WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 5, 2149-2162. Review Article ISSN 2277– 7105

TO EVALUATE THE ROLE OF HERBAL DRUGS IN THE MANAGEMENT OF PSORIASIS: A REVIEW ARTICLE

Loveya Siddiqui*, Yogita Tyagi and N. G. Raghavendra Rao

Department of Pharmacy GRD (PG) IMT, Rajpur road, Dehradun, 248001, Uttarakhand, India.

Article Received on
21 March 2020,

Revised on 09 April 2020,
Accepted on 29 April 2020

DOI: 10.20959/wjpr20205-17461

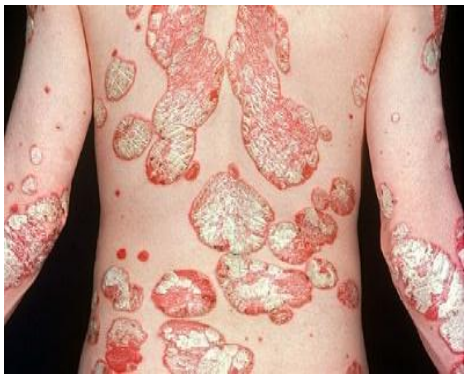
***Corresponding Author**
Miss. Loveya Siddiqui
Department of Pharmacy GRD (PG) IMT, Rajpur road, Dehradun, 248001, Uttarakhand, India.

ABSTRACT

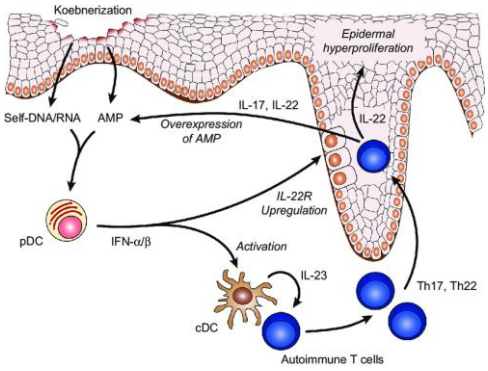
Psoriasis is a chronic, painful, noncommunicable, disabling and disfiguring disease for which there is no cure and with excessive negative impact on patient quality of life. It can occur at any age and is most ordinary in the age group 50–69. The etiology of psoriasis remains unclear, although there is evidence for genetic predisposition. Psoriasis causes great physical, emotional and social burden. QoL (quality of life), in general, is often significantly impaired. Disability, Disfiguration and marked loss of productivity are common challenges for people with psoriasis. There is also a substantial cost to mental well-being, such as higher rates of depression, leading to negative impact for individuals and society. Treatment of psoriasis is still based on controlling the symptoms. Topical and systemic therapies as well as phototherapy are available, no particular medication claims a satisfactory and complete remedy. A wide range of synthetic therapeutic agents have also been reported to cause psoriasis as their adverse effect. By virtue, herbal drugs are safe in nature and easy availability may lend themselves as potential anti-psoriatic moieties. The paper aims to explore the different plant resources known to have anti-psoriatic potential. A more scientific investigation on these herbal resources must be performed to develop a potent, safe and reliable therapy.

KEYWORDS: aloe vera, curcuma longa, givotia rottleriformis, *nigella sativa*, psoriasis, *woodfordia fruticosa.*

GRAPHICAL ABSTRACT



Psoriasis



Pathogenesis of Psoriasis

Herbal drugs for the management of Psoriasis

Curcuma longa Aloe vera Nigella Sativa Givotia rottleriformis Woodfordia fruticosa





INTRODUCTION

Psoriasis is a chronic inflammatory immune-mediated proliferative skin disorder that predominantly involves the skin, nails, and joints. Robert Willan, the father of modern dermatology, is credited with the first detailed clinical description of psoriasis, and hence, it is also termedas *Willan'slepra*.[1]

The name psoriasis is from the Greek language, meaning "roughly itching condition"(psora: "itch", sis: "action"). Psoriasis is an immune mediated disorder, where a normal skin cell mistakes for a pathogen, and sends a faulty signal that causes over production of new skin cell. It is also a hereditary condition but the way it inherits is still not predictable. It is a typically lifelong condition, which is not having a permanent cure, but various treatments can be implemented for controlling the severity of symptoms produced by it.[2]

Epidemiology

The worldwide prevalence of psoriasis is estimated to be approximately 2–3%.[3] In a diverse country such as India, the prevalence of psoriasis may vary from region to region due to variable environmental and genetic factors. We found only six studies, mostly in a hospital setting, from North India estimating the prevalence of disease among adult dermatologic patients.[4] A higher prevalence in males has been reported with a peak age at onset is in the

third and fourth decade of life.[5,6] In one of the larger studies from Northern India, point prevalence of pediatric psoriasis was estimated to be 0.0002%.[7] The peak age at onset among boys is in the 6–10 years age group compared to girls in 11–15 years age group.[8] A positive family history may be elicited in 9.8-28% of the children. The age at onset of psoriatic arthritis varies from 35 to 50 years with no sex predilection. Nearly 70% of the patients develop psoriasis before articular involvement; in another 15%, arthritis precedes the onset of psoriasis by more than 1 year, and in the remaining 15% of the cases, the two conditions occur within 12 months of each other.[9]

Classification

Epidemiologically, psoriasis has been classified into two clinical presentations of psoriasis, type I and II, distinguished by a bimodal age at onset by Henseler and Christophers.[10] Type 1 begins on or before age 40 years; Type II begins after the age of 40 years. Type I disease accounts for more than 75% of cases. Patients with early onset, or type I psoriasis, tended to have more relatives affected and more severe disease than patients who have a later onset of disease or type II psoriasis. In addition, strong associations have been reported with human leucocyte antigen (HLA)-Cw6 in patients with early onset, compared with later onset of psoriasis. The course and progress of psoriasis is unpredictable. In one study, 39% of patients reported complete remission of disease for between one and 54 years.[11] Guinot *et al*. (2009;18:712–9) have recently classified psoriasis into six phenotypic types.

Clinical features

Psoriasis is a papulosquamous disease with variable morphology, distribution, severity, and course. Papulosquamous diseases are characterised by scaling papules (raised lesions <1 cm in diameter) and plaques (raised lesions >1 cm in diameter). Other papulosquamous diseases that may be considered in the differential diagnosis include tinea infections, pityriasis rosea, and lichen planus. The lesions of psoriasis are distinct from these other entities and are classically very well circumscribed, circular, red papules or plaques with a grey or silvery-white, dry scale. The main symptoms are irritation, red and flaky patches of skin. Patches are most often seen on the elbows, knees and middle of the body, but can appear on scalp and elsewhere in the body. The skin may be itchy, dry and covered with raised thick silvery flaky skin pink red in color. Other symptoms include genital sores, joint pain, thickening and browning of nail and severe dandruff on the scalp. The disorder is so severe that it often

needs lifelong treatment. Apart from the various predicted reasons for psoriasis to induce the drug induced psoriasis are more common and is explored next to this (Jobling *et al*., 2007).

Occasionally psoriasis may involve the oral mucosa or the tongue. When the tongue is involved, the dorsal surface may have sharply circumscribed gyrate red patches with a white-yellow border. The patches may evolve and spread, changing on a daily basis, can assume distinct annular patterns and may resemble a map, hence the term *geographic tongue*.

Clinical types of psoriasis

Psoriasis is clinically classified in 2 groups: pustular and non-pustular lesions.

1. Non-pustular psoriasis

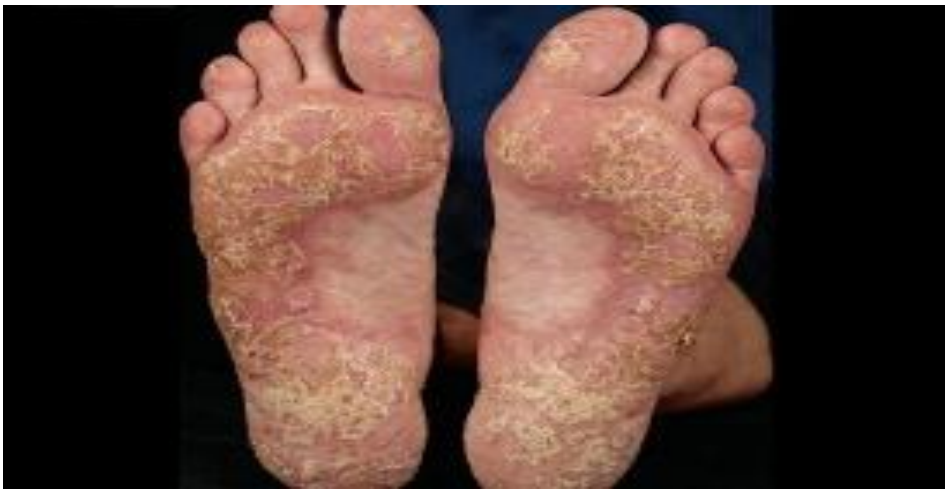
- Psoriasis vulgaris (early and late onset)
- Guttate psoriasis
- Erythrodermic psoriasis
- Palmoplantar psoriasis
- Psoriatic arthritis (PsA)
- Inverse psoriasis

2. Pustular psoriasis

- Generalized pustular psoriasis (von Zumbusch type)
- Impetigo herpetiformis
- Localized pustular psoriasis

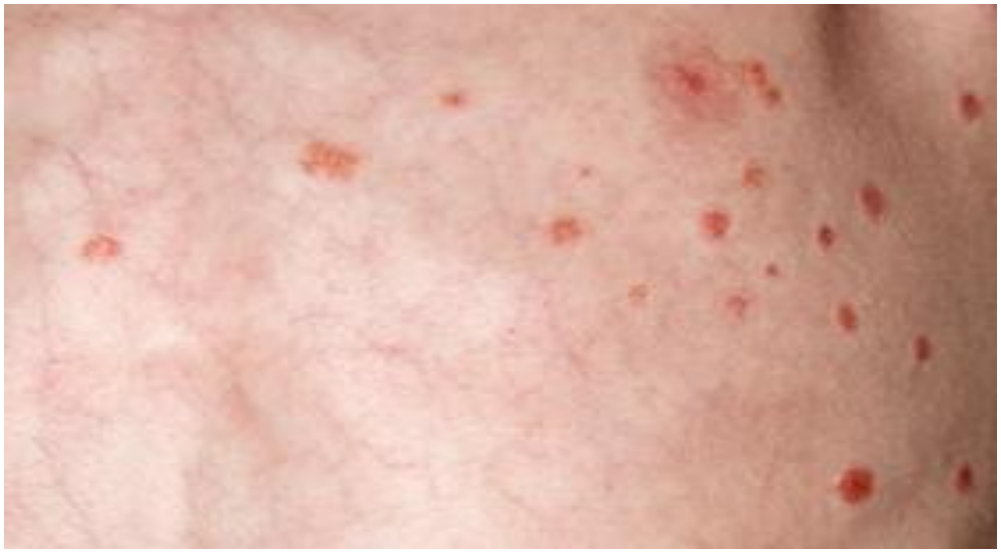
✓ Palmoplantar pustular psoriasis (Barber type)

✓ Acrodermatitis continua of Hallopeau



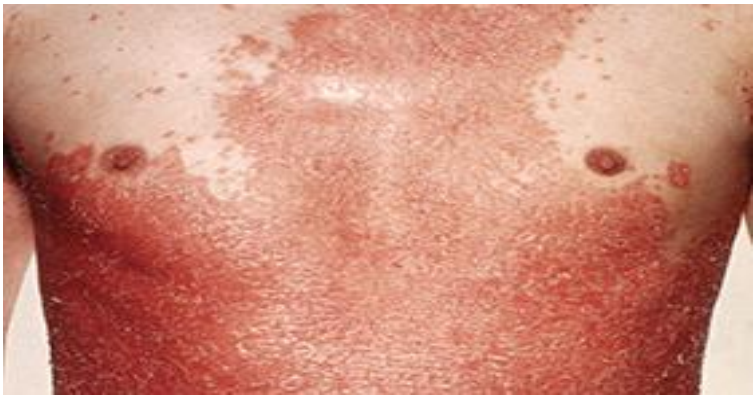
Psoriasis vulgaris

The most frequently seen clinical form of psoriasis, Psoriasis vulgaris, constitutes nearly 90% of cases. Clinically it is observed as erythematous plaques with sharp boundaries and covered with pearlescent squamae. Lesions demonstrate symmetric distribution, and they are most frequently localized on knees, elbows, scalp, and sacral region. Predilection for these lesions may be a result of traumatic incident.[12,13]



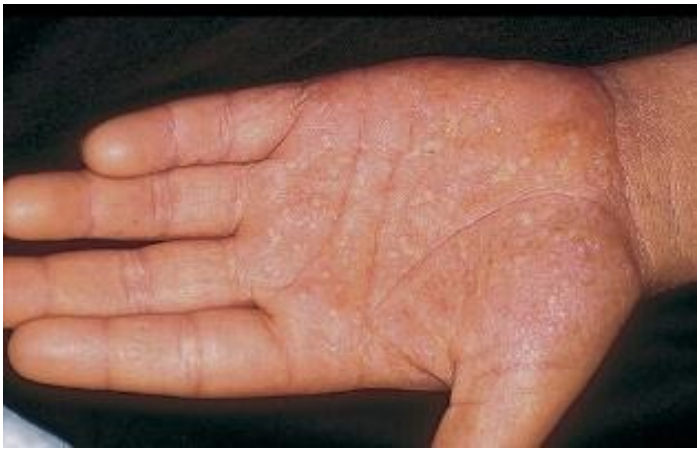
Guttate psoriasis

This type of psoriasis is frequently seen in children and young adults. Lesions onset suddenly with an appearance like small droplets, and less frequently as squamous psoriatic papules, generally manifesting after streptococcal infections. This form of psoriasis is most frequently associated with HLA-Cw6 gene. With regression of the infection, lesions generally disappear spontaneously. Lesions are generally seen on the trunk, proximal part of extremities, face, and scalp. They generally regress within 3–4 months. Sometimes lesions enlarge and take the shape of psoriatic plaque.[14]



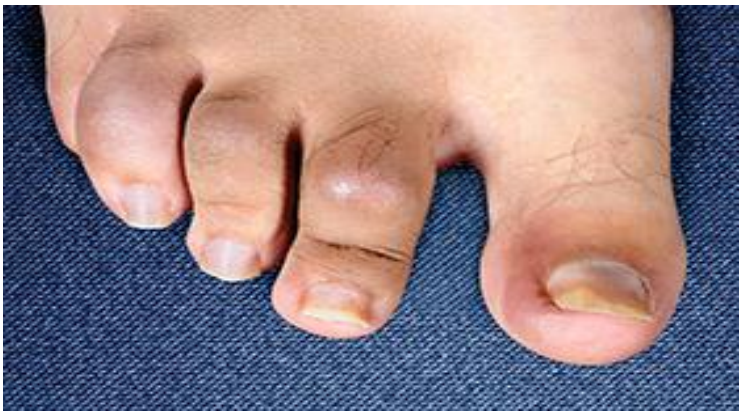
Erythrodermic psoriasis

Psoriatic lesions affect nearly 80% of the body surface in this generalized form of psoriasis. Predominantly erythematous lesions are seen, typical papules and plaques lose their characteristic features. Desquamation may also lead to protein loss and related systemic problems, such as edema of the lower extremities, and cardiac, hepatic, and renal failure, can occur. Most frequently, it develops as a complication of psoriasis vulgaris, or it can onset independently as erythrodermic psoriasis.



Palmoplantar psoriasis

Usually this type of psoriasis symmetrically involves palms of the hands and soles of the feet, and thenar regions are more frequently affected than hypothenar regions. Erythema is not always found, but when it exists it appears as a pinkish-yellow lesion.



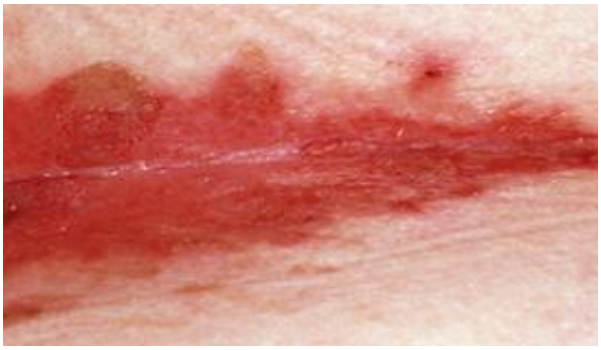
Psoriatic arthritis (PsA)

General prevalence of PsA ranges between 0.02–0. 1%, while its prevalence varies between 5.4–7% among psoriatic patients. In cases with severe skin involvement, and particularly pustular psoriasis, prevalence of PsA rises to 30–40%. In 75% of patients with PsA, psoriasis onsets before appearance of arthritic symptoms, while in 15% of cases, skin lesions are seen

concurrently with arthritis. In 10% of patients, arthritis manifests before emergence of skin lesions.[15]

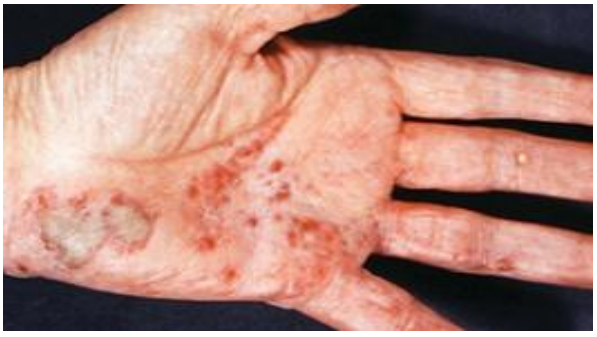
PsA can be seen in different clinical forms. Most often used are the classification criteria developed by Moll and Wright describing 5 subgroups:

CRITERIA	AFFECTS	INCIDENCE	INVOLVEMENT
Classical PsA	distal interphalangeal joints of the hands and feet	10%	Nail involvement
Asymmetric oligoarticular arthritis	knee joints, distal and proximal interphalangeal, metacarpophalangeal, and metatarsophalangeal joints	11%	joint involvement
Symmetric poliarticular form	distal interphalangeal joints bone ankylosis,	15–61%.	-
Arthritis mutilans	hands, feet	-	progressive osteolysis of phalangeal and metacarpal bones
Spondylitic form	peripheral arthritis	2–4%	-



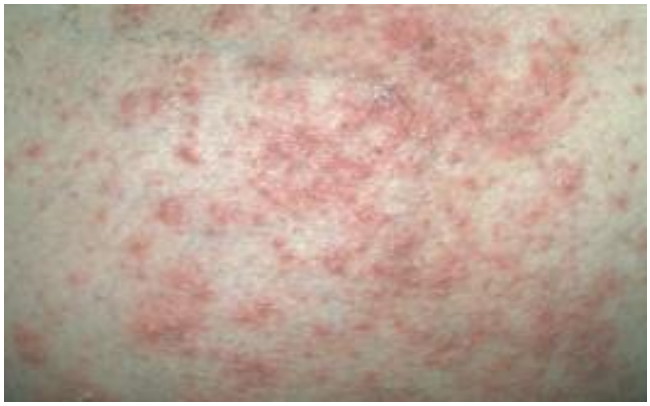
Inverse psoriasis

Psoriasis that is localized in skinfolds is termed flexural or inverse psoriasis. Squamous lesions do not form due to friction and moisture in skin folds. Lesions manifest as bright red, symmetric, infiltrative, fissured plaques with distinct contours.[16]



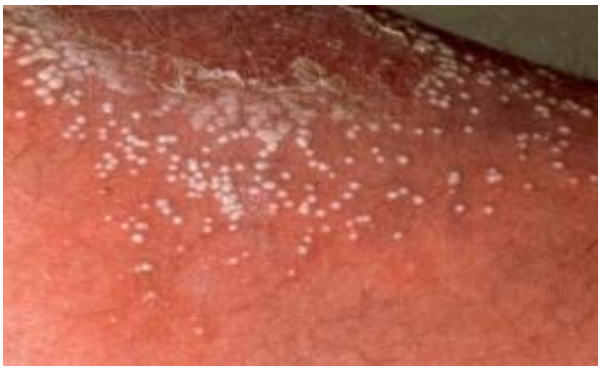
Generalized pustular psoriasis

This is a rarely seen form of psoriasis that progresses with pustules. It is most frequently seen in young individuals. It can develop independently or as a complication of psoriasis vulgaris, such as secondary to abrupt withdrawal of systemic steroid treatment, intervening triggering factors, hypocalcemia, or irritant treatment. It onsets suddenly on an erythematous background in association with general symptoms, such as high fever, lassitude, and polyarthralgia.[16]



Impetigo herpetiformis

This is a rarely seen type of psoriasis, also known as generalized pustular psoriasis of pregnancy. It is characterized by erythematous lesions covered with pustules, which start and radiate from flexural regions and have tendency to agglomerate. It may gain vegetative character at skin folds.[16]



Localized pustular psoriasis

Palmoplantar pustulosis is divided into 2 forms: Barber's pustular psoriasis and acrodermatitis continua of Hallopeau.[16]

- Pustular psoriasis of the Barber type: It is a chronic, recurrent form more frequently seen in women. Clinically, it is observed as 2–4 mm-sized pustules localized on palmoplantar region, and especially erythematous thenar and hypothenar regions.[17]
- Acrodermatitis continua (Hallopeau disease): It is a proximally progressive skin disorder characterized by sterile pustular eruptions involving fingers and toes, and leading to loss of nails and distal phalanges in severe cases. Pustules become joined, resulting in small, polycyclic, purulent, fluid-filled vesicles. Presence of a variant of psoriasis is still debatable.[17]

Management

Although there is no cure for psoriasis, there are multiple effective treatment options.

Topical therapy

- Corticosteroid
- Calcipatriol
- Calcipatriol- steroid combination

UV Therapy available

First line therapy

- UVB Phototherapy alone
- UVB Phototherapy plus acitretin
- PUVA
- UVB Phototherapy plus methotrexate

UV Therapy not available

First line therapy

✓ Non biologic

- Acitretin
- Apremilast
- Cyclosporin
- Methotrexate

✓ Biologic

- Adalimumab
- Etenercept

- Infliximab
- Secukinumab
- Ustekinumab

Second line therapy

- Acitretin plus a biologic
- Methotrexate plus a biologic
- UVB plus a biologic

Herbal drugs for psoriasis

In ancient cultures of some countries like India, China, Egypt, Greek, Rome and Syria people methodologically and scientifically collected information on herbs which lead to introduction of Herbal Pharmacopoeias. The classical examples are *Charaka Samhita* and *Sushruta Samhita* in India. Despite the importance of plant-lead discoveries in the evolution of medicine, some regulatory bodies such as U.S. Food and Drug Administration (FDA) consider herbal remedies to be insignificant or potentially dangerous. Indeed today in United States, herbal products can be marketed only as food supplements under Dietary Supplement Health and Education Act of 1994 (DSHEA).[18]

1. **Curcuma longa**- Curcuma longa commonly known as Turmeric, It is a rhizomatous herb. The plant grows to a height of 3-5 ft. It has oblong, pointed leaves and bears funnel shaped yellow flowers, peeping out of large bracts. The rhizome is the portion of the plant used medicinally. It is also reported decreased PhK activity in the curcumin and calcipotriol treated groups corresponded to severity of parakeratosis, decreases in keratinocyte transferring receptor expression and density of epidermal CD8+T cells. (Joe *et al*., 1997).

Another study (Golnaz Sarafian et al. 2015) to target this well-known herbal agent (Curcuma longa) with fantastic safety profile to be formulated as a novel topical microemulgel. The clinical and therapeutic benefit of this novel topical formulation was evaluated on 34 patients with mild to moderate plaque psoriasis in a randomized, prospective intra-individual, right–left comparative, placebo-controlled, double-blind clinical trial. The Dermatology Life Quality Index (DLQI) Questionnaire and Psoriasis area & severity index (PASI) score as well as photos before and after treatment was used to evaluate the outcomes. The results show that the clinical and quality of life parameters in treated lesions in comparison with untreated

lesions have improved (P<0.05). The reported side effects were also recorded and were trivial. Based on our findings, the proposed microemulgel may well be considered as an alternative in some patients and most likely as an add-on therapeutic option for many patients suffering with plaque psoriasis.[19]

2. **Aloe vera –** (Tanweer A Syed et al. 1996 his study showed Sixty patients (36M/24F) aged 18–50 years (mean 25.6) with slight to moderate chronic plaque-type psoriasis and PASI (Psoriasis Area and Severity Index) scores between 4.8 and 16.7 (mean 9.3) were enrolled and randomized to two parallel groups. Patients were provided with a precoded 100 g tube, placebo or active (with 0.5%*Aloe vera* extract), and they self-administered trial medication topically (without occlusion) at home 3 times daily for 5 consecutive days per week (maximum 4 weeks active treatment). By the end of the study, the *Aloe vera* extract cream had cured 25/30 patients (83.3%) compared to the placebo cure rate of 2/30 (6.6%) (*P*<0.001) resulting in significant clearing of the psoriatic plaques (328/396 (82.8%) *vs* placebo 28/366 (7.7%), *P*<0.001) and a decreased PASI score to a mean of 2.2. The findings of this study suggest that topically applied *Aloe vera* extract 0.5% in a hydrophilic cream is more effective than placebo, and has not shown toxic or any other objective side-effects.[20]

3. **Nigella sativa** - (Lalitha Priyanka et al.2012 her study showed screening of antipsoriatic activity of 95% of ethanolic extract of *Nigella sativa* seeds by using mouse tail model for psoriasis and *in vitro* antipsoriatic activity was carried out by SRB Assay using HaCaT human keratinocyte cell lines. The ethanolic extract of *Nigella sativa* seeds extract produced a significant epidermal differentiation, from its degree of orthokeratosis (71.36±2.64) when compared to the negative control (17.30±4.09%). This was equivalent to the effect of the standard positive control, tazarotene (0.1%) gel, which showed a (90.03±2.00%) degree of orthokeratosis. The 95% ethanolic extract of *Nigella sativa* shown IC50 239 µg/ml, with good antiproliferant activity compared to Asiaticoside as positive control which showed potent activity with IC50 value of 20.13 µg/ml.[21]

4. **Givotia rottleriformis** - Vijayalakshmi. A et al. 2014 her study shown to evaluate the antipsoriatic activity of three flavonoids isolated from the ethanol extract of the bark of Givotia rottleriformis were investigated using in-vitro and in-vivo model, namely Rutin (I), Luteolin-7-O-β-D-Glucuronide (II) and Kaempferol 3-O-[2-O-(6-O-feruloyl)-β-

Dglucopyranosyl]-β-D-galactopyranoside (III). The extract was standardized by HPLC using chemical markers. In vitro antiproliferant assay of the ethanol extract and isolated flavonoids were done on HaCaT cell lines. Mouse tail test was used for the evaluation of antipsoriatic activity of ethanol extract (100, 200 and 400 mg/kg b.w.) and bioactive flavonoids (50 mg/kg b.w.) in Swiss albino mice. In the HPLC analysis, 4 flavonoids were identified by comparison with retention time of standard marker viz., Rutin, Quercetin, Kaempferol and Luteolin. Maximum antiproliferant activity was shown by isolated flavonoids II and III (56.50±12.84µg/ml and 76.50±8.60µg/ml). In mouse tail model, a significant reduction in epidermal thickness with respect to control was observed in groups treated with isolated flavonoids II, III and significant orthokeratosis was observed in groups treated with ethanol extract (200 and 400 mg/kg) and isolated flavonoids II, III. Results of this study support the use of Givotia rottleriformis in traditional Indian medicine and show that extracts and isolated flavonoids of these plants can be used as an easily accessible source of natural antipsoriatic agent and can be useful in some skin problems.[22]

5. **Woodfordia fruticosa -** Amit Kumar Srivastava et al his aim of the study was to investigate the antipsoriatic activity of ethanolic extract of *Woodfordia fruticosa* flowers (EEWF) using a novel *in vivo* screening model. For induction of psoriasis, 0.1 ml of prepared complete Freund's adjuvant (CFA) and formaldehyde mixture (1:10 ratio) was topically applied for 7 days on the dorsum surface of the skin of Swiss albino mice. Psoriasis severity index (PSI) was evaluated by phenotypic (redness, erythema, and scales) and histological features (epidermal thickness). Therapeutic effect of 0.05% and 0.1% (w/w) ointments of EEWF was evaluated after the induction of psoriasis. Observation was a progressive reduction ($P < 0.05$) in the severity of psoriatic lesions (redness, erythema, and scales) from day 7 to 21st day and decreased epidermal thickness in animals treated with 0.05% and 0.1% (w/w) ointments of EEWF.[23]

CONCLUSION

Psoriasis is an autoimmune and recurrent chronic inflammatory skin disease. The characteristic features are hyperprolifration of keratinocytes leading to redness, thickening and scaling of epidermis followed with itching and appearance of the lesions which in most cases bother the patients medically and psychologically. In today scenario, there are lots of medications in different system to treat the psoriasis diseases in topical treatment, but herbal

medications have a great potency and acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. Instead of that herb-herb interaction to overcome the adverse effect, antagonist effect & the bioavailability of drug.

ACKNOWLEDGEMENT

The author expresses gratitude to GRD (PG) IMT and Director of Pharmacy (Dr.) N. G. Raghavendra Rao and Yogita Tyagi Assistant Professor for her kind support and providing facilities related to the manuscript.

REFERENCES

1. Glickman FS. Lepra, psora, psoriasis. J Am Acad Dermatol, 1986; 14: 863–6.
2. Singh and Tripathy, Natural Treatment Alternative for Psoriasis: A Review on Herbal Resources Journal of Applied Pharmaceutical Science, 2014: 4(11): 114-121.
3. Pariser DM, Bagel J, Gelfand JM, Korman NJ, Ritchlin CT, Strober BE, et al. National Psoriasis Foundation Clinical Consensus on Disease Severity. Arch Dermatol, 2007; 143: 239–24.
4. Sunil Dogra, Rahul Mahajan, Psoriasis: Epidemiology, clinical features, co-morbidities, and clinical scoring Indian Dermatol Online J., 2016; 7(6): 471–480.
5. Mehta TK, Shah RN, Marquis L. A study of 300 cases of psoriasis. Indian J Dermatol Venereol Leprol, 1976; 42: 67–74.
6. Lal S. Clinical pattern of psoriasis in Punjab. Indian J Dermatol Venereol Leprol, 1966; 35: 5–12.
7. Dogra S, Kumar B. Epidemiology of Skin Diseases in School Children: A Study from Northern India. Paed Dermatol, 2003; 20: 470–3.
8. Kumar B, Jain R, Sandhu K, Kaur I, Handa S. Epidemiology of childhood psoriasis: A study of 419 patients from northern India. Int J Dermatol, 2004; 43: 654.
9. Leonard DG, O'Duffy JD, Rogers RS. Prospective analysis of psoriatic arthritis in patients hospitalized for psoriasis. Mayo Clin Proc, 1978; 53: 511–8.
10. Hanseler T, Christopher E. Psoriasis of early and late onset: Characterization of two types of psoriasis vulgaris. J Am Acad Dermatol, 1985; 13: 450–6.
11. Farber EM, Nall LM. The natural history of psoriasis in 5600 patients. Dermatologica, 1974; 148: 1–18.

12. Gudjonsson JE, Elder JT. Psoriasis. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ, editors. Fitzpatrick's Dermatology in General Medicine. New York: McGraw Hill, 2008; 169–94.
13. Braun-Falco O, Plewig G, Wolff HH, Burgdorf WHC. Dermatology. 2nd ed. Berlin: Springer-Verlag, 2000; 585–607.
14. Van De Kerkhof PCM. Papulosquamous and Eczematous dermatoses: Psoriasis. In: Bolognıa JL, Jorizzo JL, Rapini RP, editors. Dermatology. Edinburg: Mosby, 2003; 125–49.
15. Erdem H. Psöriatikartritin klinik ozellikleri. Romatizma., 2000; 15: 31–8. [Google Scholar]
16. Gulekon A. Psöriasis ve benzeri dermatozlar. In: Tuzun Y, Gurer MA, Serveroğlu S, Sungur O, Aksungur LA, editors. Dermatoloji. 3. baskı. İstanbul: Nobel Tıp, 2008; 745–60.
17. Sarıfakıoglu E. Pustular diseases of the hand. Yeni Tıp Dergisi, 2010; 27: 138–41.
18. Ravish sahu et al. Herbal Remedies: A New Era For Psoriasis Diseases, 2011; IJPSR.0975-8232.2(3). 525-33.
19. Golnaz Sarafian et al. Topical Turmeric Microemulgel in the Management of Plaque Psoriasis; A Clinical Evaluation, Iran J Pharm Res., 2015; 14(3): 865–876.
20. Tanweer A Syed et al., Management of psoriasis with Aloe vera extract in a hydrophilic cream: a placebo-controlled, double-blind study, 1996; 1(4): 505-509.
21. Lalitha Priyanka et al, antipsoriatic activity and cytotoxicity of ethanolic extract of nigella sativa seeds pharmacogn mag, 2012; 8(32): 268–272.
22. Vijayalakshmi. A ET AL. Anti-Psoriatic Activity of Flavonoids from the Bark of Givotia rottleriformis Griff. Ex Wight, Iranian Journal of Pharmaceutical Sciences, 2014; 10(3): 81- 94.
23. Amit Kumar Srivastava Antipsoriatic activity of ethanolic extract of Woodfordia fruticosa (L.) Kurz flowers in a novel in vivo screening model Indian J Pharmacol, 2016; 48(5): 531–536.