

Advancement in Psoriasis

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Abstract: Psoriasis is a chronic disorder of the skin characterized by reddish, scaly patches of inflammation, most commonly affecting the elbows, knees, scalp. This Review highlights some understanding of psoriasis, their types, symptoms, Causes, Facts, Pathogenesis, Diagnosis & Recent drugs to treat psoriasis.

Keywords: Psoriasis, Types, Recent drugs to treat psoriasis.

WHAT IS PSORIASIS?

Psoriasis is a chronic disorder of the skin characterized by reddish, scaly patches of inflammation, most commonly affecting the elbows, knees, scalp. Psoriasis can be mild or severe. When it is severe, it can adversely affect functions of daily living including work and social activities. In Psoriasis the epidermal cells multiply about 4 times more rapidly within patches of Psoriasis as compared to the normal skin. The factors that responsible for hyper-proliferation are yet unknown. The current concept is that this defect could be due to an exaggerated immunological response and inflammation against some common organisms like bacteria and viruses. Psoriasis is neither hereditary nor contagious. Plaque psoriasis characterized by Patches of circular to oval-shaped red plaques that itch or burn. The patches are usually found on the arms, legs, trunk, or scalp but may be found on any part of the skin. The most typical areas are the knees and elbows.

SYMPTOMS:

- Irritated, red, flaky patches of skin
 - Most often seen on the elbows, knees, and middle of the body
 - Red patches may appear anywhere on the body, including the scalp
 - The skin may be:
 - Itchy
 - Dry and covered with silver, flaky skin (scales)
 - Pink-red in colour (like the colour of salmon)
 - Raised and thick
- Other symptoms may include:
- Joint pain

- Nail changes, including thick nails, yellow-brown nails, dents in the nail, and nail lifts off from the skin underneath

CAUSES:

Some common causes of psoriasis are the following:

- Psoriasis occurs when the immune system overreacts, causing inflammation and flaking of skin.
- Abnormality in the mechanism in which the skin grows and replaces itself causes psoriasis.
- Psoriasis develops when the immune system tells the body to over-react and accelerate the growth of skin cells.
- Heredity also plays a role in the development of psoriasis
- An environmental factor such as trauma, sunlight, infection, emotional stress, climatic changes etc also causes.

Genetic Causes of Psoriasis

Researchers have found 9 gene mutations that may be involved in causing psoriasis. One of these mutations on chromosome 6, called PSORS-1, appears to be a major factor that can lead to psoriasis. Mutations on genes cause certain cells to function differently. With psoriasis, these mutations seem to largely affect T-helper cells.

Immune System Causes of Psoriasis

In a normally functioning immune system, white blood cells produce antibodies to foreign invaders such as bacteria and viruses. These white blood cells also produce chemicals that aid in healing and fighting infective agents. But with psoriasis, special white blood cells called T-cells become overactive. These T-cells "attack" the skin and set off a cascade of events that make the skin cells multiply so fast they start to stack up on the surface of the skin. Normal skin cells form, mature, and then are sloughed off every 30 days. But in plaque psoriasis the skin goes through this whole process in 3-6 days. Normally T-cells produce chemicals that help heal the skin. In psoriasis, T-cells produce an abnormally large amount of these chemicals and actually cause more inflammation in the skin and joints.

PSORIASIS FACTS:

- Psoriasis is a chronic (long lasting effect) inflammatory skin disease.
- Psoriasis has no known cause.
- Psoriasis is not contagious.
- Periodic remissions (clear skin).
- Psoriasis is controllable with medication.
- Psoriasis is currently not curable.
- There are many promising therapies, including newer biologic drugs.
- Future research for psoriasis is promising.

EPIDEMIOLOGY

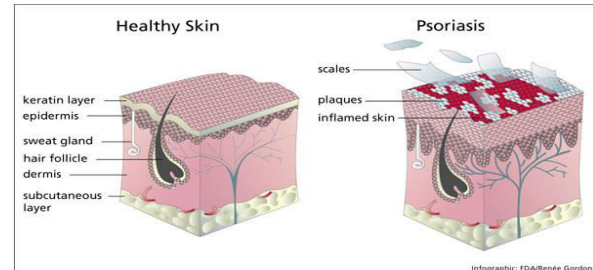
The prevalence of psoriasis varies widely depending on ethnicity. Psoriasis occurs most commonly in Caucasians, with an estimated occurrence of 60 cases per 100,000/year in this population. Its prevalence in the United States is 2-4 percent, although it is rare or absent in Native American and certain African-American populations. While common in Japan, it is much less common in China, with an estimated incidence of 0.3 percent. The prevalence in the general population of Northern Europe and Scandinavia is 1.5-3 percent. Women and men are equally affected by this condition. The observation that latitude affects prevalence is most likely related to the beneficial effect of sunlight on the disease.¹ Although psoriasis can occur at any age, the mean age of onset for chronic plaque psoriasis is estimated at 33 years, with 75 percent of cases initiated before age 46.² The age of onset appears to be slightly earlier in women than men. Longitudinal studies suggest spontaneous remission may occur in about one-third of patients with psoriasis.

PATHOGENESIS:

Skin is made up of two layers: Upper layer called epidermis and lower or inner layer called dermis. In healthy individuals epidermal cells on skin are continuously shed off and replaced by new layer of cells. The cells of the lower most layer of epidermis called keratinocytes gradually mature as soft mature cells as they rise from lower layer to upper layer to become the most superficial layer of cells. This process takes around 28 days and it is slowing insidious and almost inconspicuous as dead cells are efficiently cleared off and no debris is seen.

In Psoriasis regeneration of cells of epidermal layer is abnormally accelerated. It takes only 5-6 days instead of 28 days for the keratinocytes to travel the distance from lowermost layer to become the uppermost layer. In the bargain these cells do not

mature in such a short time and remain immature hard and scaly. Before the superficial layer is shed off & cleared new layer of immature & ill-formed cells is laid, this results in piling up of scales and thickening of skin.



skin cells grow deep in the skin and rise to the surface about once a month. In persons with psoriasis, this process is too fast. Dead skin cells build up on the skin's surface.

The following may trigger an attack of psoriasis or make the condition more difficult to treat: Avoid (PREVENTIVE MEASURES)

- Bacteria or viral infections, including strep throat and upper respiratory infections
- Dry air or dry skin
- Injury to the skin, including cuts, burns, and insect bites
- Some medicines, including antimalarial drugs, beta-blockers, and lithium
- Stress
- smoking
- Too little sunlight
- Too much sunlight (sunburn)
- Too much alcohol
- In general, psoriasis may be severe in people who have a weakened immune system. This may include persons who have:
 - AIDS

TYPES OF PSORIASIS

There are five types of Psoriasis

Plaque: Most common form of the disease

Plaque psoriasis is characterized by red skin covered with silvery scales and inflammation. Psoriasis is diverse skin disease.

In psoriasis people have only one type of Psoriasis at a time, but occasionally two or more different types of Psoriasis can occur at the same time.

Psoriasis can also occasionally change from one form to another. factors responsible to convert psoriasis from one form to another form such as pustular to Gutte.



Guttate: Appears as small red spots on the skin

The word guttate is from the Latin word meaning “Drop .

Psoriasis occurs in childhood or young adulthood.

This form of Psoriasis resembles small, red, individual spots on the skin. Guttate lesions usually appear on the trunk and limbs.

These spots are not usually as thick as plaque lesions.

A variety of conditions have been known to bring on an attack of guttate Psoriasis, including upper respiratory infections, streptococcal infections, tonsillitis, stress, injury to the skin and the administration of certain drugs (including antimalarials and beta-blockers).

A streptococcal infection of the throat (strep throat) is a common guttate Psoriasis trigger.



Inverse: Occurs in armpits, groin and skin folds

Inverse Psoriasis is found in the armpits, groin, under the breasts, and in other skin folds around the genitals and the buttocks.

Lesions are red and lack the scale associated with plaque Psoriasis. It may appear smooth.

Inverse Psoriasis is particularly subject to irritation from rubbing and sweating because of its location in skin folds and tender areas.

It is more common in overweight people and people with deep skin folds

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Pustular: White blisters surrounded by red skin

Mostly found in adults, pustular

Psoriasis is characterized by white pustules (blisters of non-infectious pus) surrounded by red skin.

The pus consists of white blood cells. It is not an infection, nor is it contagious.



It may be localized to certain areas of the body –for example, the hands and feet.

Pustular covering 90% of the body. Pustular Psoriasis r triggered by internal medications, irritating topical agents, overexposure to UV light, pregnancy, systemic steroids, infections, emotional stress

Erythrodermic Psoriasis affects most of the body surface.

It is characterized by periodic, widespread, fiery redness of the skin.

The erythema (reddening) and exfoliation (shedding) of the skin are often accompanied by severe itching and pain.

Edema (swelling from fluid retention), especially around the ankles, may also develop along with infection.

The body's temperature regulation is often disrupted, producing shivering.



DIAGNOSIS:

The diagnosis of psoriatic arthritis is typically made by a physician examination, medical history,

and relevant family history. Sometimes, lab tests and X-rays may be used to determine the severity of the disease and to exclude other diagnoses like rheumatoid arthritis and osteoarthritis.

Skin biopsy-Small sample of skin (biopsy) that's examined under a microscope to determine the exact type of psoriasis and to rule out other disorders. A skin biopsy is usually done in a doctor's office using a local anaesthetic.

RECENT DRUGS TO TREAT PSORIASIS

Retinoids and **Calcipotriol** are the most recent introductions in treatment. However the costs of these drugs are exorbitant in India.

RETINOIDS: The **retinoids** are a class of chemical compounds that are related chemically to vitamin A. Retinoids are used in medicine, primarily due to the way they regulate epithelial cell growth. Retinoid medicines are available as products that can be spread on the skin (gels, creams, or ointments) and as pills or capsules. Retinoid gels are usually applied once a day. Retinoid pills are usually taken either every other day or every day. Retinoids may be combined at low doses with other treatments, such as psoralen and ultraviolet A light therapy (PUVA), steroid creams or ointments, ultraviolet B (UVB) light exposure, and tar products. Retinoids should not be used by women who are pregnant or who are planning to become pregnant within 3 years after stopping retinoid treatment. The medicines are teratogens which means they can cause birth defects in a fetus

CALCIPOTRIOL: **Calcipotriol** or **calcipotriene** (USAN) is a synthetic derivative of calcitriol or vitamin D. It is used in the treatment of psoriasis marketed under the trade name "Dovonex" in the United States. It is used in cream, ointment or scalp solution (50 µg/mL), calcipotriol is applied twice daily to plaque psoriasis on the body or scalp, but not the face. Improvement is usually detectable within 2 weeks

PUVA THERAPY FOR PSORIASIS:

The goal of treatment is to control your symptoms and prevent infection.

Three treatment options are available

Systemic medications (those taken by mouth or injection)

Psoralens: In new reserch Methoxsalen (Oxsoalene-Ultra) and trioxsalen (Trisoralene) are commonly prescribed drugs called psoralens.

Psoralens make the skin more sensitive to light. Psoralens when combined with ultraviolet light acts against psoriasis called PUVA therapy.

This treatment is used when psoriasis is severe or when it covers a large area of the skin. Psoralens are taken by mouth several hours before PUVA therapy or sunlight exposure.

They are also available as creams, lotions, or in bath soaps

Therapy is usually given two to three times per week.

Adverse effects of PUVA therapy - nausea, itching, and burning. These drugs cause sensitivity to sunlight, risk of sunburn, skin cancer.

Alefacept (Amevive): In 2003, the FDA approved this drug for the treatment of psoriasis.

It suppresses the immune system to slow down the production of skin cells.

Alefacept is given as an injection once per week. Alefacept may increase the risk of malignancy or infection; may cause allergy or swelling of the throat or tongue

Acitretin (Soriatane-low dose retinoids): A modified vitamin A molecule.

Not effective as compared to methotrexate or cyclosporine in the treatment of plaque psoriasis. Controls the multiplication of cells.

In women of childbearing age, acitretin must be used with caution because of the risks of birth defects.

Drug requires long time needed for elimination, even after treatment is stopped, women must continue to avoid pregnancy for three years. Regular blood tests are required while taking this medication.

Adverse effect -dryness and irritation of the skin, lips, eyes, nose, thinning hair

Etanercept (Enbrel):

This is the first drug that the FDA approved for treating psoriatic arthritis.

It is a manufactured protein that works with the immune system to reduce inflammation. Etanercept is given as an injection two times per week.

The drug can be injected at home

Stelara: This drug blocks two proteins called interleukin-12 and interleukin-23, which are parts of the immune system.

Interleukins-12 and 23 promote the inflammation associated with psoriasis. Stelara is injected under the skin at weeks 0, 4, and every 12 weeks. Ustekinumab may increase the risk of malignancy or infection; it also may cause allergic reactions including skin rash, swollen faces

Cyclosporine): This drug suppresses the immune system and slows the production of skin cells. Cyclosporine is taken by mouth once a day.

Cyclosporine may increase the risk of infection or lymphoma and it may cause high blood pressure

Methotrexate (Rheumatrex): This drug is used to treat plaque psoriasis or psoriatic arthritis. It suppresses the immune system and inhibits an enzyme involved in the rapid growth of skin cells

Methotrexate is taken by mouth (tablet) or as an injection once per week.

Pregnant women should not take this drug.

What injections or infusions are available for psoriasis?

The newest category of psoriasis drugs is called biologics. All biologics modulate (adjust) and sometime suppress (quiet) the immune system that is overactive in psoriasis. Currently available biologic drugs include alefacept(Amevive), adalimumab (Humira), infliximab(Remicade), etanercept(Enbrel), and ustekinumab (Stelara).

PHOTOTHERAPY:

Some people may choose to have phototherapy. Phototherapy is a medical treatment in which your skin is carefully exposed to ultraviolet light. Phototherapy may be given alone or after you take a drug that makes the skin sensitive to light. Phototherapy for psoriasis can be given as ultraviolet A (UVA) or ultraviolet B (UVB) light

creams or lotions are available for psoriasis?

Topical (skin applied) medications include topical corticosteroids, vitamin D analogue creams calcitriol, topical retinoids (Tazorac), moisturizers, topical immunomodulators (tacrolimus and pimecrolimus) coal tar, anthralin, and others.

Topical corticosteroids (steroids, such as hydrocortisone) first-line treatment small areas of psoriasis.

These come in many preparations, including sprays, liquid, creams, gels, ointments, and mousses.

Steroids come in much different strength, including stronger ones are used for elbows, knees, and tougher skin areas and milder ones for areas like the face, under arms, and groin. These are usually applied once or twice a day to affected skin areas. A vitamin D analogue cream called calcitriol has also been useful in psoriasis. Immunomodulators (tacrolimus and pimecrolimus) have also been used with some success in limited types of psoriasis. These have the advantage of not causing skin thinning.

side effects- skin infections, possible malignancies (cancers).

Bath salts or bathing in high-salt-concentration waters like the Dead Sea in the Middle East may help some psoriasis patients. Epsom salt soaks (available over the counter) may also be helpful for a number of patients.

Coal tar products, including creams, gels, or ointments, to slow skin growth and reduce inflammation, itching, and scaling. . A major advantage with tar is lack of skin thinning

Salicylic acid, a peeling agent used to soften and reduce thick scaling. . These may be used one to three times a day on the body and do not generally have a risk of problematic skin thinning (atrophy). . These may be used one to three times a day on the body and do not generally have a risk of problematic skin thinning (atrophy).

Overuse or use on broken, inflamed skin may cause burning

Anthralin is available for topical use as a cream, ointment, or paste. Anthralin may be applied for 10-30 minutes to psoriatic skin. This act as a smooth emollient.

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