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THE ROLE OF PUVA THERAPY IN THE TREATMENT OF PSORIASIS

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Abstract: Psoriasis is a chronic immune-mediated inflammatory skin disease characterized by keratinocyte hyperproliferation and dysregulated immune responses. Despite advances in biologic therapies, phototherapy remains an important treatment modality for moderate-to-severe psoriasis. PUVA therapy (psoralen plus ultraviolet A) is one of the most established photochemotherapy methods used in dermatological practice. It combines a photosensitizing agent (psoralen) with UVA radiation to induce anti-proliferative and immunomodulatory effects on psoriatic lesions. This article reviews the mechanisms of PUVA therapy, its clinical efficacy, indications, safety profile, and its role in modern psoriasis management.

Keywords: psoriasis, PUVA therapy, phototherapy, psoralen, UVA, dermatology, immune modulation.

Introduction. Psoriasis is a chronic relapsing inflammatory skin disorder affecting approximately 2–3% of the global population. The disease is characterized by erythematous plaques covered with silvery scales, resulting from excessive proliferation and abnormal differentiation of keratinocytes. In addition to cutaneous manifestations, psoriasis is associated with systemic inflammation and comorbidities such as psoriatic arthritis, cardiovascular disease, metabolic syndrome, and psychological disorders.

The pathogenesis of psoriasis involves genetic predisposition, environmental triggers, and immune system dysregulation, particularly activation of the IL-23/Th17 axis. Although biologic therapies have significantly improved treatment outcomes, phototherapy remains a cornerstone in dermatological practice, especially for patients who are not candidates for systemic immunosuppressive therapy.

PUVA therapy (psoralen + ultraviolet A) was introduced in the 1970s and has since been widely used for the treatment of moderate-to-severe psoriasis. Psoralen is a photosensitizing compound that intercalates into DNA, and upon exposure to UVA radiation, forms cross-links that inhibit DNA synthesis and cell proliferation. This mechanism leads to reduced keratinocyte hyperproliferation and modulation of immune responses.

The aim of this study is to analyze the role of PUVA therapy in psoriasis treatment, focusing on its mechanism of action, clinical effectiveness, indications, limitations, and safety profile.

Materials and Methods

This study was conducted as a narrative literature review. Scientific articles were retrieved from PubMed, Scopus, Web of Science, and Google Scholar databases covering the period from 2000 to 2025. The search was performed using keywords such as “psoriasis,” “PUVA therapy,” “psoralen,” “ultraviolet A,” “photochemotherapy,” and “phototherapy.”

Inclusion criteria included clinical trials, randomized controlled studies, systematic reviews, and observational studies evaluating PUVA therapy in patients with psoriasis. Studies focusing

on treatment outcomes, immunological effects, dosing protocols, and adverse effects were included.

Exclusion criteria included case reports, non-peer-reviewed articles, studies unrelated to psoriasis, and articles lacking sufficient clinical data. Data extraction included study design, sample size, PUVA protocol, treatment duration, clinical response, and adverse effects.

The collected data were analyzed qualitatively to evaluate the efficacy, safety, and clinical role of PUVA therapy in psoriasis management.

Results and Discussion

Mechanism of PUVA Therapy. PUVA therapy works through the interaction of psoralen with UVA radiation, resulting in DNA cross-linking and inhibition of keratinocyte proliferation. This leads to suppression of epidermal hyperplasia and reduction of inflammatory cell infiltration.

Additionally, PUVA therapy modulates immune responses by decreasing the activity of T-lymphocytes and reducing cytokine production, particularly IL-2, TNF-α, and IFN-γ.

Clinical Efficacy. Clinical studies demonstrate that PUVA therapy is highly effective in moderate-to-severe psoriasis. Approximately 70–90% of patients achieve significant clinical improvement after a full treatment course.

Table 1. Clinical outcomes of PUVA therapy in psoriasis

Outcome	Result
PASI improvement	70–90%
Complete remission	50–70%
Time to response	4–8 weeks
Relapse rate	Moderate

Indications and Advantages

PUVA therapy is indicated in: Moderate to severe plaque psoriasis, Palmoplantar psoriasis, Resistant psoriasis cases, Patients not responding to topical therapy.

Advantages include: High efficacy, Long remission periods, Non-invasive treatment, Cost-effectiveness compared to biologics

Limitations and Side Effects. Despite its effectiveness, PUVA therapy has limitations:

- Increased risk of skin aging
- Risk of skin cancer with long-term use
- Photosensitivity reactions
- Gastrointestinal side effects from psoralen

Common adverse effects include erythema, itching, nausea, and phototoxic burns.

Table 2. Advantages and disadvantages of PUVA therapy

Advantages	Disadvantages
High efficacy	Risk of skin cancer
Long remission	Requires multiple sessions
Cost-effective	Photosensitivity
Widely available	Not suitable for all patients

Discussion. PUVA therapy remains an important therapeutic modality in psoriasis management despite the emergence of biologic drugs. Its immunomodulatory and antiproliferative effects provide significant clinical benefit, particularly in patients with refractory disease. However, due to potential long-term risks, its use has declined in some countries in favor of narrowband UVB and biologic therapies.

Combination therapy strategies and optimized dosing protocols may improve safety and efficacy outcomes. Further studies are required to better define long-term risks and establish standardized treatment guidelines.

Conclusion. PUVA therapy is an effective and well-established treatment option for moderate-to-severe psoriasis. It provides significant clinical improvement through photochemical and immunomodulatory mechanisms. Although newer therapies have emerged, PUVA remains a valuable option in selected patients. Careful patient selection and monitoring are essential to minimize adverse effects and maximize therapeutic benefits.

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