le Alopecie del paziente oncologico: prevenzione e terapia Marta Carlesimo
12:45 Terapia autologa rigenerativa in tricologia: mesenchimali da tessuto adiposo. Una tecnica semplice ed efficace Marina Romagnoli
13:00 Tricopat: indicazioni ed efficacia nel telogen effluvium Federico Quadrelli
13:15 Discussione sui temi trattati in precedenza

13:30 Lunch

Moderatori Lucia Brambilla, Giuseppe Emilio Cannata
14:30 Novità terapeutiche AFF e lichen del cuoio capelluto Leonardo Bianchini
14:45 Nuovi orizzonti terapeutici nell'alopecia areata Anna Graziella Burroni
15:00 Alopecia areata in età pediatrica Lodovica Gariazzo
15:15 Il ruolo del dermatologo prima e dopo l'autotrapianto di capelli Piero Tesauro
15:30 Il trattamento chirurgico delle Alopecie cicatriziali pre trattate con terapia autologa rigenerativa Stem e Vol Piero Tesauro
15:45 Galenica tricologica: una questione di genere? Daniela Paolucci
16:00 Discussione sui temi trattati in precedenza

16:15 Coffee Break

SESSIONE III LE MANI NEI CAPELLI DEL PROFESSIONISTA
Moderatori Alessandro Bonsignore, Antonino Di Pietro
16:45 La bellezza ha un prezzo: quando anche l'IVA si rifà il look Valerio Botta
17:00 Studio ed ambulatorio medico e chirurgico. Regimi autorizzativi Giovanni Gianinetti Viano Musso
17:15 Il Gestionale nello studio medico Vincenzo Monno
17:30 Intelligenza artificiale una new entry nella vita e nella professione Matteo Vaccari
17:45 18:00 Discussione, chiusura lavori e compilazione questionario ECM

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Facial Majocchi's granuloma: A case report and review of literature

Marco Virone

Marco Virone[1], Simone Amato[1], Annunziata Dattola[1], Giovanni Pellacani[1]

ABSTRACT

Majocchi's granuloma is a rare cutaneous fungal infection caused by dermatophytes, most commonly Trichophyton rubrum, characterized by a granulomatous inflammatory response in the dermis and subcutaneous tissue. While it predominantly affects hair-bearing areas such as the legs and arms, its manifestation on the face is exceptionally rare. We report a case of a 54-year-old man presenting with Majocchi's granuloma of the face.

The patient exhibited a persistent erythematous, scaly plaque with follicular involvement on his cheek, which had been misdiagnosed as tinea barbae and treated unsuccessfully with topical antifungals. The utilization of dermatoscopy revealed specific features indicative of a dermatophyte infection, including perifollicular scaling and hair shaft abnormalities. Subsequent mycological culture confirmed the presence of Trichophyton spp.

This case underscores the importance of dermatoscopy and mycological culture in the accurate diagnosis of Majocchi's granuloma, particularly in atypical locations such as the face. Early and precise identification of the causative organism is critical in guiding appropriate antifungal therapy, thereby preventing unnecessary treatments, and reducing patient morbidity. This report aims to raise awareness of this uncommon presentation and highlights the diagnostic advantage provided by dermatoscopy and culture examination in managing facial Majocchi's granuloma.

KEYWORDS

Dermoscopy, Drug therapy, Majocchi's granuloma, Wood's light

INTRODUCTION

Majocchi's granuloma is a rare and often underreported dermatological condition that represents a unique subset of dermatophytic infections.

It's characterized by the presence of fungal elements in the dermis and subcutaneous tissue. This granulomatous inflammatory response is typically induced by dermatophytes, particularly Trichophyton rubrum. (Kanaan *et al.*, 2015; Boral, Durdu and Ilkit, 2018)

While it commonly affects hair-bearing areas such as the legs and arms, its occurrence on the face is notably unusual and poses distinct clinical challenges.

Facial involvement in Majocchi's granuloma can often be misdiagnosed due to its atypical presentation, mimicking other dermatological conditions such as bacterial folliculitis, lupus, or even cutaneous neoplasms. (Boral, Durdu and Ilkit, 2018) This misdiagnosis can lead to inappropriate treatment and prolonged patient morbidity.

The aim of this article is to provide a comprehensive overview of Majocchi's granuloma with a focus on the facial manifestation. We focus on the diagnostic difficulties and the importance of proper management through the establishment of early and appropriate treatment.

[1] Dermatology Unit, Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, University of Rome, "Sapienza", Rome, Italy

Case Report

We present a case of a 54 year old man, in good general clinical condition, with no relevant remote pathological history, who reports appearance of erythematous lesion on the cheek, approximately 12 months ago. For this disorder, he report that he was prescribed with terbinafine 250 mg 1cp/day for 2 weeks and clotrimazole 1% cream to be applied 2vv/day for 2 weeks, with no benefit; he also reported worsening redness after shaving and after application of topical steroid creams.
On follow up visit, clinical and dermatoscopic photos were acquired.

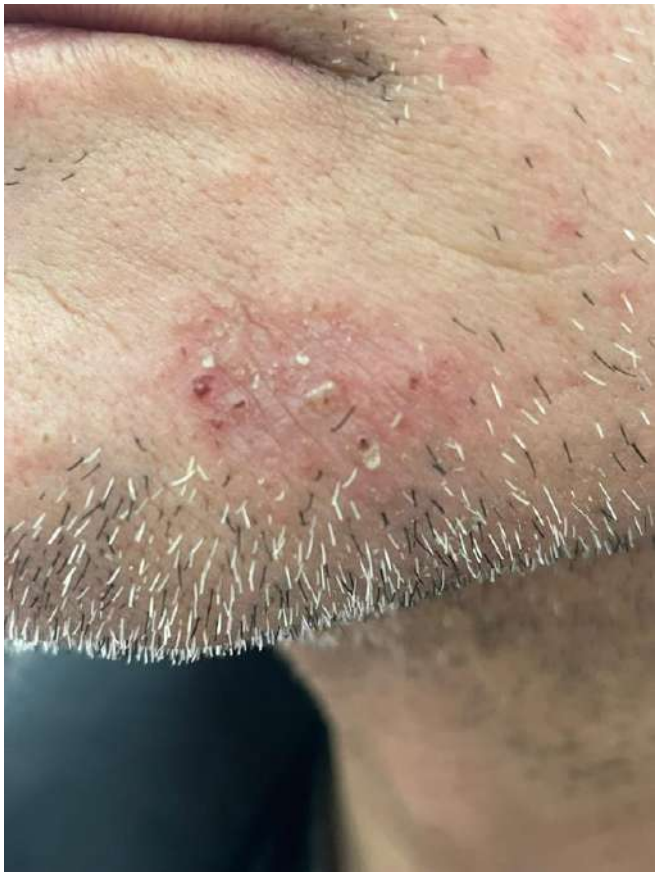
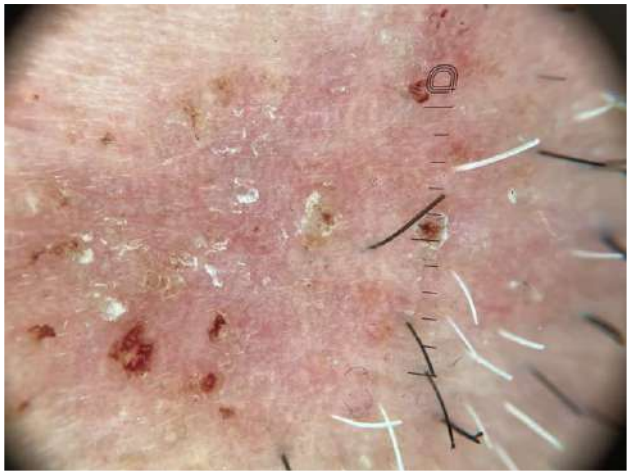


Figure 1
Erythematous plaque with scaling and superficial erosions

Clinically, the presence of single lesion near the chin region is appreciable, erythematous, with blurred margins, also presents fine central and peripheral desquamation of yellowish-white color and presence of serum-hematous crusts.
Numerous follicle-centered papulo-erythematous lesions on the patient's cheek are also appreciated.



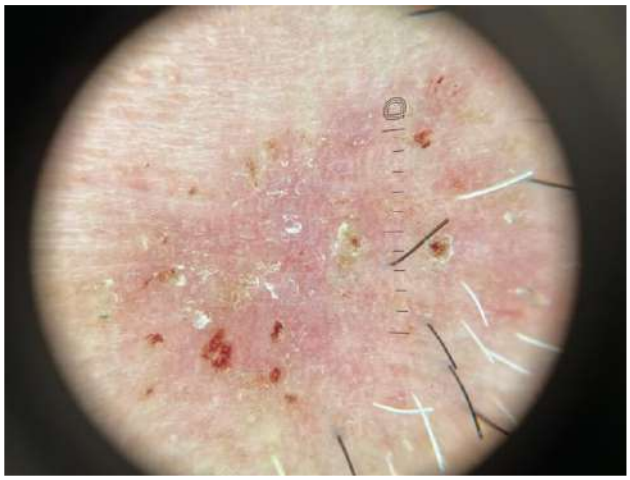


Figure 2
Dermatoscopy of the lesion: an erythematous plaque with superficial scaling and multiple crusts, with diffuse follicular keratin plugs.
A Dermlite DL5 dermatoscope was used for image acquisition.

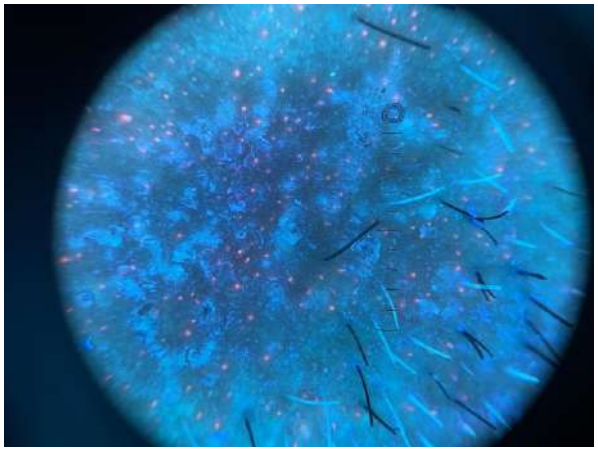


Figure 3 Obsservation with Wood's light.
A Dermlite DL5 dermatoscope was used for image acquisition.

On dermatoscopic observation, we found the presence of diffuse serum-hematous crusts over the entire lesion, numerous yellowish scales, erythematous lesional fundus with scattered punctiform vessels; increased keratin deposits within the hair follicles are also appreciated. Perilesional skin appears uninjured.
By means of Wood's light, diffuse dark blue to purplish fluorescence can be appreciated, especially at the central region of the lesion; diffuse orange-red fluorescent dots are also appreciated throughout the skin observed in this section.
The clinical observation, the behavior of the lesion, i.e., nonresponsiveness to topical therapy and worsening with local steroid therapy, as well as the long duration and persistence of the lesion itself beyond 12 months, together with the dermatoscopic findings, leaned toward a strong diagnostic suspicion of Majocchi's granuloma of the face.
This diagnostic hypothesis is further supported by recent data in the scientific literature, according to which there has been an increase in cases of Majocchi's granuloma over the past 5 years.
(Boral, Durdu and Ilkit, 2018) In this particular, there has been an increase in cases with facial involvement from 8.9% in 2011 to 28.8% in 2017.
Swabbing with antibiogram of the lesion is prescribed for the patient in order to obtain useful laboratory data for diagnosis and treatment.

The result of this culture test showed fungal counts in excess of 100000 cfu/ml, with identification of the pathogen Trichophyton spp. sensitive only to econazole and itraconazole and resistant to all other antifungals commonly used in mycosis. Having identified the pathogen, and assessed the actual sensitivity to itraconazole, therapy with itraconazole 50 mg 2cp/day was prescribed for 8 weeks with benefit.
Along with os therapy, a face cleanser specifically for fungal infections is prescribed to the patient.
Below are the follow-up photos at 5, 6 and 7 weeks of therapy:

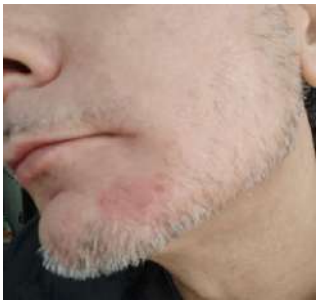


Figure 4
After 5 weeks of therapy

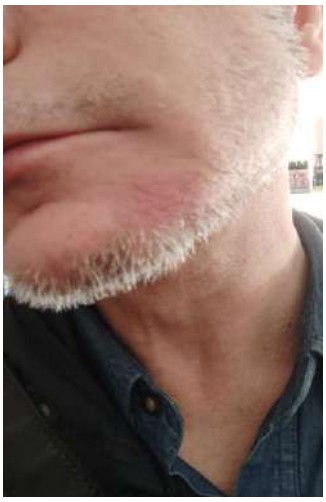


Figure 5
After 6 weeks of therapy

Figure 6
After 7 weeks of therapy

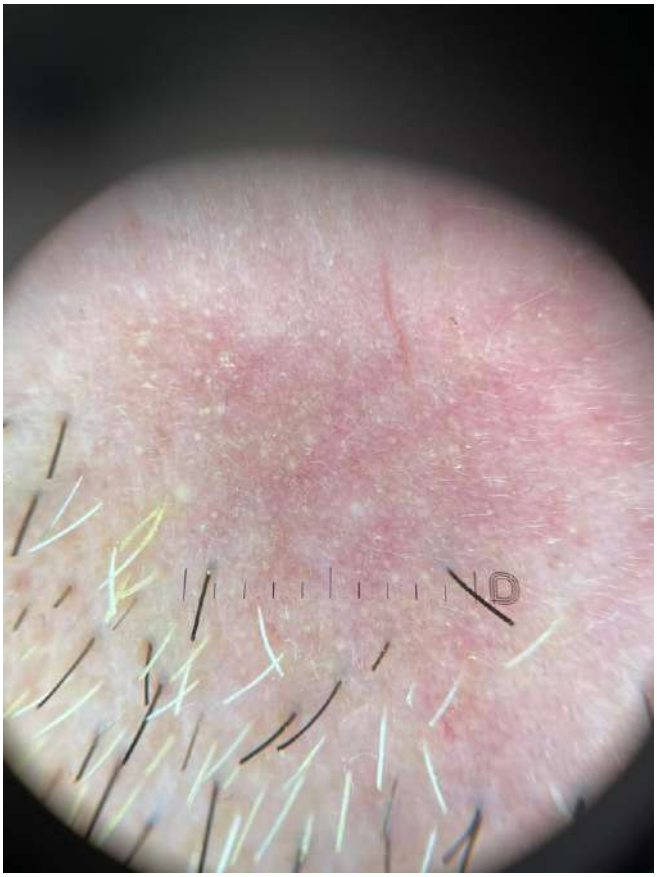


Figure 7
Dermatoscopy of the lesion after 5 week of therapy

The erythema remains, the lesion is still small in size, markedly improved dermatoscopic and clinical appearance, with absence of scales or crusts.
On observation with Wood's light, scattered orange-red fluorescent dots are still appreciable, with a marked and marked reduction of the blue-purple areas present in the center of the lesion before therapy.

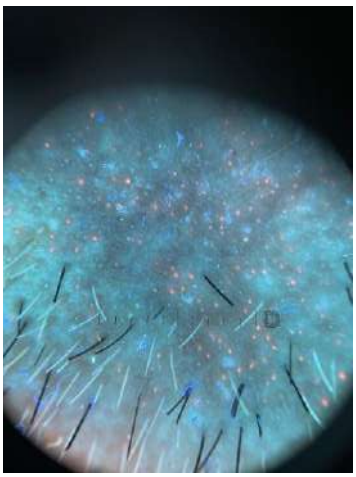


Figure 8
Observation of the lesion with Wood's light after 5 weeks of therapy

Having completed the 8 weeks of therapy, the patient is completely cured.

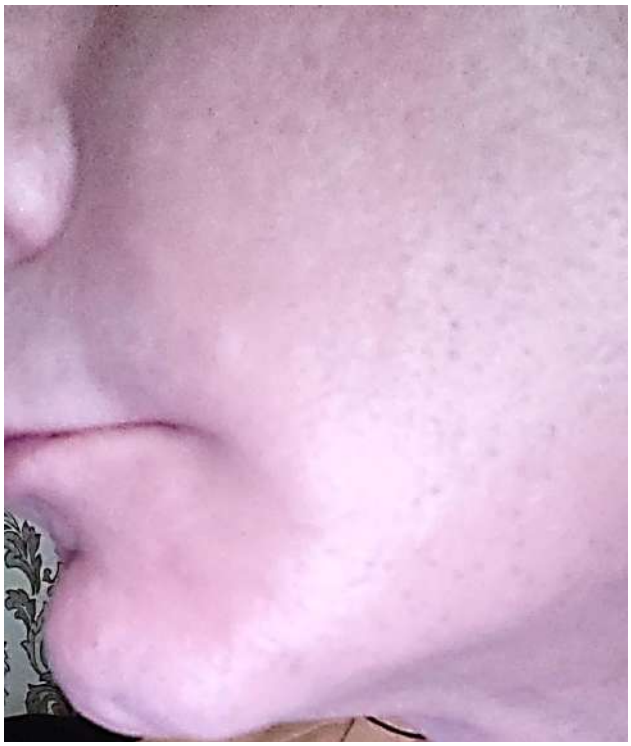


Figure 9
Complete healing after 8 weeks of therapy

Discussion

Majocchi's granuloma (MG) is a rare form of deep fungal infection, determined in most cases by dermatophytes (>95% of cases), i.e., fungi whose nourishment is largely represented by keratin, with a particular predilection for regions rich with hair follicles. Such infection may occur as a result of skin trauma or incorrect use of topical steroids, sometimes as an evolution of a preexisting superficial fungal infection. (Boral, Durdu and Ilkit, 2018)
Dermatophytes sustain themselves by breaking down keratin in nonliving keratinized tissues. However, in Majocchi's granuloma (MG), these fungi must persist in the dermal and subcutaneous layers. The exact mechanisms behind MG pathogenesis remain unclear, but several theories suggest that both host and microorganism factors play a role.
(Nenoff et al., 2014)
The primary host factor is the physical skin barrier that typically prevents fungal infections.

Physical trauma, such as shaving or scratching, and immunosuppression can compromise this barrier, allowing fungal invasion. This disruption permits microorganisms, along with keratin and necrotic material, to penetrate the dermis. To evade the host's immune response, fungi trigger an inflammatory reaction. Fungal LysM domain-associated proteins conceal chitin on the fungal cell wall and regulate fungal growth and development.

Additionally, fungi produce enzymes like lipases, esterases, and collagenases. They also express genes that encode essential glyoxylate pathway components (e.g., isocitrate lyase and malate synthase) and release large amounts of sulfite to break down skin components.

Dermatophytes can cause deep and invasive infections in individuals with certain acquired or congenital immunosuppressive conditions. For example, disseminated dermatophytosis can be linked to lymphopenia, reduced complement C3 and C4, and hypogammaglobulinemia. Moreover, a deficiency in autosomal-recessive caspase recruitment domain-containing protein 9, affecting the signal transducer and activator of transcription 3 pathway and interleukin (IL)-17 and IL-22 secretion, was reported in 17 patients with deep dermatophytosis. (Nenoff et al., 2014; Boral, Durdu and Ilkit, 2018) (Dermatology, 5th Edition Author : By Jean L. Bolognia, MD, Julie V. Schaffer, MD and Lorenzo Cerroni, MD)

Host factors also influence the infection's characteristics. In a patient with pancytopenia, dermal dermatophytosis without granuloma or dermatophyte-related sepsis might occur. However, in a patient with partial immunosuppression, granulomas, abscesses, and mycetoma may develop.

The host employs various mechanisms to control the infection. Antimicrobial peptides such as cathelicidins and defensins protect against fungi and promote epidermopoiesis to clear the infection. Furthermore, natural killer cells, neutrophils, and macrophages respond to dermatophytosis.

Consequently, therapeutic immunosuppression reduces cellular immunity and the capacity to ingest and kill fungal spores. (Millikan, 2010; Nenoff et al., 2014; Boral, Durdu and Ilkit, 2018)

The initial presentation of an erythematous, scaly plaque with follicular involvement on the patient's cheek was misleading and led to an initial misdiagnosis and ineffective topical treatment.

This highlights the importance of considering fungal infections in the differential diagnosis of persistent facial lesions, especially when typical treatments fail.

Dermatoscopy proved invaluable in this case, revealing characteristic features of dermatophytic infection, such as perifollicular scaling and hair shaft abnormalities, which are not easily discernible through clinical examination alone. The use of Wood's light further facilitated the identification of fungal elements, enhancing the diagnostic accuracy.

These tools should be considered essential in the dermatological evaluation of suspected fungal infections.

Moreover, the confirmation of Trichophyton spp through mycological culture was pivotal.

This step not only validated the clinical suspicion but also guided the therapeutic approach.

The subsequent antifungal susceptibility testing ensured that itraconazole was an appropriate choice, optimizing treatment efficacy and patient outcomes.

This case illustrates the necessity of culture and sensitivity testing in the management of dermatophytic infections to avoid unnecessary and potentially harmful treatments.

Itraconazole's success in treating this case of facial MG reaffirms its efficacy as a systemic antifungal agent, especially in cases where topical treatments are insufficient.

The drug's ability to penetrate the dermal and subcutaneous layers is crucial for resolving deep-seated infections like MG.

Conclusion

This case emphasizes the importance of a thorough diagnostic workup, including dermatoscopy, Wood's light examination, and mycological culture with susceptibility testing, for the effective management of Majocchi's granuloma.
These diagnostic tools, combined with targeted antifungal therapy, are essential for successful treatment outcomes.
Clinicians should maintain a high index of suspicion for fungal infections in atypical presentations and rely on comprehensive diagnostic strategies to ensure accurate diagnosis and appropriate treatment.

Review of literature

In our literature search, we found eighteen studies having as their main focus the clinical description, diagnosis or different treatment options of Majocchi's granuloma, considering different anatomical sites
Most of them provide interesting observations on pathogenetic mechanisms, highlighting an epidemiological change and increased presentation of this affliction even in immunocompetent individuals, with an increase in cases of MG of the face. In a summary table we cite six among the eighteen studies analyzed in our literature review, selected for their similarity to our case, their impact in the literature, and their recent publication. Only one of them reports dermatoscopic analysis of Majocchi's granuloma of the face, while none of them shows observations of the lesions by Wood's light.

Table 1. Summary of reported studies for MG.

AUTHORS, YEAR	DERMOSCOPIC EVALUATION	WOOD'S LIGHT EVALUATION	FACIAL INVOLVEMENT	TREATMENT	AIM OF THE STUDY
Khassawneh D, Khodadadi RB, Saleh OA; 2023	No	No	Yes	Terbinafine	Higlight the changing epidemiology of MG
Kanaan ICS, Santos TBP dos, Kac BK, Souza AMV de, Cerqueira AMM de; 2013	No	No	Yes	Griseofulvin	Demonstrate the importance of mycological examination before prescription of topical corticoids
Piccolo V, Brizzi EVD, Russo T, Moscarella E, Diniz T, Alfano R, et al; 2019	Yes	No	Yes	Terbinafie	To show dermoscopic and RCM appearance of MG
Zheng M, Landeck L, Liu C, Cai SQ; 2012	No	No	Yes	Oral itraconazole and topical terbinafine	Considering diagnosis of MG when there is an eczema not responding to corticoids, even in healthy individuals
Khodadadi RB, Vetmar ZA, Montagnon CM, Johnson EF, Saleh OMA; 2023	No	No	Yes	Multiple terapies evaluated	Detailed review of their institutional experience with biopsy-confirmed cases of MG, highlighting clinical, diagnostic, and treatment characteristics as well as short-term outcomes
Tirado-Sánchez A, Ponce-Olivera RM, Bonifaz A; 2015	No	No	No	Multiple terapies evaluated	Focuses on clinical characteristics of MG and diagnosis and therapeutic options of MG.

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Multispectral analysis in laser therapy assessment: a novel approach to tailored dermatological treatments

Simone Amato

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ABSTRACT

Multispectral analysis is a non-invasive imaging technique that enhances laser therapy by providing detailed insights into the vascular, pigmented, and textural components of skin lesions. By identifying chromophores such as hemoglobin, melanin, and water, this method enables precise diagnosis and tailored treatments for conditions like keloids, rhinophyma, and pigmented lesions. Multispectral imaging optimizes therapeutic strategies, improves outcomes, and reduces complications by guiding laser selection and sequencing based on lesion composition and chromophore analysis.
Its application in dermatology, such as preemptively addressing vascular components in keloids or rhinophyma, or identifying hidden vascularity in lentigines, ensures more effective and aesthetic results. The ability to choose appropriate laser wavelengths based on chromophore analysis further refines treatment precision. Despite the need for specialized training and equipment, multispectral analysis represents a significant advancement in personalized dermatological care.
Future integration with other diagnostic tools could enhance its clinical utility, improving both precision and patient satisfaction.

KEYWORDS
Multispectral analysis, Laser therapy, Chromophore targeting, Dermatology imaging, Vascular lesions, Pigmented lesions, Keloid treatment, Rhinophyma, CO_2 laser, Pulsed dye laser (PDL), Non-invasive diagnostics, Personalized dermatological care, Spectral imaging

INTRODUCTION

Laser therapy represents a cornerstone in modern dermatological treatments, leveraging its precision and efficacy to address a wide array of skin conditions. The success of laser therapy hinges on the accurate identification of a chromophore—a molecule capable of absorbing specific wavelengths of light. By targeting these chromophores, lasers induce controlled damage in the intended tissue while sparing the surrounding areas.
Different lasers are employed based on their specific wavelength and the chromophore they target:

- CO_2 lasers (~10,600 nm) target water as their primary chromophore, making them ideal for ablative procedures.
- Vascular lasers, such as pulsed dye lasers (PDL), focus on hemoglobin to treat vascular lesions like telangiectasias or hemangiomas.
- Pigment-specific lasers, including Q-switched and picosecond lasers, target melanin for the removal of pigmented lesions or tattoos.

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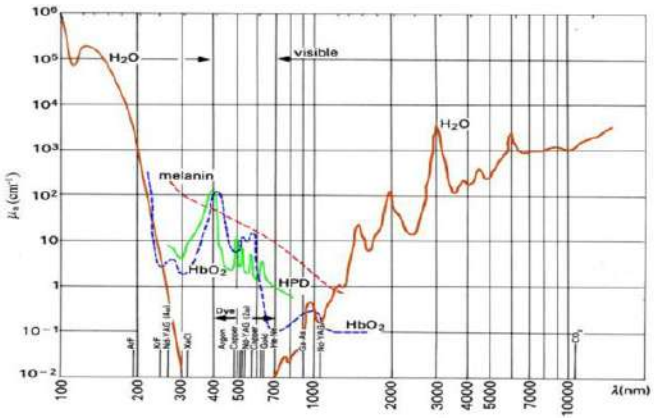


However, the precise identification of lesion composition—vascular, pigmented, or structural—is essential to optimize laser parameters and improve outcomes.

Multispectral analysis, a non-invasive optical imaging method, offers unparalleled insights into the skin's composition, allowing clinicians to tailor laser therapies with precision. This article explores the integration of multispectral analysis in laser therapy, focusing on its application to vascular, pigmented, and textural components of skin lesions.

Multispectral Analysis: A Non-Invasive Diagnostic Tool

Multispectral analysis is an advanced imaging technique that captures and analyzes images across multiple spectral bands or wavelengths of light. Unlike standard imaging methods limited to the visible light spectrum (approximately 400–700 nm), multispectral imaging extends into the near-infrared range, covering wavelengths up to 2500 nm.

This broad spectrum allows for the detection of radiation beyond what the human eye can perceive.

The technique utilizes highly sensitive sensors capable of detecting subtle differences in how light interacts with various skin components. By sequentially illuminating a region of interest with different wavelengths and measuring the reflected radiation, multispectral analysis evaluates the physical, chemical, and biological properties of the skin.

This process enables the differentiation of key chromophores such as hemoglobin, melanin, and water by analyzing their unique spectral signatures.

In medical imaging, multispectral analysis provides valuable insights into tissue structure and function, assisting clinicians in making more accurate diagnoses and informed treatment decisions

In dermatology, this method has shown significant potential in early skin cancer detection and the assessment of various skin conditions.

The ability to supply detailed information regarding chromophore concentrations, even in deeper tissues, makes it a powerful tool for proper diagnosis.

Compared to other imaging modalities, multispectral systems are relatively simple in operation and cost-effective.

They reduce data redundancy by focusing on a limited number of spectral bands—typically up to ten—thereby streamlining the data processing requirements.

This distinguishes multispectral imaging from hyperspectral imaging, which involves dozens or hundreds of narrow spectral channels and can lead to data overload.

The integration of multispectral analysis in laser therapy enhances the clinician's ability to identify the primary chromophore involved in a lesion.

By understanding whether a lesion has a vascular component, increased pigmentation, or textural irregularities, the appropriate laser type and treatment sequence can be selected.

This tailored approach optimizes therapeutic outcomes and minimizes the risk of adverse effects.

Applications of Multispectral Analysis in Laser Therapy

Vascular Lesions

Multispectral Analysis in Vascular Lesions

Vascular lesions, such as telangiectasias, hemangiomas, port-wine stains, and keloid scars, are characterized by abnormal blood vessel proliferation.

Multispectral imaging allows for precise mapping of these vascular networks by detecting the spectral signatures of hemoglobin.

This detailed visualization enables clinicians to select optimal laser parameters—such as wavelength and pulse duration—to effectively target the vasculature.

Clinical Application in keloids treatment

In the treatment of keloid scars, multispectral analysis plays a crucial role in determining the presence and extent of vascular components within the scar tissue. The procedure involves non-invasive imaging to assess the reflectance and absorption properties of the keloid at multiple wavelengths, identifying areas with increased vascularity.

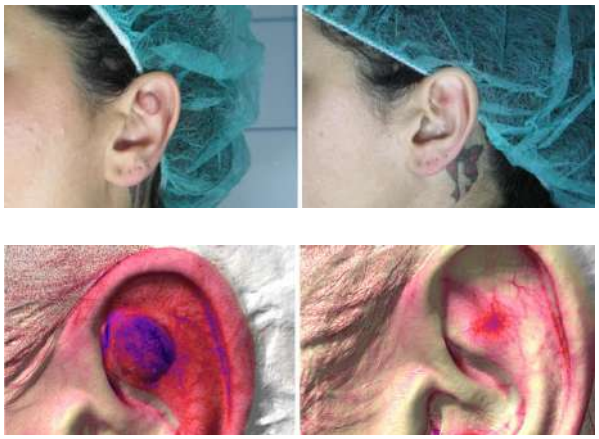
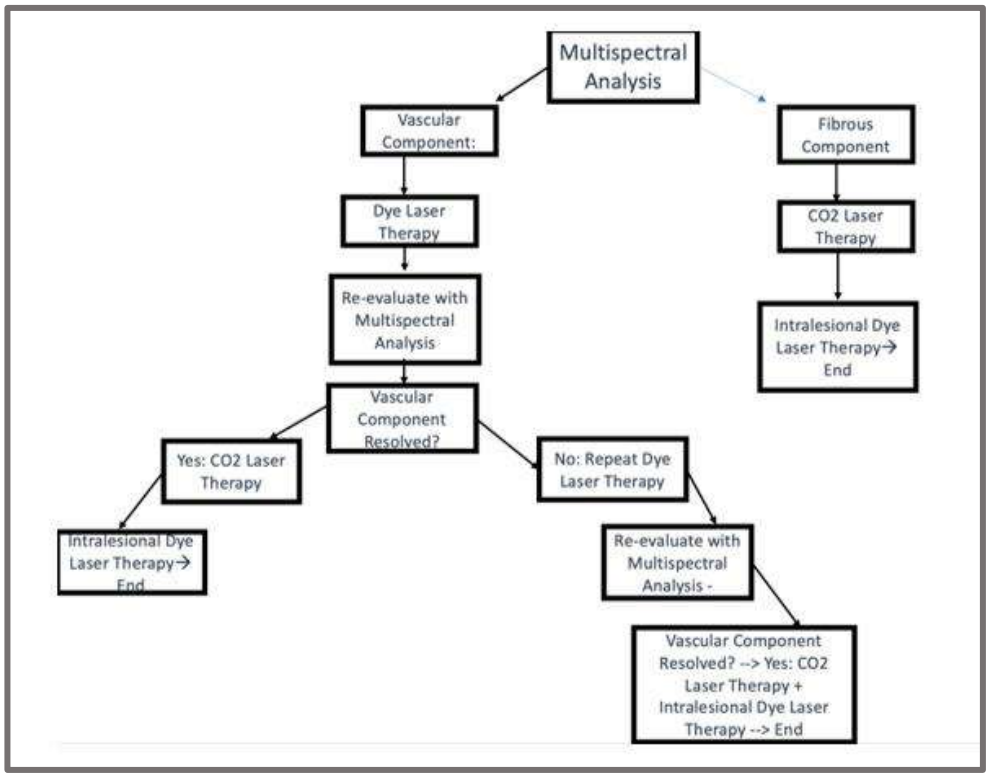


Figure 1
Multispectral analysis: vascular keloid at baseline; keloid after dye laser and CO2 laser.

Treatment Protocol (figure 2):
• Step 1: Multispectral Assessment (figure 1)
• Perform multispectral imaging to evaluate the keloid's composition, focusing on vascular and fibrous components.
• Step 2: Vascular Laser Therapy (if vascular component is present)
• If the keloid exhibits significant vascularity, initiate treatment with a pulsed dye laser (PDL) to target and reduce the blood vessels within the scar.
• After approximately 40 days, re-evaluate the scar using multispectral analysis.
• If vascularity persists, repeat the PDL treatment.
• Step 3: Ablative CO_2 Laser Therapy
• Once the vascular component has been adequately addressed, or if the initial assessment shows minimal vascularity, proceed with ablative laser therapy using a CO_2 laser.
• The CO_2 laser ablates the fibrous tissue of the keloid, promoting remodeling and flattening of the scar.

Figure 2



Multispectral Analysis in Rhinophyma

Rhinophyma is an advanced form of rosacea characterized by the overgrowth of sebaceous glands and connective tissue on the nose, resulting in significant deformity and functional impairment. Multispectral analysis plays a vital role in assessing the vascular and glandular components of rhinophyma, which is crucial for determining the most effective treatment strategy.

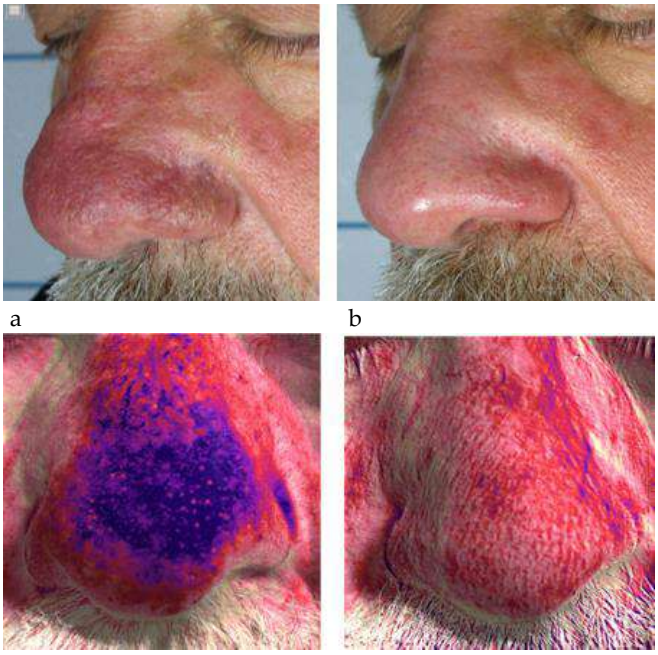


Figure 3:
Multispectral analysis: (a) vascular rhinophyma at baseline; (b) rhinophyma after dye laser and CO2 laser.

Clinical Application

The treatment approach for rhinophyma is guided by the findings from multispectral imaging:
• Step 1: Multispectral Assessment
• Conduct multispectral imaging to evaluate the nasal tissue, identifying the presence and extent of vascular components and glandular hypertrophy.
• This non-invasive assessment helps to distinguish whether the vascular component is predominant or if the condition is mainly due to glandular overgrowth.
• Step 2: Treatment Based on Vascular Component
• If a Significant Vascular Component is Present:
• Begin treatment with vascular laser therapy to target and reduce the blood vessels contributing to the rhinophyma.
• After an initial session, re-evaluate the patient using multispectral imaging approximately 15 days later.
• If vascularity persists, repeat the vascular laser treatment.
• Once the vascular component has been adequately addressed, proceed to the next phase of treatment.
• If Minimal Vascular Component is Detected:
• If multispectral imaging shows minimal or no significant vascularity, proceed directly to ablative laser therapy without prior vascular treatment.
• Step 3: Ablative Laser Therapy
• Utilize ablative laser therapy, such as CO_2 laser, to remove excess glandular tissue and reshape the nasal contours.
• This approach allows for precise sculpting of the nasal architecture, improving both the functional and aesthetic aspects.
• The treatment focuses on ablating hypertrophic tissue while preserving surrounding healthy structures.
• Step 4: Enhancement of Skin Texture
• Following ablative treatment, additional laser therapy may be employed to improve skin texture and promote uniform healing.
• This step enhances the overall cosmetic outcome, contributing to a more harmonious facial appearance.

Multispectral Analysis in Pigmented Lesions

Pigmented lesions, such as lentigines, nevi, melasma and solar lentigo (**Figure 3**) involve an overproduction or abnormal distribution of melanin within the skin.
Multispectral imaging (**Figure 4**) not only differentiates between various types of pigmentation and assesses lesion depth but, more importantly, detects the presence of underlying vascular components. This capability is crucial because the presence of vascularity beneath a pigmented lesion can significantly influence the treatment approach.

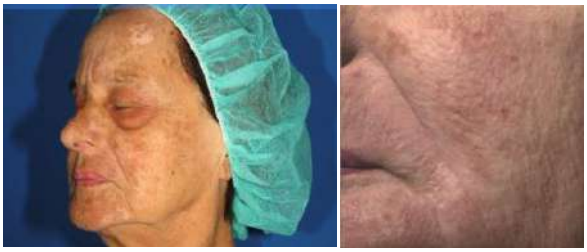


Figure 3: Pigmented spot, clinical and multispectral images

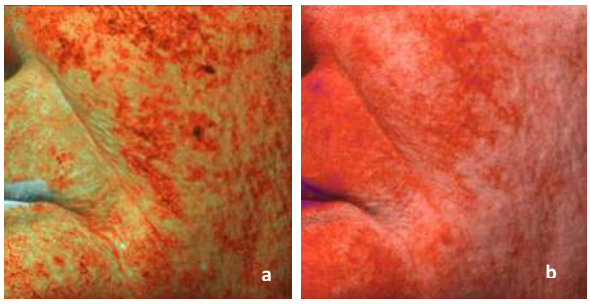


Figure 4: vascular and pigment components at multispectral analisys before (a) and post (b) treatment.

Discussion

The integration of multispectral analysis into laser therapy represents a significant advancement in personalized dermatological care. By providing detailed insights into the skin's vascular, pigmented, and textural components, clinicians can make more informed decisions regarding laser selection and treatment sequencing, thereby enhancing therapeutic efficacy and reducing complications.

In the treatment of scars, especially auricular keloids, identifying the vascular component before initiating laser therapy is crucial. Multispectral analysis enables the detection of underlying vascularity, allowing clinicians to first address this component with vascular lasers.

This approach reduces scar thickness and vascularity, improving the effectiveness of subsequent ablative treatments and decreasing the likelihood of recurrence.

Similarly, in managing rhinophyma, targeting the vascular component prior to ablating glandular tissue is essential for optimal results. Multispectral analysis reveals the extent of vascularity within hypertrophic nasal tissue.

By treating the vascular aspect first, clinicians minimize intraoperative bleeding and enhance the precision of subsequent CO_2 laser ablation of glandular overgrowth, leading to better aesthetic and functional outcomes.

For solar lentigines, which are commonly requested for laser therapy, an initial dermatoscopic assessment is vital to exclude malignant lesions unsuitable for laser treatment. After confirming benignity, multispectral analysis helps identify any underlying vascular components.

If vascularity is present, it should be treated first with vascular lasers before addressing the pigmented component.

This sequential treatment enhances efficacy and reduces the risk of adverse effects or recurrence.

In summary, multispectral analysis significantly improves laser therapy by allowing for tailored treatment plans based on comprehensive lesion assessment.

It enhances diagnostic accuracy, optimizes therapeutic strategies, and leads to higher patient satisfaction with fewer treatment sessions.

While challenges such as equipment costs and the need for specialized training exist, the benefits of incorporating multispectral analysis into clinical practice underscore its value in advancing dermatological care.

Conclusions

Multispectral analysis represents a significant advancement in dermatological laser therapy, offering clinicians enhanced diagnostic capabilities through detailed insights into the vascular, pigmented, and textural components of skin lesions.

This non-invasive imaging technique enables precise identification of chromophores, allowing for the customization of laser treatments to the individual characteristics of each lesion.

Such personalization optimizes therapeutic outcomes, improves patient satisfaction, and aligns with the evolving paradigm of individualized patient care.

Despite challenges like the need for specialized equipment and training, the integration of multispectral analysis into clinical practice offers substantial benefits that outweigh these obstacles.

As technological advancements make imaging systems more accessible and user-friendly, the adoption of this approach is likely to expand.

Future research should focus on broadening its applications and integrating multispectral analysis with other diagnostic modalities to enhance its clinical utility further.

In summary, multispectral analysis enriches the diagnostic and therapeutic landscape of dermatology by enabling more precise and effective laser treatments. Embracing this methodology holds the potential to significantly improve outcomes in dermatological practice.

Continued investment in research, technological development, and clinician education will be essential to fully realize the benefits of multispectral analysis in laser therapy.

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Febrile ulceronecrotic Mucha-Habermann disease after covid vaccination

Simone Amato

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ABSTRACT

Febrile ulceronecrotic Mucha-Habermann disease (FUMHD), is a rare and sometimes lethal form of pityriasis lichenoides et varioliformis acuta (PLEVA) (Degos R, 1966). The presentation of FUMHD is widely variable with key features such as intermittent high fevers, the acute occurrence of papules and erythematous plaques that evolve into generalized ulceronecrotic, hemorrhagic lesions, and histopathology suggestive of PLEVA (Bowers S, 2006; Nofal A, 2016; Virdi SK, 2010; Lalevee S, 2018). Unlike PLEVA, FHMHD is characterized by systemic symptoms, including abdominal pain, diarrhea, arthritis, lung involvement, central nervous system (CNS) symptoms, and sepsis (Warshauer B,1983; Sotiriou E,2008; Fernandes NF,2010). The etiology is often unknown, but it is hypothesized that FUMHD may be the result of a hypersensitivity reaction after an infection (Tsai KS,2001; Yanaba K, 2002). Diagnosing FUMHD in adults can be difficult since it is not well known, cannot be confirmed by diagnostic testing, and can mimic other diseases (Nofal A,2016; Lalevee S,2018). Here, we describe a diagnostically challenging case of FUMHD in an 11-year-old child who received multiple dermatological evaluations before a diagnosis of FUMHD was confirmed and successfully treated with corticosteroids and immunoglobulins.

KEYWORDS

Febrile ulceronecrotic Mucha-Habermann disease (FUMHD), Pityriasis lichenoides et varioliformis acuta (PLEVA), COVID-19 vaccination Systemic symptoms, Fever, Respiratory failure, Sepsis, Corticosteroids and immunoglobulins

CASE REPORT

A previously healthy 11-years-old patient presented with a cutaneous eruption characterized by multiple small, crusted papules and plaques involving areas of the trunk, abdomen and extremities, associated with pruritus, after a messenger RNA (mRNA) vaccine against COVID-19.

The first systemic symptom was fever (38 C°), followed by respiratory failure and an important worsening of the skin condition.

Systemic symptoms immediately characterized the deafness of the condition: the presentation was of sepsis with persistent fever and respiratory failure; therefore, blood cultures and antibiotic therapy with trimethoprim-sulfamethoxazole, teicoplanin, and ceftazidime pentahydrate in continuous infusion were started. At the same time, the patient was put into parenteral nutrition and Non-invasive mechanical ventilation (NIV) with an Opti-Flow FiO2 0.28.

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Blood cultures were positive for pseudomonas aeruginosa and candida parapsilosis, caused by the Picc line on the left arm; then it was administered therapy with trimethoprim-sulfamethoxazole, Teicoplanin, and ceftazidime pentahydrate, tobramycin, caspofungin, voriconazole, and miconazole oral gel. For hyponatremia and anemia fluid therapy and blood bags were administered.

After 3 days, despite therapy, lesions further evolved into confluent pustulovesicles, eroded papules, plaques, crust, haemorrhagic bullae, and macerated, eroded plaques on the face and trunk (Fig. 1) and hand (Fig 2.) Additionally, he developed erosions on her dorsal tongue and genitals. Given the progression, the patient was transferred to the burn unit and methylprednisolone 4 mg per day was administered. After a week, the clinical conditions improved, and oral feeding was resumed.

Respiratory failure was optimally controlled, but blood cultures were still positive, so antibiotic therapy was maintained, and methylprednisolone was reduced from 4 to 2.5 mg per day. After the improvement of the systemic symptoms, there was an increase of vesicular-crusty lesions on the skin surface, therefore a therapy with intravenous immunoglobulin boluses was started. Haemocultures were negativized, the formed eschars have been removed, and methylprednisolone therapy at 2.5 mg per day was continued.

After the 20th day of hospitalization, the conditions were stable and markedly improved, the skin lesions in clear improvement, hence a scaling therapy with prednisone was administered and the patient was discharged.

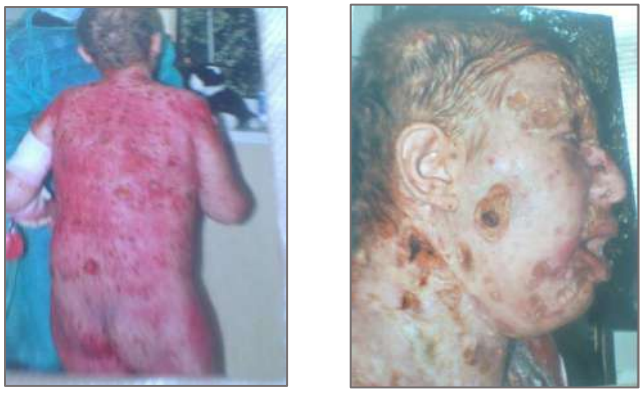

Figure 1
Crusted macerated and eroded plaques on face and

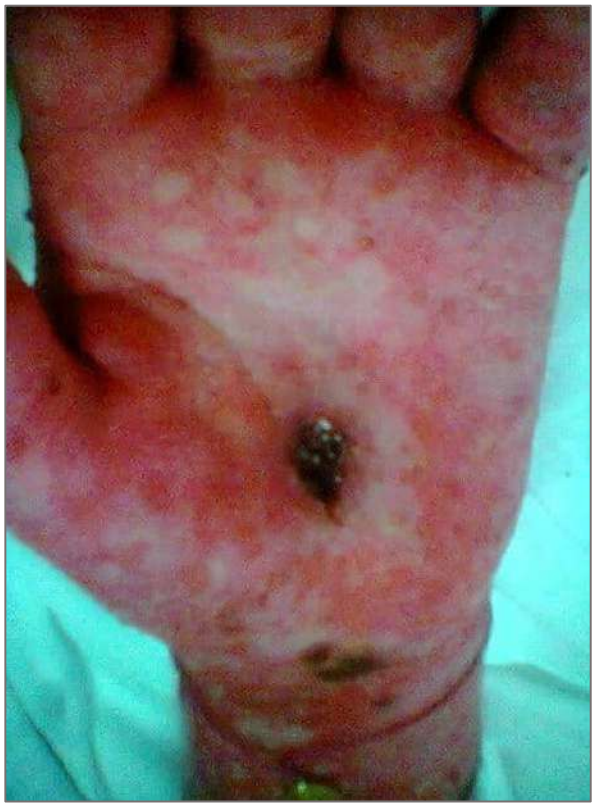

Figure 2
Eroded haemorrhagic bullae on right palm

Pityriasis lichenoides chronica (PLC) is recognized as the most common form of this dermatological condition in the general population.

However, numerous studies have highlighted that Pityriasis Lichenoides et Varioliformis Acuta (PLEVA) is the variant most frequently observed in pediatric patients (Romaní J, 1998). An analysis of documented cases of Geller et al. 2015, including the case presented in this study, reveals that approximately half of the cases involve pediatric patients aged between 34 months and 18 years, while a larger proportion is noted in individuals under 35 years of age at the time of diagnosis (3).

The prognosis for children appears favorable, with no fatalities reported in the pediatric population. A variety of treatment modalities have been proposed for fever-associated ulcerative mucosal hypersensitivity dermatitis (FUMHD), including acyclovir, dapsone, antibiotics, methotrexate, high-dose corticosteroids, and cyclosporine (Degos R, 1966; Fernandes NF, 2010; Tsianakas A, 2005).

However, the use of combination therapies complicates the assessment of the efficacy of individual agents.

While Degos et al. initially reported a therapeutic benefit of systemic corticosteroids, subsequent studies have not consistently validated this finding. Another treatment option, intravenous immunoglobulin (IVIg), has shown variable outcomes.

A case report by Pyrpasopoulou A. in 2007 described a 17-year-old female patient with FUMHD who experienced significant improvement following combination therapy with steroids, IVIg, and methotrexate.

Remarkably, her skin condition improved within two days of IVIg administration, with no new lesions or fever observed by the time of the second dose.

Similarly, in the case presented here, the patient's skin lesions resolved, and fever subsided after the first IVIg treatment, administered following corticosteroid and antibiotic therapy. Although the precise mechanism of action of IVIg remains unclear, its favorable safety profile and demonstrated efficacy in select pediatric cases support its potential use in this condition.

Despite the unknown etiology in most instances, three primary theories regarding the pathogenesis of PLC have been proposed (Bowers S, 2006).

The first suggests an inflammatory reaction triggered by extrinsic antigens, such as infectious agents including Epstein-Barr virus, HIV, cytomegalovirus, parvovirus B19, Toxoplasma gondii, Mycoplasma, and Staphylococcus. Additionally, drug-induced reactions (e.g., hormonal therapies with estrogen-progesterone or chemotherapeutics) and vaccine-related triggers (e.g., MMR—measles, mumps, and rubella) have been implicated.

The second hypothesis proposes a lymphoproliferative origin, characterized by a loss of mature antigen-specific T cells (CD2, CD3, and CD5) in PLC, alongside clonal T-cell proliferation observed in approximately 50% of PLEVA cases.

This phenomenon has been linked to conditions such as Hodgkin's lymphoma, lymphomatoid papulosis, and a possible component of immunocomplex-mediated vasculitis (Bowers S, 2006).

Diagnosis of PLC is based on clinical evaluation and histopathological examination, which varies depending on whether the condition is in the acute or chronic phase.

Common histopathological findings include a dense, wedge-shaped lymphocytic infiltrate (lichenoid) with prominent lymphocytic exocytosis into the epidermis, neutrophil margination within dermal vessels, and the presence of histiocytes. Immunohistochemistry may reveal CD30+ lymphoid cells, which, although nonspecific, can aid in the diagnosis of lymphomatoid papulosis.

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Gestione clinica del prurito in età pediatrica in pazienti con patologia dermatologica
Clinical management of itching in pediatric age in patients with dermatological pathology

Elena Sammarco

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ABSTRACT

Itching is the main, constantly present symptom and is of variable intensity, associated with pain and /or burning, and generally worsen at night causing sleep disturbance in main dermatological disease. Pruritus can occur in different clinical forms depending of the age of the child, the chronicity of symptoms, triggers factors.
Perilla Frutescens is a useful pharmaceutical and food product and is consumed by Humans for its anti-inflammatory and anti-itching pruritus. Perilla leaves have shown therapeutic efficacy in the treatment of inflammatory disorders an systemic damage due to free radicals.
We have used Perilla oil in oral drops in 120 patients with different dermatological disease and pruritus

KEYWORDS
Perilla leaves, itch, skin disease, scratching behaviour, anti-inflammation

INTRODUCTION

Il prurito è una sensazione cutanea fastidiosa che induce il paziente al grattamento talvolta risulta incontrollabile e associato a disturbi del sonno. Molte sono le patologie dermatologiche e sistemiche che si presentano con il prurito tra queste le più frequenti sono Dermatite atopica (DA), Lichen ruber planus, Scabbia, Dermatite irritativa da contatto (DIC), Dermatite allergica da contatto (DAC), Eczema, Orticaria, ecc.
La classificazione del prurito localizzato e/o generalizzato può aiutare il clinico nella diagnostica differenziale così come l'accurata anamnesi ed esame obiettivo di tutto l'ambito cutaneo.
A seconda della patologia di base cambiano i meccanismi patogenetici e con essi il coinvolgimento di numerose sostanze chimiche, tra cui istamina, leucotrieni, linfociti, macrofagi che attivano la risposta infiammatoria e/o allergica.
Nella dermatite atopica il prurito è dovuto a varie cause tra cui il danno di barriera, la disreattività immunologica della patologia e meccanismi neuronali periferici che scatenano crisi pruriginose con coinvolgimento della qualità del sonno.

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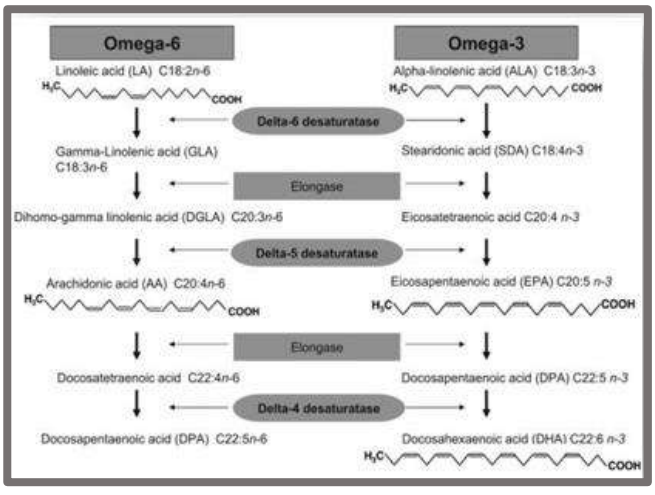
Nella scabbia invece il prurito è determinato dall'acaro stesso che scava dei cunicoli negli strati superficiali della cute rilasciando sostanze urticanti.
Dopo 4-6 settimane dall'infestazione il paziente può sviluppare una reazione allergica di IV tipo dovuta alla presenza di proteine e feci degli acari nei cunicoli che provoca la sintomatologia cutanea.
In tutti i casi di prurito cronico da infiammazione e/o infestazione abbiamo utilizzato l'olio di Perilla derivato dalla Perilla Frutescens in piccoli pazienti affetti da patologie cutanee croniche pruriginose, dai semi si estrae un olio ricco di acidi grassi polinsaturi, in particolare di α-3 (70% è acido linolenico ALA).
L'olio è usato in Asia in campo alimentare, analogamente all'olio di sesamo al quale assomiglia sia per composizione, sia per le caratteristiche sensoriali.
L'acido linolenico (**Figura 1**) è uno dei due acidi grassi essenziali che gli esseri umani e altri animali devono assumere con gli alimenti per mantenere uno stato di buona salute; ciò perché gli organismi lo richiedono per i vari processi biologici, ed anche perché non può essere sintetizzato, in modo endogeno, dagli stessi organismi ma occorre assumerlo con gli alimenti.
Presentiamo uno studio osservazionale spontaneo sull'utilizzo di un integratore a base di Olio di Perilla in una popolazione pediatrica affetta da malattie dermatologiche e prurito.

Figura 1

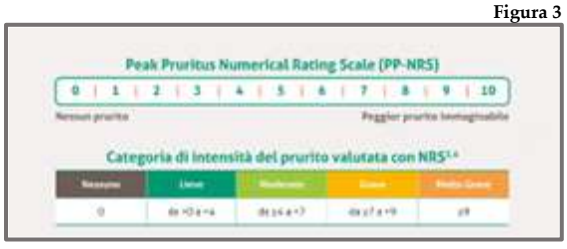


Materiali e Metodi

Abbiamo trattato 120 pazienti di età comprese tra 6 mesi e 14 anni affetti da dermatite atopica (55 pazienti), Eczema disidrosiforme (10 pazienti), Orticaria cronica post infettiva (15 pazienti), scabbia (15 pazienti), DIC e Dermatite frizionale primaverile (5 pazienti), Psoriasi (20 pazienti).
I pazienti 45 maschi e 75 femmine sono stati divisi in 4 f asce di eta': 35 pazienti tra 0 e 3 anni, 40 pazienti 4-8 anni, 25 pazienti 9-12 anni e 20 pazienti 13-15 anni. Si è prescritto utilizzo di Olio di Perilla in gocce in base all'età dei piccoli pazienti in associazione a blande terapie emollienti topiche e detergenti delicati per 2 -3 mesi a seconda della patologia in atto al momento del reclutamento.
Per ciascun paziente è stata raccolta accurata anamnesi personale e familiare, sono stati valutati dati anagrafici, localizzazione dei sintomi ed eventuali comorbidità.
Nel corso della visita clinica si è valutato lo stato generale della cute, la presenza di xerosi e/o lichenificazione o pomfi.
Il prurito è stato valutato sulla scale dell'irritabilità con questionario ai genitori per il primo gruppo, da 0 a 3 anni; con il grading delle faccine (**Figura 2**) (come per il dolore in età pediatrica) per il secondo gruppo dai 4 anni ai 7 anni; e con un grading numerico (**Figura 3**), 0-10 (dove zero era assenza di prurito e 10 prurito insostenibile) negli ultimi due gruppi dai 9 anni in poi.

Figura 2

Figura 3



Si è utilizzato lo SCORAD* (**Figura 4**) per i pazienti con dermatite atopica al tempo zero e dopo 4 settimane di terapia
*SCORAD è < di 15 in pz con DA lieve, tra 15 e 40 DA moderata, >40 DA grave.
Veniva effettuata accurata anamnesi personale e familiare per allergie concomitanti e altre patologie dermatologiche, è stata valutata la presenza di comorbidità e la risposta alle terapie pregresse locali e sistemiche.
Veniva effettuato esame clinico e valutazione delle lesioni cutanee in atto.
Veniva prescritto Olio di Perilla in gocce e/o perle a seconda dell'età dei pazienti 5 gocce /die 0-3 anni e 10 gocce /die 4-12 anni, 1 perla /die dai 12 anni per 8 settimane, alla terapia sistemica si aggiungevano emollienti e detergenti su base oleosa.

Risultati

Su 120 pazienti trattati 17 hanno valutato la terapia poco soddisfacente, 9 mediamente soddisfacente, 86 molto soddisfacente con un miglioramento del prurito tra il 60% e l'80%, 8 hanno sospeso la terapia prima dei 2 mesi. (**Figura 5**)

Figura 5

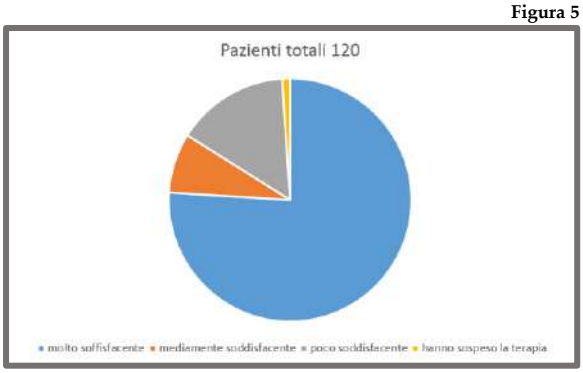
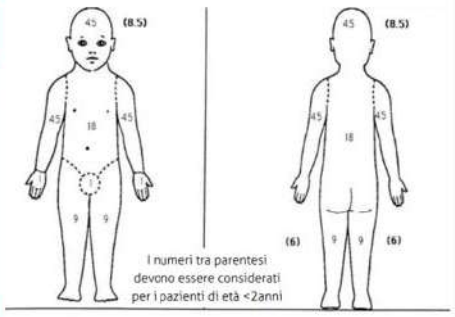


Figura 4

ESTENSIONE: A	INTENSITÀ: B		VALUTAZIONE SOGGETTIVA DEL PAZIENTE: C	
Somma dei numeri corrispondenti alle aree coinvolte (vedere figura a lato)	Somma dei punteggi attribuiti ai seguenti criteri°		Prurito	Sonno disturbato
	Eritema	0 = assenza 1 = lieve 2 = moderato 3 = grave	Valutazione su scala VAS da 1 a 10, in riferimento agli ultimi 3 giorni	Valutazione su scala VAS da 1 a 10, in riferimento alle ultime 3 notti
	Edema/papule			
	Essudazione/croste			
	Escoriazione			
	Lichenificazione			
	Secchezza (nelle aree non coinvolte)			
PUNTEGGIO TOTALE SCORAD = A/5 + 7B/2 + C				



°Ciascuna area selezionata per l'attribuzione del punteggio deve essere rappresentativa, quindi deve corrispondere a un livello medio di intensità dei segni. La stessa area può essere selezionata per l'attribuzione del punteggio di 2 o più criteri. Si sconsiglia di attribuire punti non unitari[1]

VAS, scala analogico-visiva.

1. Simpson EL, et al. JAMA Dermatol 2020; 156(1): 44-56. 2. Stalder J, et al. Dermatology 1993; 186: 23-31.

Discussione

Dall'analisi della letteratura sono emersi numerosi studi che hanno identificato i composti presenti negli estratti vegetali in grado di trattare le malattie della pelle legate al prurito (1).
La Perilla (Perilla Frutescens L.) appartiene alla famiglia delle Lamiaceae ed ha una distribuzione diffusa a livello globale, con una concentrazione particolarmente elevata in Asia, tra cui Cina, Giappone, Corea e Vietnam (2).
I principali costituenti attivi delle foglie di Perilla comprendono flavonoidi, saponine, polisaccaridi, aminoacidi e oligoelementi (1), ed è stato riportato che i flavonoidi esercitano attività antinfiammatorie e antiallergiche sopprimendo la proliferazione e l'attività dei linfociti.
I tre principali costituenti della Perilla sono:
1. L'apigenina (4',5,7-triidrossiflavone), isolata da foglie, steli e semi, è un flavonoide naturale comunemente estratto dalla Perilla frutescens **(Fig. 6**). Questo flavonoide da effetti antidepressivi, antinfiammatori, epatoprotettivi, antitrombotici, antitumorali, antinvecchiamento, antiossidanti, ipolipemizzanti e antiangiogenici.(2)
2. La luteolina (3',4',5,7-tetraidrossiflavone) **(Fig. 7**) è un altro flavonoide, i cui effetti terapeutici sono molto simili a quelli dell'apigenina e comprendono azioni antiossidanti, antinfiammatorie, epatoprotettive, antitumorali e neuroprotettive (2).
Uno studio effettuato in Korea e pubblicato nel 2014 ha e videnziato come la luteolina potesse modulare la produzione di citochine proinfiammatorie come TNF-α e IL-1β, ed inibire, significativamente, il rilascio di istamina (1).
Durante lo studio è stato utilizzato un potente attivatore dei mastociti del tessuto connettivo e/o della pelle.
Pertanto, il comportamento di grattamento causato dall'attivatore può essere influenzato da mediatori rilasciati dai mastociti, come l'istamina. Lo studio ha determinato che la luteolina può ridurre il comportamento di grattamento e la permeabilità vascolare della pelle indotti dai pruritogeni (1).

3. L'acido rosmarinico è un estere dell'acido caffeico e dell'acido 3,4-diidrossifenillattico, noto anche come (2R)-O-Caffeoil-3-(3,4-diidrossifenil)lattato (**Fig. 8**).
È di gran lunga il composto estratto dalla Perilla Frutescens più studiato e ha un ampio spettro di effetti farmacologici dimostrati in studi su animali e in vitro che vanno dalle attività antinfiammatorie e antiossidanti alle attività antitumorali e antimicrobiche. (2)

Figura 6
Apigenina

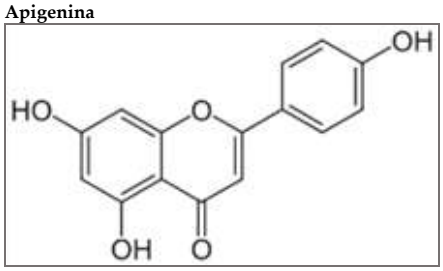


Figura 7
Luteolina

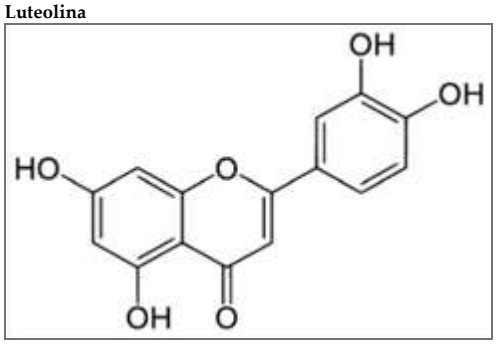
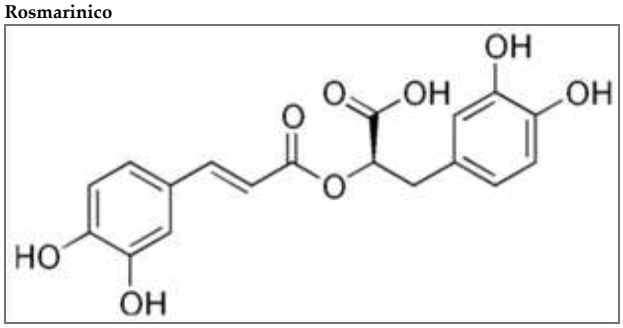


Figura 8
Rosmarinico



Conclusioni

L'utilizzo di nutraceutici in diete personalizzate, con un regime di somministrazione coerente, rappresenta un'altra promettente prospettiva di ricerca. (1)
L'olio di Perilla viene utilizzato da molti anni nella tradizione cinese per il trattamento di numerose patologie, tra cui cefalea, tosse, dolori addominali e reazioni allergiche (4).
I composti derivati dalla Perilla Frutescens hanno dimostrato attività antiallergiche, antinfiammatorie, antiossidanti, antibatteriche l'olio di Perilla somministrato per via sistemica ai dosaggi consigliati ha dimostrato, in numerosi studi clinici, totale tollerabilità sin dai primi giorni di vita.
L'obiettivo raggiunto è stato quello di mantenere una condizione nella quale i sintomi sono risultati meno invalidanti con un intervallo libero da malattia più ampio. I pazienti hanno, inoltre, riscontrato miglioramento della sintomatologia pruriginosa e anche miglioramento della qualità della cute in termini di elasticità e compattezza.

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Sunscreen use and Vitamin D synthesis: balancing skin cancer prevention with nutritional adequacy

Simone Amato

Simone Amato[1], Luigi Bennardo[2], Annunziata Dattola[1]

ABSTRACT

Sunscreen application is a cornerstone in the prevention of skin cancer, effectively mitigating the risks associated with ultraviolet (UV) radiation exposure. Public health initiatives have consistently promoted sunscreen use to protect against harmful UV rays, which can penetrate various barriers and contribute to skin malignancies such as basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. Despite its protective benefits, regular sunscreen use may impede the skin's ability to synthesize vitamin D, a vital nutrient essential for bone health and the prevention of various chronic diseases. This review explores the delicate balance between effective sun protection and adequate vitamin D synthesis, highlighting factors that influence both processes, including skin phototype, geographic location, lifestyle, and environmental conditions. The impact of sunscreen on vitamin D levels remains inconclusive, with studies presenting heterogeneous results influenced by diverse variables. Recommendations to achieve this balance include dietary supplementation, personalized sun exposure strategies, and advancements in sun care technologies that allow for sufficient UVB transmission to facilitate vitamin D production while ensuring protection against harmful UV rays. Additionally, special considerations are necessary for populations at higher risk of vitamin D deficiency, such as individuals with darker skin tones and those undergoing treatments like laser therapy that increase sun sensitivity. Future research should focus on individualized public health strategies and innovative sun protection methods to optimize both skin cancer prevention and nutritional adequacy.

KEYWORDS: **Sunscreen, Skin Cancer Prevention, Vitamin D Synthesis, Ultraviolet Radiation, Photoprotection, Vitamin D Deficiency, Dermatology, Public Health, UVB Radiation, Skin Phototype, Dietary Supplementation, Laser Therapy, Photochemical Reactions, Bone Health, Chronic Disease Prevention**

INTRODUCTION

Sunscreen use is a widely recommended measure to prevent skin cancer. Public health campaigns have emphasized the importance of using sunscreen to protect against harmful ultraviolet (UV) radiation from the sun (Sander et al., 2020; Hung et al., 2022). However, while sunscreen protects against skin cancer, it may also reduce the skin's ability to synthesize vitamin D, which is essential for bone mineralization and other health effects.

Due to the harmful effects of excessive sun exposure—including photoaging and skin cancer—sunscreen use is advised during any exposure to sunlight. UV rays can penetrate clouds, fog, and even light clothing (Serpone, 2021; Glaser & Tomecki, 2020; Rocholl et al., 2021). Moreover, as no sunscreen provides complete protection against UV rays, some risk of skin cancer remains even with sunscreen use. Factors such as individual skin phototype, time of day, environmental conditions, and water or sweat exposure influence the effectiveness of sunscreen. Vitamin D synthesis is optimized by exposing the face, arms, hands, or back to sunlight for 10–15 minutes, twice a week.

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At other times, sun protection—including the use of sunscreen to prevent sunburn—is recommended to reduce the risk of skin aging and skin cancer. Balancing sun protection with adequate vitamin D synthesis involves adopting safe sun practices. The following guidelines aim to help individuals of various skin types reduce the risk of skin cancer while maintaining sufficient serum vitamin D levels (Neville et al., 2021; Shahudin et al., 2020; Holick, 2020).

Importance of Vitamin D for health

Vitamin D is crucial for maintaining overall health and preventing various diseases. Research indicates that low vitamin D levels contribute to osteoporosis, bone fractures, muscle weakness, falls, and certain cancers in adults.

Vitamin D facilitates the absorption of calcium and phosphorus—essential minerals for building and maintaining healthy bones and teeth.

Deficiency in vitamin D can lead to muscle weakness, soft bones, and skeletal deformities, manifesting as rickets in children and osteomalacia in adults.

Despite being considered a historical disease, rickets is re-emerging, with increasing cases reported in some regions of the United States.

Vitamin D also plays a role in preventing and treating various extraskeletal conditions, including acute respiratory tract infections, cardiovascular disease, depression, diabetes, and certain cancers (Polzonetti et al., 2020; Maier et al., 2021; Huang et al., 2022).

Modern diets often lack sufficient vitamin D, as few foods naturally contain this nutrient.

Reliance on sunlight for vitamin D synthesis carries the risk of skin cancer. With increased indoor lifestyles, use of sunscreen, and clothing that covers most of the body, vitamin D deficiency has become prevalent, especially in developed countries (Cui et al., 2023; Cashman, 2022; Pludowski et al., 2022). While excessive sun exposure does not cause vitamin D toxicity due to the body's regulatory mechanisms, it increases the risk of skin cancer. Fortified foods and dietary supplements provide a safe means to increase vitamin D levels. However, some individuals may be reluctant or unable to maintain recommended serum vitamin D levels through these sources.

Skin cancer and the role of sunscreen

The incidence of skin cancer is increasing annually, with ultraviolet (UV) radiation being the primary cause (Leiter et al., 2020; Urban et al., 2021).

UV radiation induces skin inflammation, suppresses immune responses, damages melanocytes responsible for producing protective melanin, induces gene mutations, promotes skin cell proliferation, and initiates processes leading to skin cancer.

Skin cancer primarily manifests as basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. Sunlight exposure is significantly associated with the development of these cancers, especially when exposure occurs before 10–15 years of age in the case of melanoma (Akerlof et al., 2023; Green, 2020).

Regular application of sunscreen with a sun protection factor (SPF) of 15 or greater (ideally SPF 30 or higher) is recommended to prevent skin damage, reduce the risk of skin cancer, and minimize photoaging. A "broad spectrum" sunscreen provides protection against both UVA and UVB rays. Sunscreen should be applied 15–20 minutes before sun exposure and reapplied every two hours, or after swimming or sweating. Additional protective measures include wearing protective clothing, hats, and sunglasses, especially for individuals at higher risk of skin cancer (Dudley et al., 2021; Saindane et al., 2022; Dasari et al., 2020).

Types of skin cancer

Skin cancer refers to malignancies arising from different cell types in the skin, with the three major forms being basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. Basal cell carcinoma, the most common type, originates in the basal cells of the epidermis and rarely metastasizes. It is associated with chronic UVB exposure, particularly in individuals with lighter skin.

Squamous cell carcinoma arises from the squamous cells of the epidermis and can metastasize to other organs

Squamous cell carcinoma arises from the squamous cells of the epidermis and can metastasize to other organs. It often develops from actinic keratoses—patches of sun-damaged skin resulting from repeated UV exposure (Krishnan & Mitragotri, 2020; Arnold et al., 2022; Conforti & Zalaudek, 2021).

While basal and squamous cell carcinomas are associated with chronic UV exposure, malignant melanoma is more closely linked to intense, intermittent UV exposure occurring years before onset. Melanoma originates in melanocytes and is among the ten most common cancers globally, with increasing incidence over the past 30 years, particularly in light-skinned populations. The highest incidence is observed around age 50, with a significant peak in women aged 30–59. White men are twice as likely as women to be diagnosed with melanoma. Unlike basal and squamous cell carcinomas, melanoma can be lethal; however, early detection leads to high survival rates, with a five-year survival rate approaching 100%. Nevertheless, approximately 23% of individuals with invasive melanoma may succumb to the disease (Aggarwal et al., 2021; Dzwierzynski, 2021; Muhammad et al., 2020; Hendi, 2023).

Mechanism of Vitamin D synthesis in the skin

Vitamin D_3 synthesis in the skin begins with 7-dehydrocholesterol in the deeper layers of the epidermis.

Ultraviolet B (UVB) radiation, particularly wavelengths between 290 and 315 nm, induces a photochemical reaction converting 7-dehydrocholesterol to previtamin D_3. Previtamin D_3 then undergoes a thermal isomerization to form vitamin D_3.

Excess UVB exposure can lead to the formation of inactive photoproducts such as lumisterol and tachysterol, preventing vitamin D intoxication (Yin et al., 2024; Danimayostu et al., 2023).

Previtamin D_3 is thermally labile and undergoes isomerization to form vitamin D_3, which can then enter the systemic circulation.

The stratum corneum acts as a barrier, but vitamin D_3 synthesized in the skin can diffuse into the bloodstream.

With excessive UVB exposure, previtamin D_3 and vitamin D_3 can be converted into inactive metabolites such as lumisterol and tachysterol, which do not contribute to vitamin D toxicity.

This mechanism helps regulate vitamin D levels and prevent overproduction (Young et al., 2021; Fiege et al., 2024).

UVB radiation and previtamin D_3 Synthesis

UVB radiation in the wavelength range of 280–320 nm is essential for the synthesis of vitamin D_3 in the skin. Exposure to UVB causes 7-dehydrocholesterol in the skin to absorb photons, leading to its conversion into previtamin D_3, particularly at wavelengths around 295 nm.

This photochemical reaction is rapid and reproducible, and the subsequent thermal isomerization converts previtamin D_3 into vitamin D_3. Previtamin D_3 is thermally converted to vitamin D_3 over approximately two days. If UVB exposure is limited due to cloud cover or other factors, vitamin D synthesis is reduced.

Excessive heat can also lead to the breakdown of previtamin D_3 into inactive photoproducts.

During extended full-body sun exposure, such as at the beach in summer, the skin can produce approximately 10,000 IU of vitamin D_3 with unprotected skin and optimal sun positioning. Even exposure of 50% of the skin surface to UVB can result in substantial vitamin D_3 synthesis. Factors impairing vitamin D_3 synthesis include sunscreen application, increased skin pigmentation, aging, limited sun exposure due to indoor activities, season, and time of day.

The ability to synthesize vitamin D_3 varies among individuals and is significantly influenced by skin phototype.

Melanin pigments, eumelanin and pheomelanin, absorb UVB radiation, reducing the amount available for vitamin D_3 synthesis.

Thus, individuals with darker skin require more UVB exposure to produce the same amount of vitamin D_3 as those with lighter skin (Kallioğlu et al., 2024; Camillo, 2022; Laschewski & Matzarakis, 2022; Julian et al., 2020).

Impact of sunscreen use on Vitamin D levels

It is generally assumed that the use of sunscreens or other photoprotective measures inhibits the skin's ability to produce vitamin D when exposed to sunlight.
Controlled studies using artificial UV exposure in sunbeds have yielded conflicting results regarding the effect of sunscreen on vitamin D synthesis, influenced by factors such as sunscreen type, application thickness, and intervals.
Whether a sunscreen formulation hinders vitamin D production depends on intrinsic characteristics such as skin type.
Few studies have addressed these issues using natural sunlight exposure.
While zinc oxide-containing sunscreens and those with high UVA protection factors are more likely to protect vitamin D production, they may not be more effective in preventing loss of serum 25(OH)D than common sunscreens.
Overall, the evidence incriminating sunscreens in causing vitamin D deficiency is inconclusive (Wu et al., 2024; Feketea et al., 2021; Tuğrul et al., 2023).
Based on UV transmission data, the use of sunscreens with sufficient UVA protection would not support significant vitamin D synthesis, but the potential additive effect is uncertain.
Anecdotal evidence suggests that UV emitted by sunbeds can reach the stratum basale even when sunscreen is applied, varying with different skin types and melanin content.
Increased use of sunscreens may contribute to vitamin D insufficiency, even where sunscreen use is legally mandated in schools and at beaches.
This highlights the need to reassess nutrient reference values for vitamin D. Other strategies to prevent decreases in 25(OH)D levels during colder months include safe sun exposure and increasing vitamin D intake from dietary sources or supplements (de Santana et al., 2022; Mustafa & Shekhar, 2023; Perez, 2021).

Studies on sunscreen use and Vitamin D deficiency

Several studies have explored the relationship between sunscreen use and vitamin D deficiency, with many showing an association between frequent sunscreen application and lower vitamin D concentrations.
However, significant heterogeneity exists in the magnitude and significance of this relationship across studies.
These studies were conducted at various latitudes, typically in the Northern Hemisphere, during different seasons and weather conditions. Skin types varied, and populations included outdoor, indoor, and mixed occupational groups, spanning a wide age range and diverse lifestyles.
This variability reflects the lack of a standard demographic profile for those at risk of vitamin D insufficiency, aside from individuals unlikely to receive adequate vitamin D from supplements. Notably, large population groups with darker skin, such as people from India, may have unknown vitamin D status concerning optimal colorectal cancer prevention, necessitating further research (Leal et al., 2021; Oliver et al., 2023; Vergara-Maldonado & Urdaneta-Machado, 2023).

Factors affecting Vitamin D synthesis and absorpion

Research indicates that exposure to UV light is the dominant determinant of vitamin D status.
At any given latitude, sunlight availability is highly seasonal, affecting when safe sun exposure is achievable. The angle at which sunlight reaches the Earth influences UV radiation penetration through the atmosphere.
Biological factors affecting an individual's ability to synthesize or absorb vitamin D include skin pigmentation, age, and health status. Lifestyle factors, such as time spent outdoors, clothing, and sunscreen use, can hinder skin exposure to UVB radiation.

Global solar UV radiation varies based on region, altitude, azimuth, latitude, and Earth-sun distance. Skin pigmentation strongly affects vitamin D synthesis, with darker-skinned individuals at higher risk for deficiency regardless of geographic location.
Interpersonal variation in environmental conditions and anthropogenic factors negatively contribute to vitamin D status.
Environmental factors include latitude, altitude, and sky-view factor. Biological factors relate to sex, skin pigmentation, age, and body mass index. Lifestyle factors involve occupation, outdoor duration, hobbies, and protective measures like clothing and sunscreen.
Safe sun exposure is personal and depends on time and location. Understanding the interplay of environmental, biological, and lifestyle factors is essential for personalizing strategies to achieve sun protection and vitamin D enhancement (Chalcraft et al., 2020; Ramasamy, 2020; McDonald et al., 2023).

Geographical location and sunlight exposure

Geographical location and leisure habits significantly impact the availability of vitamin D produced in the skin. High UV radiation in equatorial areas results in greater vitamin D synthesis compared to higher latitudes, where UV radiation is lower. Consequently, individuals in higher latitudes may produce less vitamin D.
Seasonal differences, primarily due to changes in daylight length, represent variations in solar potential.
Clear seasons with high solar irradiance facilitate vitamin D synthesis, while overcast seasons reduce it.
During the COVID-19 pandemic, increased time spent outdoors may have influenced vitamin D status by enhancing skin activation. In any region, the ability to form previtamin D_3 and convert it to vitamin D_3 varies based on ecosystem habitats, lifestyles, diet, and clothing
Urbanization, employment, and recreational interests suggest cultural and collective dependencies on seasonal vitamin D.
Public health efforts should be tailored to local populations in different geographical areas (Jovic et al., 2020; Lorensia et al., 2022; Ivakhnenko & Ivakhnenko, 2023).

Recommendations for balancing sunscreen use and Vitamin D synthesis

To balance effective sunscreen use with adequate vitamin D synthesis, several strategies can be adopted:

- **First**, focus on dietary sources or supplements of vitamin D to reduce the need for sunlight exposure to 1–2 minimal erythemal doses per week.

- **Second**, adjust diet and lifestyle to enhance vitamin D status, further reducing the time commitment while maintaining photoprotection.

- **Third**, personalize dietary supplementation based on healthcare professional recommendations.

- **Finally**, consider reducing time spent increasing UV exposure or decreasing photoprotection to align with individual preferences.

Research indicates that limited sun exposure at key times, such as midday around 1 PM, may benefit vitamin D status without excessive UV exposure. Balancing dietary vitamin D supplements with sun avoidance offers an alternative.
Lifestyle adjustments that increase vitamin D intake can amplify photoprotective benefits while using standard sun protection.
Personalized supplementation schedules should be formulated in collaboration with healthcare practitioners, recognizing that these approaches may not suit everyone (Bowser, 2020; Claveau & Lynde, 2020; McDonald et al., 2023).

Laser therapy and sun protection

Treatments such as laser therapy significantly reduce sun exposure, especially ablative or resurfacing treatments like CO_2 laser, which can increase sun sensitivity and risk of post-inflammatory hyperpigmentation.
Therefore, proper precautions to protect the skin from harmful UV rays are crucial (Amato et al., 2023; Amato et al., 2024a; Nisticò et al., 2024).
Procedures like vascular lasers, including Nd:YAG and Alexandrite used for hair removal, can be affected by sun exposure, leading to burns and laser-induced pigmentation. Patients undergoing these treatments should be aware of potential risks and take necessary measures to safeguard their skin (Zappia et al., 2022; Marigliano et al., 2022).
To ensure optimal outcomes, patients are advised to diligently apply high-SPF sunscreen and supplement their vitamin D intake.
Educating patients about potential adverse effects and emphasizing the importance of sun protection before and after procedures empower them to participate actively in their care.
Setting realistic expectations is crucial for patient satisfaction. While laser therapy can yield impressive results, patients must understand the importance of strict sun protection following recovery.
This includes avoiding prolonged sun exposure, especially during peak UV hours, and wearing protective clothing such as wide-brimmed hats and long-sleeved shirts.
Seeking shade and using UV-protective sunglasses enhance sun protection, ensuring long-lasting results and preventing complications.
Holiday phototherapy should be discouraged following laser therapy.
Due to the potential impact of sun exposure on treated skin, postponing sun-intensive activities, like vacations in sunny destinations, until after complete recovery is advisable.
By adhering to these guidelines and practicing diligent sun protection, individuals can optimize laser therapy efficacy while minimizing risks linked to sun damage (Guida et al., 2023).

Conclusion and future directions

This review highlights the complex relationship between sunscreen use and vitamin D synthesis. While sunscreen can inhibit vitamin D production, optimal synthesis can still occur with regular sunscreen use, although it may not replace the protective benefits of sunscreen during moderate to high sun exposures.
Public health messaging should emphasize that healthy bone mineral density and vitamin D status can be achieved by balancing outdoor activities with dietary, supplemental, and sunscreen-derived vitamin D.
Special attention is needed for children and people with darker skin types, who may require careful monitoring and balancing of outdoor activity and sunscreen use, as their vitamin D levels and bone mineral density may normalize more slowly.
Efforts to prevent skin cancer must be balanced with nutritional considerations, particularly among individuals at higher risk of vitamin D deficiency or skin diseases.
Excessive sun exposure can induce skin cancer, especially in those who sunburn easily, while excessive sunscreen use may impact vitamin D synthesis.
Future developments in sun care technology could minimize UV exposure while optimizing vitamin D synthesis, such as sunscreens and clothing that transmit enough UVB to synthesize vitamin D while blocking harmful UV rays.
The safety and efficacy of new technologies require demonstration in clinical trials.
Future research should focus on developing individualized public health messages to help people meet their personal vitamin D needs based on age, gender, genetics, lifestyle factors, and skin color.

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Effective treatment of idiopathic pyoderma gangrenosum with infliximab: presentation of a clinical case

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ABSTRACT

Background: *Pyoderma gangrenosum (PG) is a rare neutrophilic dermatosis characterized by painful ulcerations and is often associated with systemic diseases. Management of idiopathic PG remains challenging due to its unpredictable response to conventional therapies.*

Case Presentation: *We report a 64-year-old male patient with idiopathic PG who presented with a rapidly progressing ulcerative lesion on the right gluteal region. Previous treatments with topical agents and systemic corticosteroids were ineffective.*

Intervention: *The patient was treated with intravenous infliximab at a dose of 5 mg/kg at weeks 0 and 2, followed by subcutaneous injections of infliximab 120 mg every four weeks.*

Results: *Significant clinical improvement was observed within two weeks of the first infusion, with a reduction in ulcer size and depth. By week 12, near-complete healing was achieved without adverse effects.*

Conclusion: *Infliximab demonstrated rapid and significant efficacy in treating idiopathic PG, suggesting it as a viable therapeutic option even in the absence of underlying systemic conditions.*

KEYWORDS

Pyoderma gangrenosum, ulcerative lesion, systemic diseases

INTRODUCTION

Pyoderma gangrenosum (PG) is a rare, ulcerative cutaneous disorder classified among neutrophilic dermatoses due to the prominent infiltration of neutrophils in affected tissues. First described by Brunsting et al. in 1930, PG is characterized by painful skin ulcers that can rapidly progress and lead to significant morbidity [1]. The annual incidence of PG is estimated to be between 3 and 10 cases per million population, affecting individuals predominantly in the fourth and fifth decades of life, with a slight female predilection.

The pathogenesis of PG remains incompletely understood but is believed to involve immune system dysregulation, leading to abnormal neutrophil chemotaxis and activation. Elevated levels of pro-inflammatory cytokines, such as tumor necrosis factor-alpha (TNF-α), interleukin (IL)-1β, IL-17, and IL-23, have been implicated in the disease process [2]. Approximately 50–70% of PG cases are associated with underlying systemic conditions, most notably inflammatory bowel diseases (ulcerative colitis and Crohn's disease), rheumatologic disorders (e.g., rheumatoid arthritis), and hematological malignancies (e.g., leukemia, monoclonal gammopathies) [3]. However, a subset of patients presents with idiopathic PG, where no associated systemic disease is identified.

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Clinically, PG typically presents as a rapidly enlarging, painful ulcer with undermined violaceous borders and a purulent base. The lower extremities are the most common sites of involvement, although lesions can occur on any part of the body.

The diagnosis is primarily clinical, supported by histopathological findings of neutrophilic infiltration, and is made after excluding other causes of ulceration such as infection, vasculitis, and malignancy.

Management of PG is challenging and requires a multidisciplinary approach. Conventional therapies include systemic corticosteroids and immune-suppressive agents like cyclosporine, azathioprine, and mycophenolate mofetil [4].

These treatments, however, are often associated with significant side effects and variable efficacy. In recent years, biologic therapies targeting specific inflammatory pathways have emerged as promising alternatives. TNF-α inhibitors (e.g., infliximab, adalimumab), IL-1 inhibitors (e.g., anakinra),

IL-17 inhibitors (e.g., secukinumab), and IL-23 inhibitors (e.g., ustekinumab) have shown efficacy in treating PG [5-6].

Infliximab, a chimeric monoclonal antibody against TNF-α, has been successfully used in PG patients, particularly those with concomitant inflammatory bowel disease [7-9]. However, data on its efficacy in idiopathic PG are limited.

Herein, we present a case of idiopathic PG effectively treated with infliximab, highlighting its potential role in managing complex cases resistant to conventional therapy.

Case Presentation

A 64-year-old male patient presented to our dermatology clinic in November 2023 with a non-healing ulcer on the right gluteal region.

The lesion originated in July 2023 as a painful nodule that rapidly ulcerated. Initial treatments with topical agents and systemic corticosteroids were unsuccessful.

On examination, the ulcer measured approximately 5 cm in diameter, exhibiting well-defined edges, undermined violaceous borders, and a purulent exudative base **(Figure 1A**).

The perilesional skin was inflamed, and the patient reported severe pain affecting his daily activities.

A punch biopsy of the lesion revealed a dense neutrophilic infiltrate with suppurative and abscess-forming characteristics, consistent with PG. Laboratory investigations, including complete blood count, inflammatory markers, fecal occult blood test, fecal calprotectin, colonoscopy, antinuclear antibodies (ANA), extractable nuclear antigen antibodies (ENA), antineutrophil cytoplasmic antibodies (ANCA), rheumatoid factor, serum and urine protein electrophoresis, and serology for HBV, HCV, HIV, and Treponema pallidum, were all within normal limits or negative.

A history of psoriasis vulgaris was noted, but the patient had no active psoriatic lesions at presentation. Given the lack of response to previous therapies and the absence of identifiable systemic disease, a decision was made to initiate infliximab therapy.

The patient received intravenous infliximab at 5 mg/kg at weeks 0 and 2. Subsequent maintenance therapy involved subcutaneous injections of infliximab 120 mg every four weeks.

Notably, there are no literature data of other cases of psoriasis and PG treated with infliximab in subcutaneous formulation.

Results

Remarkable clinical improvement was observed two weeks after the initial infusion.

The ulcer showed significant reduction in size and depth, with healthy granulation tissue evident at the base (**Figure 1B**). The patient reported substantial pain relief. At week 6, further healing was noted (**Figure 1C**), and the patient commenced subcutaneous infliximab administration

By week 12, the ulcer had nearly completely resolved, with minimal residual scarring and no signs of active inflammation **(Figure 1D**). Throughout the treatment course, the patient tolerated infliximab well, with no adverse events reported.

Figure 1A-1B-1C-1D

1A 1B

1C 1D

Discussion

This case demonstrates the efficacy of infliximab in treating idiopathic PG, emphasizing its potential as a first-line therapy in refractory cases. TNF-α plays a pivotal role in the inflammatory cascade of PG by promoting neutrophil activation and migration [2]. Infliximab, by neutralizing TNF-α, interrupts this pathway, leading to rapid clinical improvement.

While infliximab is well-documented in treating PG associated with systemic diseases, particularly inflammatory bowel disease, its use in idiopathic cases is less established [7-15]. The successful outcome in our patient suggests that infliximab can be effective even when PG occurs without an underlying systemic condition.

The transition from intravenous to subcutaneous infliximab was implemented to enhance patient convenience and adherence to therapy. Subcutaneous administration allows for self-injection, reducing hospital visits and healthcare costs.

To our knowledge, this is among the first reports utilizing subcutaneous infliximab in PG treatment, indicating its feasibility and efficacy.

The patient's history of psoriasis vulgaris raises considerations about potential shared pathogenic mechanisms between psoriasis and PG, both involving neutrophilic dermatoses and TNF-α-mediated pathways.

However, the absence of active psoriasis suggests that infliximab's effect was predominantly on PG pathology in this case.

Our findings align with emerging evidence supporting biologic therapies as effective treatment modalities for PG, offering advantages over conventional immunosuppressants in terms of targeted action and safety profile [5,6;16-29].

Conclusion

Infliximab treatment led to rapid and significant improvement in a patient with idiopathic PG unresponsive to conventional therapies. The use of subcutaneous infliximab represents a novel and effective approach, enhancing patient compliance. This case supports the consideration of infliximab as a viable therapeutic option for idiopathic PG and underscores the need for further research into biologic therapies for managing complex neutrophilic dermatoses.

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