

**AN REVIEW ON: PSORIASIS**

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**ABSTRACT**

Psoriasis is fundamentally an inflammatory skin condition with reactive abnormal epidermal differentiation and hyper proliferation affecting 2-3 % of world's population. Pathophysiology of the disease includes mainly the activation and migration of T cells to the dermis triggering the release of cytokines (tumor necrosis factor-alpha TNF-alpha, in particular) 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. Various types of psoriasis have been reported such as plaque psoriasis, psoriatic arthritis, scalp psoriasis, flexural psoriasis, guttate psoriasis, pustular psoriasis, nail

psoriasis, erythrodermic psoriasis which can be diagnosed by clinical findings such as skin biopsies etc. Therapeutic agents that either modulate the immune system or normalize the differentiation program of psoriatic keratinocytes are suggested for treating psoriasis. Based on the type of psoriasis, its location, extent and severity there are various treatment regimens available for psoriasis such as topical agents, phototherapy, systemic agents, and homeopathic approach which can help to control the symptoms. This review aims to cover each and every aspect of the disorder Psoriasis and details of particularly plaque psoriasis as about 80% of people who develop psoriasis have plaque psoriasis.

**INTRODUCTION**

Psoriasis is a chronic inflammatory dermatitis that affects about 2% of the population. It usually appears first between the age of 15 and 30 years. The lesions are characterized by brownish-red papules and plaques which are sharply demarcated and are covered with fine,

silvery white scales.<sup>[1]</sup> The term psoriasis derived from Greek word “spore” which means “itch”. It is a chronic skin disease; touching about 2% of worldwide population.<sup>[2]</sup> It is non-epidemic infection and horrible skin disorder, which can include a whole system of Person.<sup>[3]</sup> As the scales are removed by gentle scrapping, fine bleeding points appears termed Auspitz sign. Commonly involved sites are the scalp, upper back, sacral region, and extensor surfaces of the extremities, especially the knees and elbows. In about 25% of cases, peculiar pitting of nails is seen Psoriatic arthritis resembling rheumatoid arthritis is produced in about 5% of cases but rheumatoid factor is absent.<sup>[1]</sup> Genetic factor play a critical role in the pathogenesis of psoriasis. Psoriasis tends to worsen during periods of stress, during adverse environmental conditions of cold weather and low humidity, with the administration of certain drugs and during course of certain infections. Ethnic factors also play important role.<sup>[4]</sup> Psoriasis is a condition which is characterized by epidermal hyperplasia .is exaggerated and persistent. The turnover of epithelial cells is at least twice as that of normal skin. The causes of psoriasis are unknown. Some theories suggest that chalone (growth inhibitor substances) are not produced when the epidermis has attained its usual thickness.<sup>[16]</sup>

### **Types of Psoriasis**

Psoriasis can be classified into seven types as follows.

**Plaque psoriasis:** This type is widely spread, affecting 80–90% of those with psoriasis. Plaques are definite, red, elevated lesions crowned with silvery-white scales and are habitually seen over the extensor surfaces of the limbs, particularly the elbows and knees, over the scalp and at the hairline. Plaques can be huge or little and may itchy, while itching is not an important aspect of plaque psoriasis. Nail concern can occur, manifesting as pitting and departure from the nail bed (onycholysis).<sup>[2]</sup>

### **Guttate Psoriasis**

Guttate psoriasis, the word derived from the Greek word *gutta* meaning a droplet, defines the sensitive inception of a countless of tiny, 2–10 mm diameter lesions of psoriasis. These are generally distributed in a centripetal approach while guttate lesions can also involve head and limbs [Figure 1D]. Naturally, guttate psoriasis occur an acute hemolytic streptococcal illness of the pharynx or tonsils. This is most in children and rarely in adults. The number of lesions is up to 100 and commonly 5 or 10 will be seen. Guttate psoriasis accounts for 2% of the whole cases of psoriasis. In children, a delicate period of guttate psoriasis is usually self limiting in adults, guttate flares may confuse chronic plaque disease. Although a trivial

number of studies have been done on long-term prediction of children with acute guttate psoriasis, one study shown that 33% of patients with acute guttate psoriasis ultimately developed chronic plaque disease.<sup>[5]</sup>

### **Inverse Psoriasis**

Also known as Flexural Psoriasis. About 18% of those who have psoriasis have this type. It characterized by bright red lesion that are smooth and shiny.<sup>[6]</sup> Less commonly the skin folds and the umbilicus may be affected in the case. Flexural psoriasis is exasperated by sweat and roughness and there is a risk of minor infection.<sup>[5]</sup>

### **Postural Psoriasis**

This can arise in localized (palmoplantar) or generalized forms. Generalized pustular psoriasis, a cruellest form of erythrodermic psoriasis with severe systemic departure in which sterile pustules and scaling expand over the trunk and limbs [Figure 1C]. It causes extensive inflammation with malaise, pyrexia and circulatory interruption. It can be toxic, as the skin loses its capacity to maintain well-organized thermoregulation and liquid balance. It can develop instinctively or sometimes as an obstacle of potent corticosteroid therapy (particularly when high-dose systemic steroids are quickly withdrawn). Management is like to that of blisters in burn patients, as the interference to the skin's functions must be minimized and controlled. Palmoplantar psoriasis is restricted to sterile pustule formation on the palms and soles without systemic indications. It is familiar in cigarette smokers, usually in middle-aged women and few of classic plaque psoriasis patients.<sup>[7]</sup>

### **Erythrodermic Psoriasis**

It is a rare form of psoriasis and affecting 1-6 % of psoriasis cases. Characterized by widespread, fiery redness of the skin shedding of scales in sheets. It affects most of the body surface.<sup>[6]</sup>

### **Nail Psoriasis**

About 50-80% of those who have psoriasis have this type. Change in nail color, little pits in nails, and lines across nails, white area on nail plate, thickening of skin under nail, loosening of nail. The causes of nail psoriasis are combination of genetic environment, and immune causes. Yellow, keratinous may accumulate under the nail plate which is called as sublingual hyperkeratosis.<sup>[6]</sup>

### **Palmoplantar Pustulosis**

Palmoplantar pustulosis presents as solitary, yellow surroundings of erythematous and scaling affecting the palms and/or soles. The pustules are gentle and weaken to form dark brown coloration with adherent scale/crust. Palmoplantar pustulosis is often linked with psoriatic nail involvement. Approximately 25% of cases are allied with common psoriasis vulgaris, but it is now assumed that palmoplantar pustulosis may not be a form of psoriasis.<sup>[9]</sup> This termination is derived from genetic studies showing no group with Human Leukocyte Antigen (HLA) Cw6 on chromosome 6p which are correlated to chronic plaque and guttate psoriasis.<sup>[8]</sup>

### **Causes**

The cause of psoriasis is not fully understood, but several factors responsible which include genetic, environmental factors and the immune system.

- **Genetic factors**

It plays a major role in the disease. Approximately 10% of the general population has genes which are predisposed to psoriasis. Family with history of psoriasis has higher chance to develop this disease.<sup>[6]</sup>

- **Environmental factor**

Certain environmental factors trigger the psoriasis gene to become active. Some of the factors are:

Infections, such streptococcal throat or skin infections

Stress

Smoking

Obesity

Heavy alcohol consumption

Folate and vitamin B12 deficiency.<sup>[10]</sup>

- **Immune system**

In a normal healthy individual, T-cells which are part of white blood cells (WBC's) protect the body against infection by identifying and destroying foreign material. But, in psoriasis, T-cells are over-activated. Over activation of T cells trigger other immune response like dilation of blood vessels in the skin around the plaques, stimulation of inflammatory chemical signal (cytokines).<sup>[11]</sup>

### **Pathophysiology**

Psoriasis is a kind of skin disorder described by the excessive growth of skin epithelial cells and it is a T lymphocyte-mediated autoimmune disease. The pathophysiology of psoriasis considers the cellular pathological changes that occur in both epidermis and dermis. There are two main process occurs in development of psoriasis. The first process in psoriasis is characterized by excessive growth and reproduction of skin cell. The second process of the disease is characterized by immune-mediated disorder in which the excessive reproduction of skin cells occurs.<sup>[2]</sup> Antigen presenting cells in skin, such as Langerhans cells, are believed to migrate from the skin to regional lymph nodes where they interact with T-cells. A number of co-stimulatory signals trigger an immune response, leading to T-cell activation and the release of cytokines. Co-stimulatory signals are initiated via the interaction of adhesion molecules on the antigen –presenting cells such as lymphocyte function –associated antigen (LFA)-3 and intercellular adhesion molecule, with their respective receptor CD2 and LFA-1 on T cells. These T cells are released into the circulation and traffic back into the skin. Reactivation of T cells in the dermis and epidermis and the local effect of cytokines such as tumor necrosis factor lead to the inflammation, cell mediated immune response, and epidermal hyper-proliferation observed in person with psoriasis.<sup>[6,12]</sup>

### **Diagnosis**

The diagnosis of psoriasis is usually based on the appearances of the skin. There are no special blood tests or diagnostic procedure for psoriasis.<sup>[6]</sup> Diagnosis is generally done by clinical examination. At hand, there is no precise tests are available to diagnose psoriasis, Sometimes biopsy may be carried out to differentiate it from fungal infection. Diagnosing the joints by pain and using X-ray and bone scanning methods.<sup>[2]</sup> Another sign of psoriasis is that when the plaque is scraped, one can see pinpoint bleeding from the skin below. Diagnosis of psoriasis is made easily by clinical examination. Usually no test is required to diagnose psoriasis, but to rule out other complication blood test and imagine studies are often performed.<sup>[14]</sup>

### **Epidemiology**

Psoriasis affects both sexes equally and can occur at any age, although it most commonly appears for the first time between the ages of 15 and 25 years. The prevalence of psoriasis in western populations is estimated to be around 2-3%.<sup>[14]</sup> On the basis of the bimodal distribution of the age at onset and inheritance, two types of psoriasis have been discussed.

Type I psoriasis (approximately 65% of the psoriasis population) is associated with onset below the age of 40, a positive family history of psoriasis, a preceding streptococcal sore throat, and guttate lesions. Type II psoriasis (35% of psoriasis patients) appears to be associated with a population with onset after the age of 40 years and with no family history of psoriasis. Type II is not linked to a preceding infectious trigger. The dominant clinical picture is chronic plaques and an association with nail and joint involvement has been described<sup>[15]</sup>

### **Treatment**

Various treatments are available for the management and control the symptoms of psoriasis. Nowadays different therapies are obtainable to cure the disease such as topical, phototherapy and systemic therapy.

### **Topical Therapy**

Topical treatment for psoriasis is many, but they have different side effects. Coal tar generally used in treatment of psoriasis having effect of skin irritation, odor, staining of clothes. Topical steroid used in treatment of psoriasis having side effect of hypo pigmentation of skin atrophy. Salicylic acid is the most commonly used keratolytic agent and is often advocated for removing psoriasis scale.<sup>[18]</sup>

### **Emollient**

Regular use of an emollient or moisturizer is important. These products produce an occlusive film that limits evaporation of water from the skin and allows the stratum corneum to rehydrate itself. Patients with psoriasis should be encouraged to take a daily bath in warm water followed by generalized application of a cream or ointment moisturizer. A second or third application of a moisturizer during the day is also beneficial. These measures alone can lead to improvement of psoriasis in many patients. Hydration of the stratum corneum can also lead to enhanced delivery of other medications, such as corticosteroids.<sup>[17]</sup>

### **Corticosteroids**

Corticosteroids have an anti-inflammatory and immunomodulating effect. Corticosteroids remain first-line treatment in the management of all grades of psoriasis, both as monotherapy or as a complement to systemic therapy. They are available in a wide range of preparations including gel, cream, ointment, foam, lotion, oil and spray, and a new and innovative vehicle. Lower-potency corticosteroids are particularly recommended to apply on the face, groin, auxiliary areas, and in infants and children, whereas mid- and higher-potency corticosteroids

are commonly used as initial therapy on all other areas in adults. Super potent corticosteroids are mainly used for stubborn, cutaneous plaques or lesions on the palms, soles, and/or scalp.<sup>[19]</sup>

### **Anthralin**

Anthralin or dithranol, slows cellular proliferation decrease inflammation, and increase cellular differentiation in psoriasis. It can be applied on in-patient basis; also out-patient short-contact therapies are now available. Adverse effects are discoloration of the hair and skin irritation 24 few studies have shown the use of anthralin when combined topical therapies or phototherapy has improved response. Dithranol (0.1-1% concentration) is applied once a day and washed off thoroughly after 10 minutes to one hour. It may produce stain clothing.<sup>[2]</sup>

### **Vitamin D Analogue**

Vitamin D analogues (calcitriol and calcipotriene) have emerged as important alternatives to topical corticosteroids for the long-term therapy of psoriasis. They bind to cytoplasm Vitamin D Receptor then translocation into the nucleus, where they bind to nuclear receptor and commence the transcription of vitamin D responsive genes. These transcription proteins then regulate cell differentiation and down regulate cell proliferation and inflammatory processes associated with this condition. Calcitriol is more potent analogue but calcipotriene is most established one. Calcipotriene has shown to affect calcium homeostasis to very lesser extent.<sup>22</sup> most trials have shown that combination treatment of vitamin D and corticosteroid was usually more effective than immunotherapy with either used alone.

### **KERATOLYTICS**

**Salicylic acid:** salicylic acid is a keratolytic agent that is used widely for treatment of psoriasis. It is likely that the beneficial effect of salicylate treatment is related to a decrease in scale and therefore salicylates should be prescribed to those patients where excessive scale is problematic. Salicylates are of greatest benefit when given in combination with topical corticosteroid therapy. There is no robust evidence regarding the efficacy or tolerability of topical salicylate preparations but anecdotal evidence suggests they are well tolerated.<sup>[21]</sup>

### **Systemic Therapy**

A number of systemic medications are used for the treatment of psoriasis. Many guidelines are published about the treatment of psoriasis with systemic therapies such as the American Academy of Dermatology and European.

### **Methotroxate**

Methotrexate is the folic acid antagonist has been used successfully in the treatment of psoriasis. Along with anti-cancer activity, the MTX is also having anti-psoriatic activity. It acts by inhibiting dihydrofolate reductase then activation of folic acid leads to inhibit the synthesis of DNA. It is usually administered low-dose regimen such as once weekly. Similar doses are used in patients with rheumatoid arthritis.<sup>[2]</sup>

### **Retinoids**

Oral retinoid such as acitretin have antiproliferative and anti-inflammatory properties. They have teratogenic properties and therefore cannot be administered in women of childbearing age. The most common side effects are mucocutaneous dryness and hyperlipidemia. Acitretin is not recommended as first choice monotherapy in plaque psoriasis; however its use in combination with topical calcipotriol or phototherapy (Re-UVB or Re-PUVA) has been proven effective.<sup>[22]</sup>

### **Steroids**

Corticosteroid is used topically for a large use of dermatological conditions.<sup>[23]</sup> Potent or very potent topical steroids have been shown to be the most effective and best tolerated treatment for scalp psoriasis in head-to-head studies. They should be considered as first-line treatment and a four-week course is recommended. Steroid-induced side-effects are rare with this duration of use. Atrophy has been reported on the scalp, but with low rates of occurrence and current evidence is insufficient to draw conclusions.<sup>[22]</sup>

### **Tacrolimus**

It is immunosuppressive drugs that are useful in the controlling of atopic dermatitis, can also use for psoriasis. It may be topical steroid application may have trouble some side effects. 0.1% concentration of tacrolimus is active against psoriasis. There were few reports on that, the topical tacrolimus produce lymphoma and skin cancer in children and adults. The mode of action is inhibiting the production of interleukin-2 and promotes the development and proliferation of T cells. It is also used in the treatment of Eczema, ulcerative colitis etc.<sup>[2]</sup>

### **Hydroxyurea**

Hydroxyurea is an antimetabolite that has been used for the treatment of psoriasis for 3 decades. It can be effective as monotherapy, but nearly 50% of patients who achieve marked improvement develop bone marrow toxicity with leucopenia or thrombocytopenia.<sup>[24]</sup>

### **Phototherapy**

It has long been recognized that daily, short, non-burning exposure to sunlight helped to clear or improve psoriasis. Niels Finsen was the first physician to investigate the therapeutic effects of sunlight scientifically and to use sunlight in clinical practice. This became known as phototherapy. Sunlight contains many different wavelengths of light. It was during the early part of the 20th century that it was recognized that for psoriasis the therapeutic property of sunlight was due to the wavelengths classified as ultraviolet (UV) light. Phototherapy involves exposure to ultraviolet radiations by means of special equipment using fluorescent light source emitting specific wavelength of radiation. Natural sunlight may be used as a source of UV, but exposure becomes imprecise. UV acts by reducing cellular proliferation and modifying the immune response. Psoriasis responds to ultraviolet rays. Regular exposure to sun or artificial UV lights can cause the symptoms to subside. Approaches include UVB i.e. exposure to ultraviolet B light and PUVA i.e. exposure to UV rays combined with the drug psoralen, which increases the light sensitivity of skin. New techniques include lasers, which can focus the beneficial effects of light especially on psoriatic lesions. UV phototherapy is the simplest and easiest treatment with the best general results for clearing psoriasis.<sup>[25]</sup>

### **Uvb Phototherapy**

Ultraviolet B is widely used as broadband therapy (290-320nm). Now-a-days narrow band UVB (310-312nm) has become more popular either as a sole agent or in combination with topical calcipotriol or tazarotene, or systemic agents like acetrein or methotrexate. Narrow band UVB therapy is a relatively safe and effective therapy for moderate to severe psoriasis. **(Bulletin)** UVB treatment initially takes place with a doctor, but UVB units are also available for use in the home. UVB works by stimulating a chemical reaction in the skin cells to stop them reproducing so quickly.<sup>[14,25]</sup>

### **Puva Therapy**

Ultraviolet a (320-400nm) is used in combination with a photosensitizing agent. A psoralen compound (usually 8-methoxy psoralen i.e., 8MOP) is taken orally followed by exposure to

UVA (PUVA therapy = Psoralen + UVA). The usual dose is 0.6mg/kg taken two hours before exposure. Exposure time is gradually increased till adequate response is obtained. Two or three treatments are given per week. Protective sunglasses should be worn during exposure and for the remainder of the day. After significant clearance of the lesions, frequency of administration is reduced and maintenance treatments continued for a variable period. Precisely how PUVA works is not known. The mechanism of action probably involves activation of psoralen by UVA light which inhibits the abnormally rapid production of the cells in psoriatic skin. There are multiple mechanisms of action associated with PUVA, including effects on the skin immune system. PUVA is associated with nausea, headache, fatigue, burning, and itching. Long-term treatment is associated with squamous-cell and melanoma skin cancers. PUVA therapy should be avoided in children, pregnancy, lactation and patients with hepatic, renal and severe cardiovascular disease. Cataract formation and diseases aggravated by ultraviolet radiation are other contraindication. Side effects include erythematic, sunburn and cutaneous pigmentation.<sup>[14]</sup>

### **Biological Therapies**

These relatively new systemic therapies provide selective, immunologically directed intervention at key steps in the pathogenesis of the disease. These steps include: Inhibiting the initial cytokine release and Langerhans cell migration; Targeting activated T cells, preventing further T-cell activation, and eliminating pathologic Tcells; blocking the interactions that lead to T-cell activation or migration into tissue; Altering the balance of T-cell types; and Inhibition of pro inflammatory cytokines, such as tumor necrosis factor. Similar to the systemic agents, these therapies are typically reserved for more severe and recalcitrant cases. Patients with active psoriatic arthritis in addition to their skin disease should also be considered.<sup>[6,14]</sup>

### **CONCLUSION**

Psoriasis is a dreadful disease affecting physical, mental and social status of the victims. A new understanding of this complex disease has catalyzed the development of targeted biological treatments. These revolutionary therapies are not without potential risk, however. A review of alternative natural therapies provides some options for increasing safety and efficacy in the management of psoriasis. This review will surely prove to be an eye-opener for patients suffering from psoriasis as well as the medical practioners, pharmacists, nurses

and other persons involved in the treatment of psoriasis and help them to understand the disease in a much better way to carry out safe and effective treatment of the disease.

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