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A Review on Allopathic and Herbal Remedies for Psoriasis

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Abstract

Psoriasis is regarded as an autoimmune disease in which genetic and environmental factors have a significant role. Natural remedies are more acceptable with the belief that they are safe and having fewer side effects. Herbal drugs have been used since many years not only in Asian countries but also worldwide for social well being. Herbs have been one of the important and unique sources of medicines from the dawn of human civilization. Psoriasis is a common skin condition where the skin develops areas that become thick covered with silvery scales. It is a common problem, and millions of people in the world have psoriasis. Pathophysiology of the disease includes mainly the activation and migration of T cells to the dermis triggering the release of cytokines which lead to the inflammation and the rapid production of skin cells. The possible factors and triggers causing psoriasis include emotional stress, skin injury, systemic infections, certain medications and intestinal upsets. Many medicinal plants have been reported to have a therapeutic role in psoriasis, and the aim of the current study is to highlight such plants and related studies, which could add value to the psoriasis related research work.

Keywords: Psoriasis, inflammation, medicinal plants, topical therapy, oral therapy

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Introduction

Psoriasis is a chronic, multisystem inflammatory disease with predominantly skin and joint involvement. Apart from physical aspects, psoriasis has emotional and psychological impact on patients, affecting social functioning and interpersonal relationships. It can result in stigmatization, poor self-esteem, and increased stress, affecting functioning and interpersonal relationships. Despite its considerable effect on quality of life, psoriasis is under-diagnosed and undertreated. Psoriasis was first described by Robert Willan and the disease is also called as Willan's lepra. The most common type of psoriasis was found to be plaque psoriasis, and a significant proportion of these patients possess the risk of psoriatic arthritis [1]. The concept of early and late onset psoriasis was first introduced by Henseler and Christophers in 1985. They discovered two peaks regarding age of onset; first occurring at 16.22 years and later at

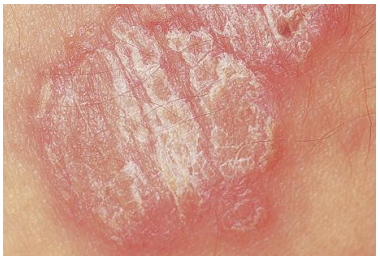
57.60 years. They further differentiated the two types of psoriasis on the basis of many features including HLA typing, heritability, and clinical course of disease. The prevalence varies from 0– 11.8% in different populations, in USA it was reported as 4.6%, in Canada 4.7%, Europe <2%, 0.7% in East Africa and China, and in India it is between 0.44-2.8%. The gender ratio was found to be 2:1 (male:female). The disease onset peaks in third to fourth decade of life [2].

Types of Psoriasis [3]

The disease may manifest in different forms with respect to clinical features and severity. Clinical type of psoriasis is an important element in determining the therapeutic regimen.

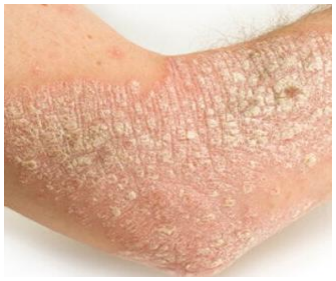
Psoriasis vulgaris

It is the most common clinical form of psoriasis, which has erythematosus plaques with sharp boundaries, localized in knees, elbows, scalp, and sacral region. It is a kind of parakeratotic hyperkeratosis. The pathology is related to decreased prostaglandin levels.



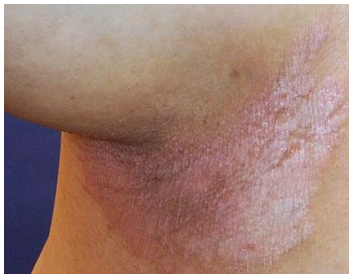
Plaque Psoriasis

It is well circumscribed, erythematosus, scaly plaques >0.5 cm in diameter, either as single lesions or as generalized disease



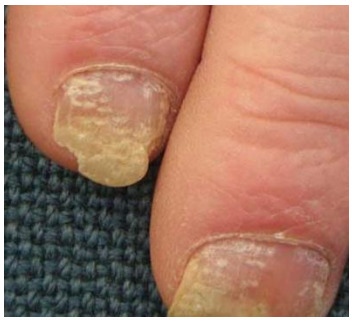
Flexural Psoriasis

It is also known as intertriginous or inverse psoriasis. It is well circumscribed, minimally scaly, thin plaques localized to the skin folds (inflammatory, axillary, groin, genital, natal cleft regions)



Nail Psoriasis

It can be present without concomitant skin plaques. It can be pitting, distal oncholysis, sublingual hyperkeratosis, oil drop sign, splinter hemorrhages, leukonychia, and crumbling,

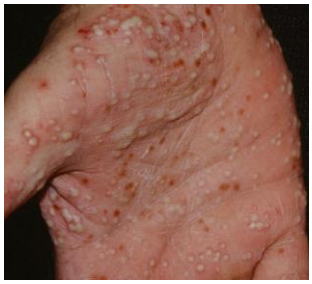


Scalp Psoriasis

It is one of the most common sites of psoriasis and is difficult to treat

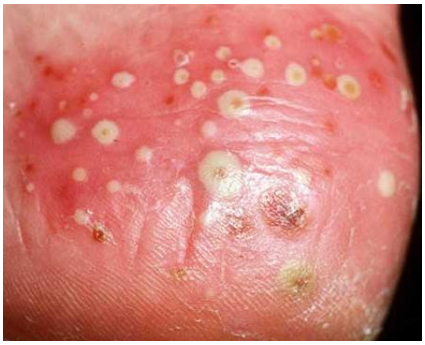
Palmoplantar Psoriasis

It is localized to the hands and soles of the feet. It has redness and scaling without obvious plaques to poorly defined scaly or fissured areas to large plaques covering the palm or sole. Erythema is not always found, but when it exists it appears as a pinkish-yellow lesion.



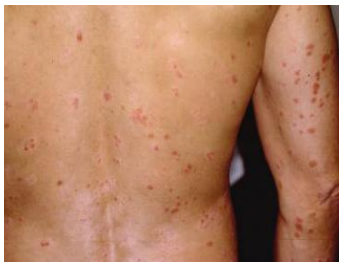
Pustular Psoriasis

It has sheets of monomorphic pustules on painful, inflamed skin and is most commonly localized to palms and soles



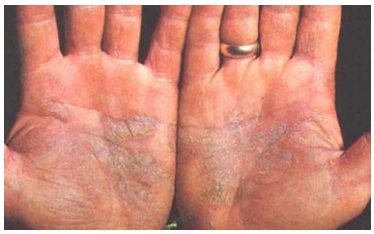
Guttae Psoriasis

It appears as acute eruption of “dew drop”, salmon-pink, fine-scaled, small plaques on the trunk or limbs. It can follow history of group A streptococcal pharyngitis or perennial group A streptococcal dermatitis. It is frequently seen in children and youngsters. The anti-streptolysin titers are usually raised. They appear in trunk, face, scalp, and limbs.



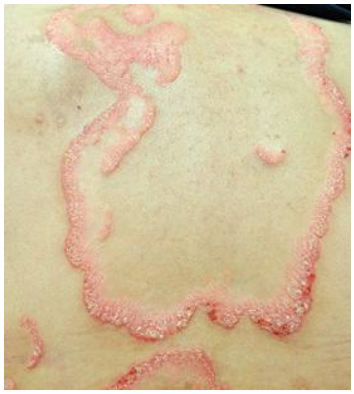
Erythrodermic Psoriasis

It is acute or subacute onset of generalized edema covering 90% or more of the patient's entire body with little scaling. It might be associated with hypothermia, hypoalbunimia, electrolyte imbalances, and high-output cardiac failure and could be a life-threatening emergency. Desquamation can lead to edema and organ failure such as cardiac, renal, or hepatic.



Annular Psoriasis

It is well demarcated erythematosus scaly plaques with central clearing



Co morbidities in Psoriasis [4]

Psoriatic arthritis is a very common systemic, inflammatory arthritis affecting psoriatic patients that can lead to significant joint damage and disability. Patients can develop remarkable morbidity and mortality if not treated early. Up to 50% of psoriasis patients develop advanced erosive disease. The presence of inflammatory arthritis in a patient with past or current psoriasis is the basis of diagnosis for psoriatic arthritis. The other comorbidities are risk of development of metabolic syndrome, cardiac disease, neoplasms, pulmonary disease, depression, osteoporosis, and inflammatory bowel disease.

Pathophysiology of Psoriasis [5]

The T helper cells producing interleukin (IL) 17, IL-22, and tumor necrosis factor (TNFα) are found to play an important role in pathogenesis of psoriasis. These inflammatory mediators lead to hyperproliferation of keratinocytes and endothelial cells. Apart from this several cytokines are implicated in pathogenesis.

Quality of life in Psoriasis [6]

Quality of life is severely compromised in psoriatic patients. There are various clinical severity scores and quality of life impairment scores employed in assessing psoriasis severity like Psoriasis area severity index (PASI), Psoriasis log based area and severity index (PLASI), Copenhagen psoriasis severity index (CoPSI), Beer-Sheva psoriasis severity index (BPSS), and National psoriasis foundation psoriasis score index (NPF-PS)

Treatment of Psoriasis

Phototherapy includes repeated exposure to ultraviolet radiations, useful in difficult to treat psoriasis like scalp psoriasis [7].

Topical therapies in Psoriasis [8]

Anthralin (dithranol)

It is the effective therapy for stable plaque psoriasis, which prevents T-cell activation, restores cell differentiation and antioxidant effect. The most common adverse effects are dose related skin irritation, staining of contact surfaces, and it should be used with caution in children.

Coal tar

It is used as daily dressing regimen, useful in chronic plaque psoriasis, palmoplantar psoriasis, and scalp psoriasis. The adverse effects include odor, contact surface staining, irritant contact dermatitis, stinging, folliculitis, and keratocanthomas. It should not be used in children and pregnancy.

Salicylic acid

It is used as topical keratolytic agent for many years, which could be combined with topical corticosteroids, and calcineurin inhibitors. The adverse effects include chronic or acute systemic intoxication with the symptoms of oral mucosa burning, frontal headache, tinnitus, nausea, and vomiting

Calcineurin inhibitors

Tacrolimus and pimecrolimus are used as ointments or creams for treating plaque-type of psoriasis. The adverse effects include stinging sensation, which is transient. Irritation is higher with tacrolimus than pimecrolimus.

Tazarotene

It is a topical cartenoid, which binds to β and γ retinoic acid on keratinocytes, and modifies the genetic transcription of keratinocytes. It reduces epidermal hyperproliferation and decreases inflammation. The common adverse effect is localized irritation.

Topical corticosteroids

Corticosteroids are antiproliferative, anti-inflammatory and immunosuppressive. They bind to cytosolic corticosteroid receptors, and alter the gene transcription of proinflammatory cytokines. Growth retardation and HPA suppression reported with the chronic use of these agents.

Vitamin D analogs

Calcipotriene

It is available as 0.005% cream, ointment, and scalp lotion

Calcitriol

It is an active metabolite and synthetic form of vitamin D, which is available as ointment only

Tacalcitol

It is available as 4mg/g ointment and lotion, and is applied once daily. The most common adverse effects include skin irritation as local effect, and systemic effects include hypercalcemia, hypercalciuria, and parathyroid hormone suppression.

Oral therapies in Psoriasis

Oral therapies are used as monotherapies or adjunctive therapies in moderate or severe refractive psoriasis after recurrence with topical, and phothotherapy. It includes methotrexate, cyclosporine, and acitretin.

Methotrexate

It is used at the dose of 7.5mg to 25mg as weekly dose, and the common adverse effects include infection, hepatotoxicity, renal failure, myelosuppression, and skin reactions

Cyclosporine

It is an IL-2 calcineurin inhibitor used as short-term therapy for severe psoriasis flares, such as pustular, and erythrodermic psoriasis. The adverse effects include hypertension, hyperlipidemia, hypomagnesimia, nephrotoxicity, neurotoxicity and infections.

Acitretin

It is a retinoid used at doses 10mg/day to 75mg/day is used to treat mild-to-moderate pustular, palmoplantar, and erythrodermic variant psoriasis. The adverse effects include dry eyes, pancreatitis, and hepatotoxicity

Apremilast It is a phosphodiesterase 4 inhibitor, which reduces epidermal thickness, and plaques. It reduces TNFα, IL-6, IL-8, IL-17 and IL-23. The adverse effects include nausea, diarrhea, nasopharyngitis, and headache.

Tofacitinib

It is a Janus Kinase pathway inhibitor which suppresses IL-15, decrease K16 expression, epidermal thickness, and lymphocytes in plaques of psoriasis. The adverse effects include nasopharhngitis, headache, and upper respiratory infections

Some of the JAK-STAT inhibitors under investigation are ASP015K, baricitinib, CF101, and FP187.

Monoclonal antibodies

Many monoclonal antibodies are useful in psoriasis, such as adalimumab, etanercept, infliximab, ustekinumab, itolizumab, and ixekizumab

Herbal therapies for Psoriasis

Wrightia tinctoria [9,10]

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contact hypersensitivity, hydro-alcoholic extract at 200mg/kg was given for 14 days. At the end of the study the tails were examined for degree of orthokeratosis. The extract at this dose was reported to have anti-psoriatic potential

The In silico strategies of 67 compounds of *Wrightia tinctoria* with 238 protein targets were performed and found to suppress the hyperkeratosis by apoptosis mechanism.

Coleus forskholii [11]

The roots of *Coleus forskohlii* had been reported to possess anti-psoriatic activity, but were not studied in animal models. Forskolin the active constituent increases cyclic adenosine monophosphate and exerts its therapeutic potential.

Silybum marianum [12, 13]

In *in vitro* radical scavenging activities of some herbs, *Silybum marianum* was used as a reference standard for testing anti-psoriatic activity.

Topical gel formulation of Silymarin was formulated with carbopol and containing paraben and propyl paraben as preservatives. The formulation was tested for skin irritancy and passed it; the anti-psoriatic activity was not conducted in animal models.

Rubia cordifolia [14]

The active component of the herb *Rubia cordifolia*, 1,4-dihydroxy-2-naphthoic acid (DHNA) was reported that it induces HaCaT keratinocytes apoptosis through caspase-dependent and caspase-independent pathways.

Mahonia aquefolium [15]

The bark extract and the alkaloids berbamine were found to be inhibitor of keratinocyte with a IC50 of 35µM

pinia galanga [16]

The ethanolic extracts of *Alpinia galang*a induced expression of TNFAIP3 and significantly reduced the expression of IL-8, and NF-KB.

Curcuma longa [17]

Microgel of hydroalcoholic extract of turmeric containing curcumioids was tested in 34 patients, for 9 weeks. It was found that it reduced the PASI, pruritis, burning and pain, reduced mean redness and leg lesions

Nigella sativa [18]

Azadirachta indica

The ethanolic extract 0.5ml, was administered topically in mouse tail model, for 14 days. The degree of ortho keratosis was reduced by *Nigella sativa* seed extract.

Melaleuca alternifolia [19]

It is called tea tree oil and terinen-4-ol was suggested to be a potent anti-psoriatic agent.

Givotia rottleriformis [20]

The ethanolic extract of *Givotia rottleriformis* was tested at two dose levels 200mg/kg and 400mg/kg b.w, 5 times a week for 2weeks, 12h after UV-B induced photodermatitis model in rats. The Munro's micro abcesses, and epidermal thickness were reduced in the 400mg/kg group.

Woodfordia fruticosa [21]

The ethanolic extracts at two concentrations 0.05% and 0.1% (w/w) ointments were applied once daily for 3 weeks, after induction of psoriasis by Complete Freund's Adjuvant model. The extracts were found to reduce the redness, erythema, and scales in a dose dependent manner.

Ricinus communis [22]

The herbal gel of *Ricinus communis* was designed and developed for psoriasis, but was not tested in any animal model.

Conclusion

The present review suggests that there are different modalities of therapy for psoriasis. Treatment with topical medications is superior to oral therapies. Even though many new allopathic drugs have emerged, the risk of adverse effects and economical constraints limit their use. The herbal drugs are numerous and safe, but standardization and testing in animal models reveal that further intensive research is needed. Very few models have been reported for psoriasis and formulation of newer herbal drugs and their testing could add value to the researchers working in this context.

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