

Psoriasis and Its Treatment: A Review

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ABSTRACT: The psoriasis is chronic skin disease that causes the symptoms like abnormal skin cell growth, red circles, patches etc. It is also known as erythematous papules with silvery scales. The two types of study are used for the pathologic changes on the cellular levels. The most of cases comes in the age observed age in between the ages of 15 and 30. In the study, the reason for psoriasis disease is due to a genetic susceptibility as well as an environmental response. The estimated annual cost \$32.5 billion for treating psoriasis in United States. There are number of available marketed treatment for psoriasis in different formulations like topical and systemic formulations. But, topical formulation was considered as best potent method as compared with systemic one due to the less adverse effects and targeted methods. Herbal, homeopathic approaches are also helps to control the growth of psoriasis with low side effects as compared with topical allopathic drugs.

Keywords: Psoriasis; Pathology; Mediators; Potent and Methotrexate.

INTRODUCTION: Psoriasis is an autoimmune chronic inflammatory skin disease. It is characterized by erythematous papules or plaques with silvery scales. Basically, this disease causes the circles or patches of abnormal skin cell generation.¹ It is observed as increased in proliferation of epidermal layer related to defaulted immune system function. The observed psoriasis skin patches are typically red in the color, lack of moisture or dry skin, itching on inflamed skin portion. The psoriasis initiated from small, localized patches to coverage of complete body. The first case of psoriasis was described in Ancient Rome by Cornelius Celsus. The British dermatologist Thomas Bateman described a link between psoriasis and arthritic symptoms in 1813.² The word *psoriasis* derived from the Greek word "psora" stands for "itch". For detailed studies, psoriasis categorized in different classes as plaque psoriasis, invasive psoriasis, psoriatic arthritis, scalp psoriasis, nail psoriasis and many more. In International Federation of Psoriasis Associations (IFPA), around 3% of the world population has some symptoms of psoriasis (125 million people). In India, more than 10 million cases per year observed. Due to the increasing number of cases, it comes under common category. Therefore, inspiration comes in scientists that we need to do more efforts on the psoriasis treatment.^{1,2}

The most commonly observed age of psoriasis is in between the ages of 15 and 30. In 21st century, the available treatment can be helpful to patient treatment, but the drawback is this condition cannot be completely cured. There is around one-third of the population with psoriasis report in history of this disease and scientists have identified the genetic causes that will associate with these condition. There is around 70% chance of identical twin to have chances of a twin developing psoriasis if the other twin has the disorder. The same possibility is around 20% for non-identical twins.^{1,2,3} These observations gives idea that the both a genetic susceptibility as well as an environmental response leads in development the psoriasis. There are around estimated annual cost \$32.5 billion for treating psoriasis in US. The main source of direct expense is pharmacy as well as the biologic therapy also. In case the presence of other conditions heart disease, hypertension, diabetes, lung disease, psychiatric disorders etc. are the factors that will leads in increasing treatment costs.⁴

Psoriatic Pathophysiology: The excessive growth of skin epidermal cells is known as the psoriasis skin disorder (T lymphocyte-mediated autoimmune disease). There are study of pathologic change on the cellular levels (both in epidermis and dermis). The two main procedures occur in development of psoria-

sis. In the first process, is characterized by uncontrolled growth as well as reproduction of the skin cells. Whereas, the second process is characterized by disorder of immune-mediated in which the excessive reproduction of skin cells occurs.^{5,6} It is diminished CD4-T-cell leads to an over-activation of CD8-T-cells, this will be responsible to development of psoriasis to a HIV patients. In the different complications of psoriasis include the psoriatic arthritis, eye conditions, heart problems, obesity and diabetes, bad body temperature regulation, etc.

In complication of alcohols, the drinking alcohol is a factor. Other complication includes the irritation from the heat and sweat. Whereas, the secondary fungal infections particularly *Candida* (thrush), by the scratching of skin as well as rubbing, difficulties with sexual functions are considered as few complications when the excessive usage of topically applied creams of steroids⁷.

Pharmacology of Psoriasis: In psoriasis, there is abnormally excessive and rapid growth of the epidermal layer and abnormal production of skin cells just like during wound repair and skin cells overabundance leads the pathological events in psoriasis. Replacement of skin cells done in every 3-5 days interval in psoriasis condition as compare with usually normal 28-30 days process. The main causes of these kinds of changes are from the premature maturation of keratinocytes induced by an inflammatory cascade in the dermis involving dendritic cells, macrophages, and T cells (three subtypes of white blood cells). These immune cells move from the dermis to the epidermis and secrete inflammatory chemical signals (cytokines) such as interleukin-36 γ , tumor necrosis factor- α , interleukin-1 β , interleukin-6 and interleukin-22. These inflammatory signals are responsible to stimulate keratinocytes to proliferate. Gene mutations of proteins involved in the skin's ability to function as a barrier have been identified as markers of susceptibility for the development of psoriasis.^{8,9}

DNA released from dying cells acts as an inflammatory stimulus in psoriasis and stimulates the receptors on certain dendritic cells, which in turn produce the cytokine interferon- α . In response to these chemical messages from dendritic cells and T cells, keratinocytes also secrete cytokines such as interleukin-1, interleukin-6 and tumor necrosis factor- α which signal downstream inflammatory cells to arrive and stimulate additional inflammation. Dendritic cells bridge the innate immune system and adaptive immune system. They are increased in psoriatic lesions and induce the proliferation of T cells and type 1 helper T

cells (Th1). Targeted immunotherapy and ultraviolet A (PUVA) therapy can reduce the number of dendritic cells.^{10,11}

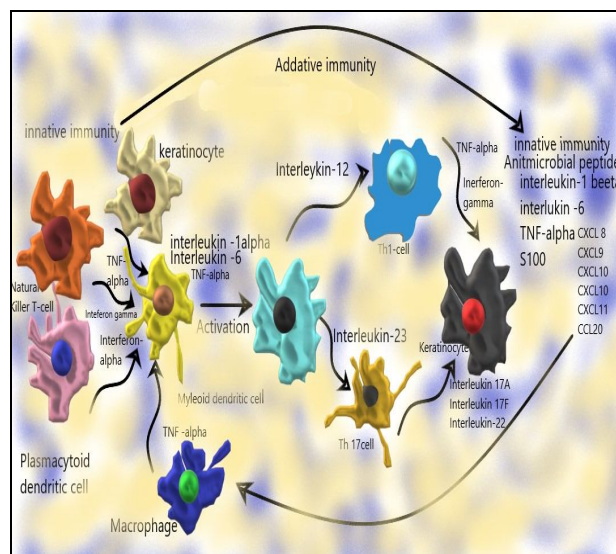


Figure 1: The mediators and key cells in transition from innate to adaptive immunity of psoriasis.

Available Marketed Formulations to the Treatment of Psoriasis:

a) Topical Agents: In case of topical agents, topical corticosteroid preparations are playing the important role when applied continuously for 8-10 weeks. The different classes of retinoids and coal tar were observed as the limited therapeutic benefits. The different kinds of Vitamin D analogues were observed to be higher effective to placebo effects.¹²

b) Systemic Agents: The systemic medications used in case of when other treatments like topical agents, phototherapy resists by diseases. The oral formulations and injections are comes under the class of systemic agents. One thing is important in case of systemic treatment is on regular basis test of liver functions and blood test also.¹² The frequently used treatment for psoriasis is non-biologic systemic treatments (methotrexate, hydroxycarbamide, fumarates such as dimethyl fumarate and retinoids) (Table 1). Whereas, in case of biologics, these are the proteins drug manufactured, they have the properties of interrupt the processes of immune that will involve in psoriasis. These kinds of medications are known to be well tolerated. Whereas their immunosuppressive actions will leads to increase in the small risk for infection.^{12,13}

c) UV Phototherapy: The sunlight has been used from a long time for treatment of psoriasis. The wavelength ranges from 311–313 nm having the high effects

therefore the lamp have been developed for this kind of therapy. The time of exposure should be specific to avoid over exposure that will leads to the skin burn. The UV lamps should be attached with a timer with help of which the overtime exposure to the UV light. The skin type is an important factor to adjust the time of exposure to UV light.¹⁴The risk factor in UV light therapies are tanning beds (no exception), specifically in the link between UV light will leads to increased chance of skin cancer as well as the increased risks of melanoma, new younger patients particularly the age of 35, having the higher in risk from melanoma from treatment of UV light.

Psoralen and ultraviolet A phototherapy (PUVA) combines the oral or topical administration of psoralen with exposure to ultraviolet (UV) light. The mode of action of PUVA is well studied, but probably having involves the activation of psoralen by UVA light that will inhibit the abnormal production of the rapid cells in the skin (psoriatic). The multiple mode of mechanisms that are associated with PUVA.¹⁵

d) Diet: The first risk factor is drinking alcohol because white blood cells (WBC) and T-cells will release to dilation of blood vessels. The different kind of cold drinks, processed foods also affects the health of skin. The omega-3-fatty acids help to control inflammation as well as boost the immune system. By drinking sufficient amount of 2-3 liters water for good moisturized skin.^{14,16}

e) Natural Remedies for the Treatment of Psoriasis: The traditional medicines give a great positive promise as an easily available source of positive therapy for different kinds of diseases of skin specifically in the tropical developing countries including India has shown in table 1.

f) Homeopathic Approaches in Psoriasis: The approaches through allopathic medication have aim on the causative factors and diseases. In the homeopathy treatment, indications of the patient give the positive results for one patient to compare to another patient. As well as in other systems, the medicines are usually selected to inhibit the process of epidermis cells proliferation. Homoeopathy medication is one of the safe, secure and gives better results by enhancing the energy to psoriasis without any kind of observed side effects.^{17,18} Some of the marketed formulations available for the treatment of psoriasis are Ars alb, Arg Nit, Baryta Mur, Corralium, Crabapple, Hudrocytole, Kali ars, Kali Brom, Lycopodium, Nat pulp, Phosphorus, Psoralea, Psorinum, Pulsatilla, Urtica urens, and many more.

Table 1: Herbal plant list with their therapeutic effects on the psoriasis.

Herbal Plant	Family	Properties
<i>Aloe barbadensis</i> (aloe vera)	Liliaceae	Palliative, antipruritic, wound healing and anti-inflammatory properties
<i>Origanum vulgare</i> (Orangeoil)	Lamiaceae	Antibacterial and anti-fungal properties
<i>Curcuma longa</i> (Turmeric)	Zingiberaceae	Reduce the puffiness, soreness and inflammation associated with arthritis
<i>Allium cepa</i> (Onion)	Liliaceae	improved disfigure smoothness, redness
<i>Allium sativum</i> (Garlic)	Liliaceae	Delayed the development of skin papilloma
<i>Berberis vulgaris</i> (Barberry)	Berberidaceae	Antioxidant, anti-inflammatory, and apparently, prevents toxin formation in the bowel
<i>Capsicum annum</i> (Capsicum)	Solanaceae	Reduce itching and pain
<i>Silybum marianum</i> (Milk thistle)	Daisy	Cheering proper liver function anti-inflammatory properties as well as decreases the unbalanced proliferation of skin cells

Table 2: List of available treatments for the psoriasis.

Types of Formulations	Available Marketed Formulations
Topical Marketed Formulations (<i>Clobetasol propionate, Tazarotene, Tacrolimus etc.</i>)	Cream, Lotion, Spray, Shampoo, Ointment
Systemic Formulations (<i>Methotrexate, Cyclosporine etc.</i>)	IM or IV
Diet	Omega-3-fatty acids, 3-4 liter water intake
UV-Phototherapy	Wavelength ranges from 311–313 nm
Homeopathic Approaches	Ars alb, Arg Nit, Baryta Mur, etc.

CONCLUSION: The psoriasis is an auto-immune disorder and its treatment is based on the treatment of symptoms and causes. The marketed formulation for the treatment of this disorder is topical corticosteroids, herbal formulations, systemic corticosteroids and other derivatives in the form of tablets, injections etc. In the genetic level study, scientists are identified that the different kinds of events causes the activation of dendritic cells that leads to the generation of T cells that are cross-talk between the epithelial cells and immune cells shapes and maintains the inflammatory milieu. The psoriasis is not a superior disease like cancer,

HIV etc. But it have very negative impact on patient lifestyle due to lack in feel comfort. Research in the few decade helps to pharmaceutical and pharmacological departments to develop and generate the highly effective marketed formulations in the treatment of psoriasis. In present days, a number of herbal plants are also in the focus of researchers due to their abundant properties that will help to control the symptoms of psoriasis. On the other hand, scientists also used the herbal plants to overcome from side effects of topical steroids. For the future, we should have to focus on the root cause of this kind of auto-immune disorder as well as instead to treat the symptoms, we should have to do work on the complete treatment of root cause of psoriasis that either be on genetic level or life style also.

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