Formulation of a Herbal Cream for the Management of Psoriasis

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Abstract

Psoriasis is a chronic inflammatory and immune-mediated skin disorder characterised by erythema, scaling, itching, and hyperproliferation of keratinocytes. Long-term use of conventional therapies such as topical corticosteroids and systemic immunosuppressants is often associated with adverse effects, creating a need for safer therapeutic alternatives. Herbal formulations have gained significant attention due to their improved safety profile and therapeutic efficacy. Calendula officinalis, Glycyrrhiza glabra (liquorice), and Ocimum sanctum (tulsi) are well-known medicinal plants possessing anti-inflammatory, antioxidant, antimicrobial, immunomodulatory, and wound-healing properties that are beneficial in the management of psoriasis. The present review highlights the pharmacological potential of these herbal drugs and their role in the formulation of a topical herbal cream for psoriasis management. Emphasis is given to formulation aspects, mechanism of action, and evaluation parameters of the herbal cream, along with its advantages over conventional topical therapies. The review concludes that a herbal cream containing calendula, liquorice, and tulsi may serve as a promising, effective, and safe approach for the topical management of psoriasis.

Key words

Psoriasis, Herbal cream, Calendula officinalis, Glycyrrhiza glabra, Ocimum sanctum, Anti-inflammatory activity, Topical formulation, Herbal medicine, Skin inflammation

Introduction

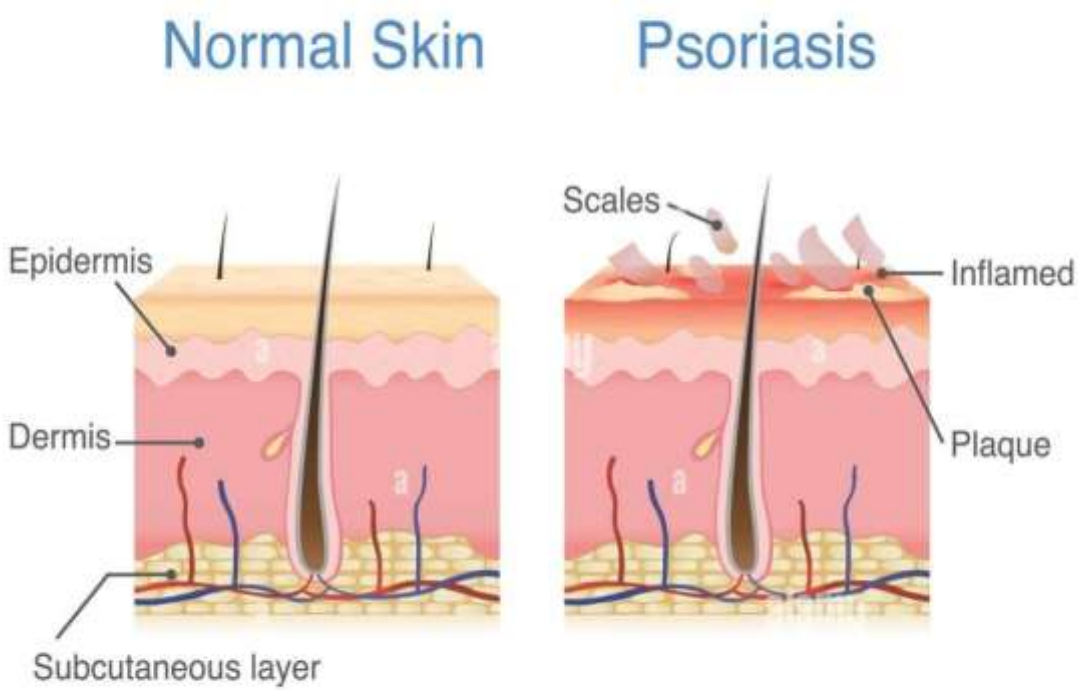
Psoriasis is a chronic, immune-mediated inflammatory skin disorder affecting approximately 2–3% of the global population. It is characterized by erythematous plaques, excessive scaling, pruritus, and abnormal keratinocyte proliferation resulting from dysregulated immune responses involving T-cells and pro-inflammatory cytokines. The disease not only causes physical discomfort but also significantly impacts the psychological and social well-being of patients, thereby reducing quality of life.

Conventional management of psoriasis includes topical corticosteroids, vitamin D analogues, retinoids, phototherapy, and systemic immunosuppressive agents. Although these therapies are effective in controlling symptoms, long-term use is often associated with adverse effects such as skin atrophy, irritation, tolerance, systemic toxicity, and high treatment costs. These limitations highlight the need for safer, cost-effective, and patient-friendly alternatives, especially for long-term management.

Herbal medicines have been used traditionally for centuries in the treatment of various skin disorders and are gaining renewed interest due to their favorable safety profile, multi-targeted action, and better patient compliance. Herbal topical formulations, particularly creams, are preferred for psoriasis as they provide localized action, enhanced skin hydration, and reduced systemic exposure. The presence of bioactive phytoconstituents such as flavonoids, triterpenoids, phenolics, and glycosides contributes to their anti-inflammatory, antioxidant, immunomodulatory, and wound-healing effects.

Calendula officinalis, Glycyrrhiza glabra (liquorice), and Ocimum sanctum (tulsi) are well-documented medicinal plants with significant therapeutic potential in inflammatory and autoimmune skin conditions. Calendula officinalis exhibits strong wound-healing and anti-inflammatory activity, promoting skin regeneration and reducing erythema. Glycyrrhiza glabra contains glycyrrhizin and flavonoids that possess corticosteroid-like anti-inflammatory effects without associated

side effects. Ocimum sanctum is known for its antioxidant, antimicrobial, and immunomodulatory properties, which help in reducing inflammation and preventing secondary infections.



Types of psoriasis

Psoriasis is a chronic inflammatory skin disease characterized by red, scaly patches. It is classified into different types based on clinical appearance and distribution**.**

1. Plaque Psoriasis (Psoriasis Vulgaris)

This is the most common type. It presents as well-defined, raised red plaques covered with silvery-white scales. Lesions commonly appear on the elbows, knees, scalp, and lower back. It is a chronic and relapsing condition.

2. Guttate Psoriasis

This type appears as small, drop-shaped red lesions on the trunk, arms, and legs. It is more common in children and young adults and is often triggered by streptococcal throat infection.

3. Inverse Psoriasis

Also called flexural psoriasis, it occurs in skin folds such as the armpits, groin, under the breasts, and buttocks. The lesions are smooth, red, and shiny without thick scaling due to moisture in these areas.

4. Pustular Psoriasis

This form is characterized by white pustules (pus-filled blisters) surrounded by red skin. It may be localized (commonly on palms and soles) or generalized and can be associated with fever and systemic symptoms.

5. Erythrodermic Psoriasis

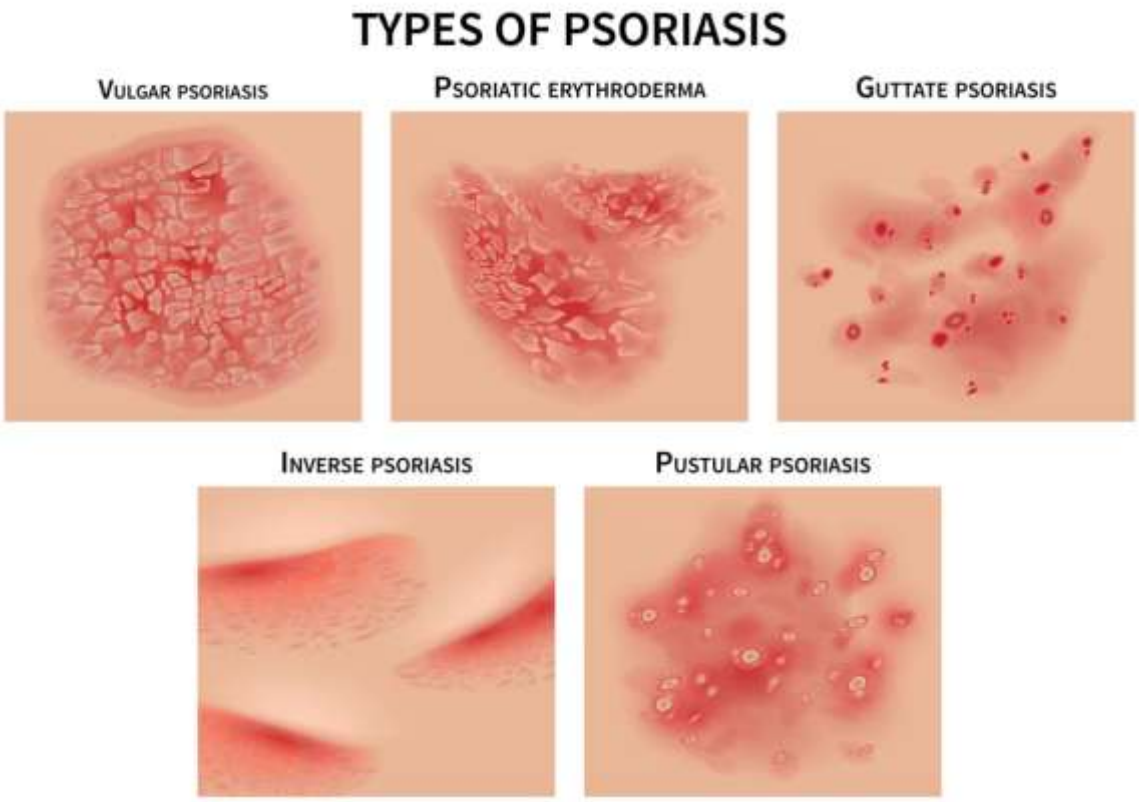
A rare and severe type in which widespread redness, scaling, and inflammation cover most of the body surface. It can be life-threatening and requires immediate medical attention.

6. Nail Psoriasis

It affects fingernails and toenails, causing pitting, discoloration, thickening, and separation of the nail from the nail bed.

7. Psoriatic Arthritis

A type of inflammatory arthritis associated with psoriasis. It causes joint pain, stiffness, and swelling and may occur along with skin lesions.



Symptoms

Psoriasis presents with a wide range of clinical manifestations that vary in severity, duration, and distribution among individuals. The hallmark symptom of psoriasis is the presence of erythematous plaques covered with silvery-white scales, resulting from excessive proliferation and abnormal differentiation of keratinocytes. These plaques are commonly observed on the scalp, elbows, knees, lower back, and extensor surfaces of the body.

Dryness and cracking of the skin are frequent symptoms due to impaired skin barrier function. In severe cases, the cracked skin may bleed, leading to discomfort and an increased risk of secondary infections. Patients often experience pruritus (itching**),** which may range from mild to severe, along with burning, stinging, or soreness in the affected areas, significantly impacting daily activities and sleep qualitySkin thickening occurs as a result of chronic inflammation and repeated cell turnover, causing plaques to become raised and well-defined. In inflammatory phases, the lesions may be tender and painful. Environmental factors such as cold weather, stress, and mechanical injury can exacerbate these symptoms.

Psoriasis also commonly affects the nails, leading to changes such as pitting, discoloration, onycholysis (separation of the nail plate from the nail bed), and thickening. Nail involvement is often associated with more severe disease and may be linked to psoriatic arthritis.

In some patients, psoriasis extends beyond the skin to involve the joints, resulting in psoriatic arthritis, characterized by joint pain, stiffness, swelling, and reduced mobility. Systemic symptoms such as fatigue, malaise, and fever may be observed in severe forms like erythrodermic or generalized pustular psoriasis. Overall, these symptoms collectively impair the physical, emotional, and social well-being of affected individuals**.**

Diagnosis

Clinical examination: Diagnosis is primarily based on physical examination of characteristic erythematous plaques with silvery scales and typical distribution on the body.

Medical history: Family history of psoriasis, age of onset, triggering factors, and previous episodes are evaluated.

Auspitz sign: Pinpoint bleeding observed after removal of scales, supportive of psoriasis.

Koebner phenomenon: Development of lesions at sites of skin injury.

Skin biopsy: Performed in atypical cases to confirm diagnosis; shows epidermal hyperplasia, parakeratosis, and inflammatory cell infiltration.

Nail examination: Assessment for nail pitting, discoloration, and onycholysis.

Joint assessment: Evaluation for joint pain and stiffness to rule out psoriatic arthritis.

Laboratory tests: Usually not specific, but may be used to exclude other conditions or assess

Pathophysiology

Psoriasis is a chronic, immune-mediated inflammatory disorder involving complex interactions between genetic predisposition, immune system dysregulation, and environmental triggers. The disease is primarily driven by abnormal activation of T-lymphocytes, particularly Th1 and Th17 cells, which play a central role in initiating and maintaining inflammation in the skin.

Upon activation, these immune cells release pro-inflammatory cytokines such as tumor necrosis factor-α (TNF-α), interleukin-17 (IL-17), interleukin-23 (IL-23), and interleukin-6 (IL-6). These cytokines stimulate excessive proliferation of keratinocytes and inhibit their normal differentiation. As a result, the epidermal turnover rate is markedly accelerated, reducing the normal maturation cycle from approximately 28 days to 3–5 days. This rapid cell turnover leads to the accumulation of immature keratinocytes on the skin surface, forming thick, scaly plaques.

Angiogenesis also plays an important role in psoriasis. Increased production of vascular endothelial growth factor (VEGF) causes dilation and proliferation of dermal blood vessels, contributing to erythema and inflammation. Additionally, oxidative stress further aggravates the inflammatory process by damaging skin cells and enhancing cytokine release.

Environmental factors such as stress, infections, trauma, and certain drugs can trigger or worsen the disease by activating immune pathways. Overall, psoriasis is characterized by persistent inflammation, keratinocyte hyperproliferation, and immune imbalance, making it a suitable target for therapies with anti-inflammatory, antioxidant, and immunomodulatory properties, including herbal formulations.

Epidemiology

Psoriasis is a common chronic inflammatory skin disorder affecting approximately 2–3% of the global population.

The prevalence varies with geographical region and ethnicity, being more common in temperate climates.

Psoriasis can occur at any age, but it commonly shows a bimodal peak, with onset in young adults (15–35 years) and later in middle-aged individuals (50–60 years).

Both males and females are equally affected, although severity may differ.

A positive family history is observed in nearly 30–40% of patients, indicating a strong genetic component.

Plaque psoriasis is the most prevalent type, accounting for about 80–90% of cases.

Psoriatic arthritis develops in approximately 10–30% of patients with psoriasis.

Prevention of psoriasis

Psoriasis cannot be completely prevented due to its strong genetic and immunological basis; however, disease onset and flare-ups can be reduced by minimizing triggering factors and adopting healthy lifestyle practices. Avoidance of known triggers such as skin injury, infections, stress, smoking, and excessive alcohol consumption plays an important role in prevention. Maintaining proper skin care, including regular moisturization and protection from harsh environmental conditions, helps preserve skin barrier function. Stress management techniques such as yoga, meditation, and adequate sleep may reduce disease exacerbation. Healthy dietary habits and weight control are also beneficial, as obesity and metabolic disorders are associated with increased disease severity.

Challenges in management of psoriasis

The management of psoriasis presents several challenges due to its chronic, relapsing nature and variable clinical presentation. Long-term use of conventional therapies is often limited by adverse effects, including skin atrophy, systemic toxicity, and immunosuppression. High treatment costs, especially for biological therapies, reduce accessibility and patient compliance. Psoriasis also significantly affects psychological health, leading to stress, anxiety, depression, and social stigma, which further complicate disease management. Additionally, poor patient adherence, lack of awareness, and limited availability of safe long-term therapies remain major challenges. These limitations emphasize the need for safe, effective, and affordable alternatives, such as herbal topical formulations, for long-term management of psoriasis.

Herbal ingredients used in the management of psoriasis

S.no	Herbal ingredient	Family	Properties	Image
1.	Calendula officinalis (Calendula / Pot Marigold)	Lamiaceae.	Wound healing Corticosteroid Moisturizing effect	
2.	Glycyrrhiza glabra (Liquorice)	Fabaceae	Skin soothing Anti-inflammatory Depigmenting	
3.	Ocimum Tenuiflorum tulsi	Asteraceae	Anti-microbial Anti-oxidant Skin soothing	

Conclusion

Psoriasis is a chronic, immune-mediated inflammatory skin disorder that significantly affects the physical, psychological, and social well-being of patients. Although current therapeutic approaches such as topical agents, phototherapy, and systemic treatments are effective in controlling symptoms, their long-term use is often associated with adverse effects, high cost, and poor patient compliance. These limitations highlight the need for safer and more sustainable treatment options.

Herbal topical formulations have emerged as promising alternatives due to their multi-targeted action, better safety profile, and improved patient acceptability. Medicinal plants such as Calendula officinalis, Glycyrrhiza glabra (liquorice), and Ocimum sanctum (tulsi) possess significant anti-inflammatory, antioxidant, immunomodulatory, and wound-healing properties that are beneficial in the management of psoriasis. The formulation of a herbal cream incorporating these plants offers localized therapeutic action with minimal systemic side effects.

Overall, this review concludes that a herbal cream containing calendula, liquorice, and tulsi represents a promising and effective approach for the management of psoriasis. Further clinical studies and standardization are required to validate its efficacy, safety, and long-term benefits, paving the way for its wider acceptance in dermatological practice.

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