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Short Communication

Psoriasis

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Introduction

Psoriasis is a chronic autoimmune skin condition with no cure. It goes through cycles of flaring and remission. There is 2% worldwide prevalence of psoriasis out of which 11% Caucasian and Scandinavian population is affected [1]. Asian and African are the least affected populations. It presents at any age. Millions of people worldwide suffer from this disease. It not only leads to physical discomfort but also comes with other comorbidities and mental health disorders. Due to the nature of the disease, individuals often suffer from social anxiety and depression especially with the early onset of the disease. This review focuses on the discussion of causes, pathogenesis and treatment options currently available for psoriasis patients.

Though a cure is not available, treatment is aimed at reducing physical and psychological discomfort by treating the disease early on as well as identifying and addressing any comorbidities. The quality of life for people suffering from psoriasis can greatly diminish based on the severity of the disease. Smoking, obesity, stress and alcohol consumption are among the common triggers for psoriasis. Hence a healthy diet and lifestyle is recommended to ease discomfort.

Types and causes

Psoriasis involves hyperproliferation of keratinocytes. The exact cause of this event is unknown though it has a strong genetic predisposition. Environmental and immunologic factors play a strong role as well. There are different types of psoriasis. Psoriasis vulgaris is the most common type. Other types include Inverse Psoriasis, Guttate Psoriasis, and Pustular psoriasis. Psoriasis is diagnosed by a skin test.

Chronic Plaque psoriasis or psoriasis vulgaris: Around 80-90% cases of psoriasis are considered mild [3]. These are patients who have red, scaly plaques distributed as discrete patches in different areas of the body. The area covered by psoriasis varies from one patient to another. The cause of this type of psoriasis is genetic susceptibility of the individual in the presence of HLA-C*06:02 risk allele. Triggers include smoking, obesity, alcohol consumption, stress, certain drugs and infections.

- **Guttate Psoriasis:** It is most common in children and adolescents. It constitutes <10% cases of psoriasis [3]. Guttate psoriasis is known to be triggered by streptococcal infection. The disease presents as small lesions. Patients generally respond well to localized phototherapy treatment.
- **Inverse Psoriasis:** This occurs in intertriginous areas of the body where skin surfaces or folds touch or overlap each other. It is also more complicated to diagnose as it may easily overlap with other skin conditions. Inverse psoriasis constitutes <5% cases of psoriasis [3].
- **Pustular psoriasis:** Pustular psoriasis is different from plaque psoriasis as in this case instead of red, flaky/scaly patches of skin, patients develop pus filled lesions. It is localized in different areas of the body such as hands and feet. It can be life threatening combined with other comorbidities. Pustular psoriasis can make walking and other day to day activities extremely difficult if it is localized to hands and feet. Pustular psoriasis comprises of <5% cases of psoriasis [3].
- **Erythrodermic Psoriasis:** Erythrodermic psoriasis is a very rare variant constituting <2% cases of psoriasis [3]. It is full body psoriasis, covering >75% body surface area, and can be potentially life threatening. Much data is not available on this type of psoriasis due to the rarity of its occurrence.

Psoriatic disease is the term given to different ways psoriasis affects an individual. It includes cutaneous psoriasis and psoriatic arthritis. Around 20% individuals will go on to develop psoriatic disease at some point in their lifetime. Psoriatic arthritis is difficult to treat as fewer treatment options are available. 80-90% of patients with Psoriatic arthritis are affected by nail involvement.

Pathogenesis

Epidermis is the skin surface epithelium of the skin overlaying the dermis layer. It acts as a protective barrier against bacteria and germs from entering your body and causing infections. It consists mostly of keratinocytes, Langerhans cells, Markel cells and melanocytes. When this barrier is damaged due to any reason, the skin is exposed to harmful organisms/pathogens from the environment. In addition to psoriasis being painful, there is the added risk of being infected by pathogens due to the skin barrier being broken.

The hallmark of psoriasis is sustained inflammation that leads to uncontrolled keratinocyte proliferation and dysfunctional differentiation in the epidermis. The improperly matured keratinocytes result in red, dry and itchy/flaky skin that can be painful. The histology of the psoriatic plaque shows acanthosis (epidermal hyperplasia), which overlies inflammatory infiltrates composed of dermal dendritic cells, macrophages, T cells, and neutrophils. Neovascularization is also a prominent feature. The inflammatory pathways active in plaque psoriasis and the rest of the clinical variants overlap, but also display discrete differences that account for the different phenotype and treatment outcomes. Immunological studies have shown that Interleukin-17 (IL-17) and interleukin 23 (IL-23) are the main drivers of psoriasis pathogenesis along with activated dendritic cells. IL-17 and IL-23 play a crucial role in chronic inflammation and providing host defense against bacterial infections. IL-17 is produced by Th17 cells in response to triggers by IL-23 and other cytokines. Psoriasis is thought to be a IL17-A driven disease. IL-17A also stimulates keratinocytes to produce IL-19. IL-19 further increases the proliferation of keratinocytes [4]. In psoriasis, a feed forward inflammatory circuit is created by the effects of immune cytokines and auto antigen stimulation of immune T cells. This leads to cycles of inflammation at affected areas. Not only does psoriasis affects the skin due to uncontrolled growth of skin cells, it also affects the brain by dysregulation of the gut-brain-axis. Gut microbes can produce most chemicals found in the human brain. An imbalance of gut-brain axis can lead to depression and autism. In the case of psoriasis,

Treatment

- Topical, biologics, systemics, phototherapy and integrative medicine is available for psoriasis.
- Topical treatments are applied to the skin and are used for newly diagnosed to mild psoriasis. Systemic treatments can be biologics/biosimilars or oral drugs.

Biologics are protein-based drugs developed from living cells and administered by IV (Intravenous injection or infusion). Commonly prescribed biologics include Enbrel, Humira, Remicade, Simponi and Cimzia. These are all immunosuppressant drugs specifically tumor necrosis factor alpha or beta (TNF) inhibitors. They act by reducing the effect of inflammation causing substances in the body. Biosimilars are made after already FDA approved products.

Oral treatments are orally administered small molecule medicines. Conventional oral medicines examples are methotrexate, acitretin, apremilast, and cyclosporine.

Treatment is determined based on the severity of the disease and the presence of any other comorbidities such as cardiovascular disease. Topical treatments coupled with vitamin D3 analogues are the first line of defense for mild to moderate cases. Examples of topical treatments include corticosteroids, tacrolimus, and calcipotriol.

Phototherapy is also recommended for psoriasis combined with biologics. A combination of light and lasers with different mechanisms of actions are used in phototherapy. UVA (ultraviolet Light A), UVB (Ultraviolet Light B), PDT (photodynamic therapy), LED (Light emitting diodes) and (IPL) intense pulsed light are used for this purpose.

UV light is primarily used for plaque psoriasis. PDL is a good treatment option for nail or other localized psoriasis. A UV exposure starting at 50-70% of the minimal erythema dose (MED) is used for treatment. The dose is subsequently increased or restrained based on the skin response to therapy. Low level regimens of UV therapy are used as maintenance treatments.

Treatment options for psoriatic arthritis are even more tricky. All anti-tumor necrosis factor-α, anti-interleukin (IL)-17, and anti-IL-12/23 antibodies that are beneficial in treating plaque psoriasis are also helpful in the treatment of psoriatic arthritis.

Newer biologic drugs are assessed by a 'PASI 75' score, representing the percentage of patients achieving at least a 75% reduction in their Psoriasis Area and Severity Index [3].

Future Outlook

Psoriasis is a debilitating condition. Researchers are tirelessly working to provide a cure. With the current knowledge of psoriasis pathogenesis and the role of IL17/IL23 immune pathway and the psychological effects due to the dysfunction of the gut brain axis, better treatment options are possible for psoriasis and psoriatic disease.

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