REVIEW ARTICLE

Treatment Options for Psoriasis

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Psoriasis is chronic, hyperproliferative skin disorder that affects approximately 2% of the U.S. population. Treatment approaches focus on education, communication, and medications to control the disease and lessen the visible skin findings. These treatments can include moisturizers, topical steroids, vitamin D derivatives, and oral immunosuppresives. Physicians should remain aware of the common side effects, drug interactions, and toxicities of the regimens in order to prevent morbidities in these patients. Creating a therapeutic relationship with the patient will allow for optimization of the treatment plan and reduce patient anxiety and disease burden.

INTRODUCTION

Psoriasis is a multisystem disease affecting approximately 2% of the population[1] It Is a hyperproliferative state most commonly resulting in erythematous skin papules and plaques with a silver scale.[2] Psoriasis is a chronic condition that is present throughout a patient's lifetime with periods of waxing and waning often precipitated by the initiation or cessation of treatment.[2,3]

This article will briefly describe the varying types of psoriasis, pathogenesis of the disease, how to diagnose psoriasis, and an in-depth discussion of the numerous options available to treat psoriasis. We will outline the various treatments using a stepwise approach ranging from over the counter remedies for mild psoriasis to prescription medications used for severe psoriasis. A comparison of each treatment's indication, advantages, and disadvantages will also be presented along with illustrations on how to treat patients suffering from psoriasis utilizing an osteopathic approach by focusing on the body as a unit. The goal of this review is to provide a systematic technique that one can use in order to effectively treat psoriasis patients.

BACKGROUND

Various types of psoriasis are traditionally diagnosed using morphologic descriptions. It is common for clinical findings to overlap in more than one category resulting in the implementation of numerous treatment regimens to control the patient's varying disease states.[4]

Plaque

Plaque psoriasis is the most common form of psoriasis affecting 80 to 90 percent of psoriasis patients.[1] It is defined as scaly, erythematous, patches, papules, and plaques.[2] The severity of plaque psoriasis can range from only a few plaque lesions to numerous lesions covering most of the skin surface.

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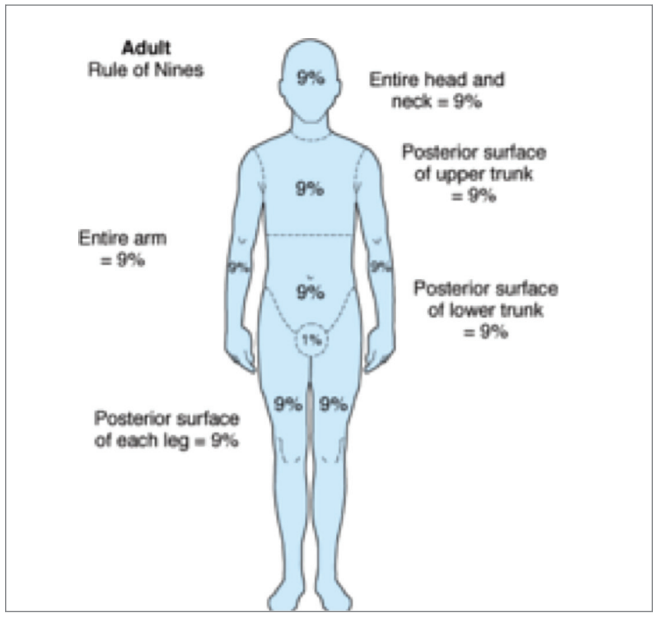
Mild to moderate disease affects approximately 80% of patients with plaque psoriasis and is defined as psoriatic lesions that cover less than 5% of the body surface area (BSA). Approximately 20% of patients are diagnosed with moderate to severe plaque psoriasis, which covers more than 5% of the body surface area or vital areas such as hands, feet, face, or genitals.[1,2,5,6] Chronic plaque psoriasis is often bilateral and symmetric.[7]

When diagnosing psoriasis, it is important to estimate the body surface area that is affected by the disease. This can easily be done using the "Rule of 9s." This divides the body into 11 equally sized areas including: head, chest, abdomen, back, buttocks, and bilaterally arm, front of leg, and back of leg each representing 9% of total body surface area.[8]

FIGURE 1:

Rule of 9's for body surface area



Erythrodermic

Erythrodermic psoriasis can result from chronic plaque psoriasis and is defined as generalized erythema that covers nearly the entire body surface area with varying degrees of scaling. As illustrated in Figure 2b, it can often appear as if the skin is severely burned. Fever, chills, and even dehydration due to fluid loss can accompany this variant of psoriasis.[4]

Guttate

Guttate psoriasis is characterized by salmon-pink drop lesions that are approximately 1-10mm in size.[1] This form of psoriasis typically has a sudden onset following a Streptococcal infection. It is seen more often in individuals younger than 30 years old *(Figure 2c)*.[4]

Inverse

Inverse or flexural psoriasis is described as lesions that develop within skin folds like axillae, groin, gluteal, and inframammary regions. Due to the moist nature of skin folds these lesions are typically erythematous plaques with minimal scaling *(Figure 2d)*.[1,4]

Other

There are various less common forms of psoriasis including pustular psoriasis, which can be an acute generalized condition (von Zumbusch variant) or localized to the palms and soles (palmoplantar). The von Zumbusch variant can be life threatening and is characterized by pustular lesions on an erythematous background often accompanied by fever and toxicity.[1,4] Palmoplantar psoriasis is less severe but may be functionally debilitating for the patient. These lesions can be of plaque or pustular type affecting the palms and soles.[4]

Comorbidities

Psoriasis is a complex disease of deregulated inflammation that is thought to have an immunologic pathogenesis. Due to chronic inflammation and suspected immunologic pathology there are several associated comorbidities that must be addressed when treating psoriasis.[4]

Patients with psoriasis have an increased risk of cardiovascular disease. These patients are typically overweight or obese (BMI>25), have a higher incidence of diabetes and hypertension, and decreased high-density lipoproteins. Even after correction for risk factors in individuals unaffected by psoriasis, the probability of a psoriasis patient experiencing a myocardial infarction was significantly higher.[9] Recent studies have shown that patients with psoriasis are at an increased risk for metabolic syndrome, which is the combination of type II diabetes, hypertension, central obesity, and combined hyperlipidemia (elevated LDL, decreased HDL, elevated triglycerides).[1,10]

It is also important to note the risk of psoriatic patients developing psoriatic arthritis; which occurs in approximately 10-25% of patients and is not related to the severity of psoriasis. The most common clinical pattern is oligoarthritis accompanied by tenosynovitis of one or more hand joints.[2] According to the American Academy of Dermatology up to 90% of patients with psoriatic arthritis may also have nail changes.[4] The recently developed CASPAR (classification criteria for PsA) criteria for diagnosing psoriatic arthritic includes nail changes as a predominant feature. Therefore, if nail changes are observed the clinician's level of suspicion for arthritis should increase.[11] It is also important to note that in a small percentage of patients the presentation of arthritis will precede any skin manifestations.[11]

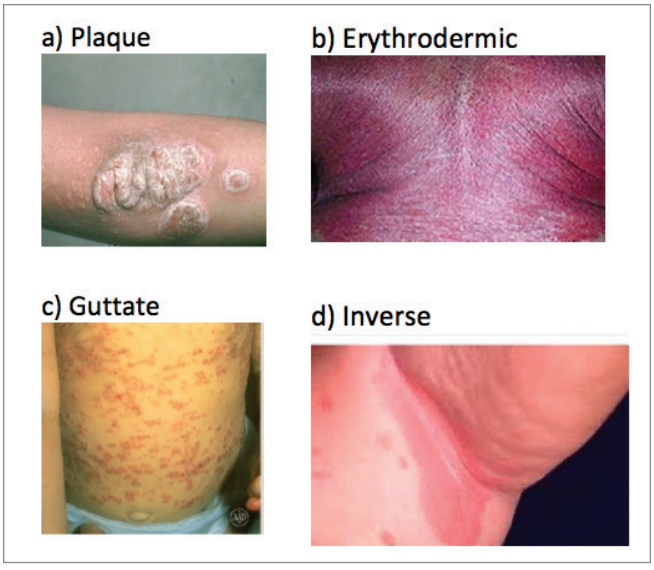
Apart from medical comorbidities, the prevalence of depression in patients suffering from psoriasis may be as high as 60%.[1] The psychological and emotional impact of psoriasis is difficult to assess since it may not reflect the severity of the disease. Psoriasis patients also have an increased prevalence of smoking and alcohol abuse.[1,6]

Diagnosis

The diagnosis of plaque psoriasis is based upon clinical evaluation of characteristic appearance and location of the lesions.[1,7] Most patients will complain of itchy lesions prior to diagnosis. Lesions typically present as papules and progress to form plaques. They most commonly appear on the scalp, ears, elbows, knees, umbilicus, gluteal cleft, nails, and sites of recurrent trauma.[2] The location and appearance of these lesions can significantly help distinguish psoriasis from other papulosquamous skin disorders.[3,7]

FIGURE 2:

Illustrations of differing types of psoriasis



MATERIALS & METHODS

In order to research the current information pertaining to the treatment of psoriasis, a literature review was conducted using the keywords of psoriasis, psoriasis treatment, and psoriasis management. Several different search engines were used to find the current and most appropriate treatment options to treat psoriasis including PubMed, Medscape, Up to Date, and Google Scholar. To supplement these search engines The Journal of American Academy of Dermatology, American Journal of Clinical Dermatology, and learning modules published by the American Academy of Dermatology were also used.

DISCUSSION

General Approach

It is important when diagnosing a patient with psoriasis to provide education on treatment options and communicate that psoriasis is a chronic condition with no cure.[2,6,7] It may also be beneficial to refer patients to an organization such as the National Psoriasis Foundation for more information and support groups.[3,6] Realistic expectations should be explained when determining an appropriate treatment regimen with the goal of treatment being to control the disease and lessen the appearance of skin lesions.[1,7]

Topical Treatment

Topical therapy is typically first line when treating psoriasis. This option is practical for patients suffering from localized lesions or mild to moderate psoriasis affecting less than 5% of BSA.[2,3,5]

Over the Counter

There are several over the counter treatment options for plaque psoriasis. The active ingredients in treatments approved by the FDA is tar and salicylic acid.[2,3] Salicylic acid is considered a keratolytic agent that causes the outer layer of skin to shed that helps to soften psoriatic lesions and reduce the appearance of scaling.[4] Although rare, the concern of using salicylic acid is the potential for systemic absorption if it is applied to >20% BSA.[5] It can decrease the efficacy of UVB phototherapy and should be avoided prior to treatment.[2]

Tar acts to slow the hyperproliferative state of the skin and restore its appearance by suppressing DNA synthesis through lessening the mitotic labeling index of keratinocytes.[3,5] Tar also has an added benefit to reduce inflammation, itching, and scaling of psoriasis; however, it is often poorly tolerated by patients due to the foul odor, contact dermatitis, and tendency to stain clothing.[5]

Other topical treatment options available that do not contain these active ingredients can be beneficial especially if used concomitantly with other treatments. For example, heavy cream moisturizers and ointments can help skin retain moisture and reducing redness and itching. Bath solutions containing oil, oatmeal, and salts also aid in removing scales and soothing the skin.[2,4,7]

Topical Steroids

Corticosteroids are considered the main stay of topical treatments.[2,5-7] This treatment acts as an anti-inflammatory, anti-proliferative, immunosuppressant and vasoconstrictor by affecting gene transcription.[1] There are a variety of strengths and formulationsavailable that helps tailor treatment for each patient. The potency of each formulation is based on the medication's ability to produce vasoconstriction at the site of application ranging from weak to super potent preparations.

Indications

Topical corticosteroids are the first line agent for localized psoriasis (<5% BSA) and can be appropriately managed by primary care providers. When deciding on the appropriate potency for treatment the disease severity, location being treated, patient preference, and patient age are all factors that should be taken into consideration.[5,6,12] Lower potency formulations (hydrocortisone 1%) should be used on the face and intertriginous areas for a limited amount of time. The use of mid or high potency agents (betamethasone 0.05% or clobetasol propionate 0.05%) are considered appropriate for treatment of psoriasis affecting other areas of the body. The typical regimen includes two daily applications until clinical improvement occurs in which administration frequency should be reduced.[5,6]

Numerous double-blind, placebo-controlled studies have found that the use of topical corticosteroids improve psoriasis plaques; however these studies show a wide range of efficacy and only average several weeks which inhibits the assessment of long-term therapy *(See Table 1)*.[5]

Due to the variation in study design and populations make it difficult to compare each of these studies. However, a systematic review by Mason et al. has demonstrated that potent and very potent formulations are more effective at improving psoriasis plaques than mild or moderate corticosteroids.[5,13]

Disadvantages

Although topical corticosteroids are proven to have clinical benefit when treating limited plaque psoriasis, they also have side effects that must be considered. The main disadvantage to using topical treatments is lack of adherence.[5,6] This is mainly attributed to inconvenience, cost, and lack of immediate response. In order to combat the issues it is important to choose the most appropriate therapy by balancing potency to achieve a desirable outcome while also choosing a vehicle that can be tolerated by the patient.[3-6]

Topical corticosteroids are also associated with potential side effects. It is common for patients to experience local cutaneous skin atrophy, telangiectasia, striae distensae, acne, folliculitis, and purpura.[5-7] Systemic side effects are rare but can occur with long term use of potent or super potent formulations over a large BSA.[2,5] These side effects include Cushing's syndrome, osteonecrosis of the femoral head, cataracts, and glaucoma. To avoid the potential complications it is recommended that the use of class I topical steroids be limited to no more than twice daily for 2-4 weeks. Longer duration of therapy can be utilized, but appropriate monitoring including regular skin checks to assess for atrophy should be employed.[5] It is also important to note that when utilizing a potent to super potent formulation therapy should be tapered.[5] The use of topical steroid in pregnant patients is category C with unknown safety in nursing mothers.[5]

Advantages

A major advantage associated with topical corticosteroid treatment is the various strengths and formulations available. In addition to selecting the appropriate strength for your patient a variety of vehicles are also available which can significantly alter the use and penetration of the medication. Vehicle types include ointments, creams, solutions, gels, foams, tape, spray, shampoo, oils, and lotions.[3,5,6] It is important to choice a vehicle option that the patient will most likely use at the targeted site. For example, when treating the scalp shampoos, foams, or sprays are common and the patient is able to select their preference. The vehicle of choice may alter the class; for instance, flurandrenolide 0.1% as a cream is a class V, but a class I when used as a tape.[5]

TABLE 1:

Range of efficacy for each class of topical corticosteroids used in psoriasis treatment.

Class of Topical Steroid (1 - 7)	Range of Efficacy Rates	Average Duration of Therapy (weeks)
1 (Superpotent)	58% - 92%	2
2 (Potent)	68% - 74%	2.5
3, 4 (Midstrength & upper midstrength)	68% - 72%	6.7
5, 6, 7 (Least potent, midstrength, & lower midstrength)	41% - 83%	3

Non-Steroidals

In addition to topical corticosteroid treatment there is a variety of non-steroidal topical treatment options.

Vitamin D Derivatives

These formulations include calcipotriene and calcitriol, which act by binding to vitamin D receptors inhibiting keratinocyte proliferation and enhancing keratinocyte differentiation.[5] Calcipotriene has been proven effective through a systemic review of randomized control trials where only potent topical corticosteroids appeared to have a comparable outcome at 8 weeks. 70% of patients with 5-20% BSA affected by plaque psoriasis showed greater than 75% improvement in their condition compared to 19% of vehicle-treated patients.[14] Calcitriol has an additional mechanism to treat psoriasis by inhibiting T-cell proliferation and other inflammatory mediators.[6] In a systemic review, calcipotriene and calcitriol showed equal efficacy, but calcitriol appeared to be less irritating on sensitive areas of the skin compared to calcipotriene.

The greatest benefit of topical vitamin D derivatives are when used in conjunction with topical steroids.[6] Combining the use of both products has been proven to show greater benefit than with the use of either agent alone.[5]

Indications

The use of vitamin D derivatives in treatment of plaque psoriasis is considered an alternative first-line therapy.[6] For optimal therapy, a combination of topical steroids and vitamin D derivatives should be used.

Disadvantages

Side effects for vitamin D derivatives are minimal. However up to 35% of patients may experience local skin irritation including burning, pruritus, edema, peeling, dryness, and erythema.[2,15] Systemic side effects with this treatment are possible but extremely rare unless the patient is applying more than the recommended dosage of 100g/week. These side effects can include hypercalcemia and parathyroid suppression.[15] The biggest disadvantage of vitamin D derivatives is their cost compared to many generic potent corticosteroids.[6] This product is a pregnancy category C.[15]

Advantages

Vitamin D derivatives have been proven to provide improvement to plaque psoriasis, especially when used in combination with topical corticosteroids.[2,6,15] It has also been shown that with continuous use local side effects are often diminished.[7]

Retinoid

The class of drugs, specifically tazarotene, is commonly used for acne and psoriasis.[4] It works my normalizing keratinocyte differentiation, diminishing hyperproliferation, and by decreasing expression of inflammatory makers.[5] This drug has been proven safe and effective in two randomized, vehicle-controlled trails.[6] Daily administration of tazarotene gel (0.05% or 0.1%) compared favorably with the twice-daily administration of topical fluocinonide 0.05%. Furthermore, it was proven that the 0.1% cream was more effective than 0.05% cream, but had a higher incidence of local side effects.[5,6] Similarly to vitamin D derivatives, tazarotene is most beneficial when used in combination with topical corticosteroids.[2,5,6]

Indications

The use of tazarotene is an alternative first-line agent that should be used with topical corticosteroids for optimal therapy.[2,5,6]

Disadvantages

The major side effects of tazarotene are local irritation, dryness, potential photosensitizing effect, and its teratogenic properties.[2,4,5] For this reason, tazarotene is considered Pregnancy category X.[5]

Advantages

Combining this product with topical steroids or moisturizers has shown to decrease the prevalence of local irritation.[2,5,6]

Calcineurin Inhibitors

Tacrolimus and pimecrolimus, two calcineurin inhibitors used to treat psoriasis, act by blocking the synthesis of numerous inflammatory cytokines that play a role in psoriasis.[5]

Indications

The use of calcinineurin inhibitors is most effective when used on thinner skin such as the face and intertriginous regions.[5,6] Two separate eight week randomized trials found that the use of these agents show clearance of lesions or excellent improvement versus the placebo. However, a separate study of 80 patients with intertriginous psoriasis showed that the use of betamethasone valerate 0.1% was more effective than pimecrolimus.[6] It is recommended that these agents be used when topical treatment of the face or intertriginous regions are required for a prolonged period. The use of these agents has reduced side effects compared to the long-term risk of skin atrophy seen in chronic topical corticosteroid use.[5]

Disadvantages

The most common adverse effects of these medication is local burning and itching, which appears to be more significant in patients treated with tacrolimus ointment versus pimecrolimus cream.[2,5] These drugs also have a black box warning due to the lack of long-term safety data. In 2005, there was an alert placed on these medications about a potential link with cases of lymphoma and skin cancer; however, no definite causal relationship has been established.[5,6] This treatment is considered a pregnancy category C.[5]

Advantages

The efficacy of calcineurin inhibitors on sensitive areas such as the face and intertriginous regions is their biggest advantage. The ability to use this treatment without the long-term side effects of chronic topical corticosteroids is also very beneficial.[5,7]

Anthralin

The use of anthralin was formally the mainstay of treatment.[5] The exact mechanism in which this drug works is not completely understood; however, it is thought that anthralin acts by preventing T-lymphocyte activation and normalizes keratinocyte differentiation by acting directly on the mitochondria.[5]

Indications

This formulation is no longer commonly used due to its cosmetic side effects.[7]

Disadvantages

Anthralin commonly causes local skin irritation and staining of lesional and paralesional areas.[2,5] It has been demonstrated that anthralin is less efficacious than topical vitamin D or potent topical corticosteroids.[7] Anthralin is a pregnancy category C.[5]

Advantages

Physicians can use this medication as a short contact treatment in an outpatient setting. In patients with well-defined lesions, petrolatum or zinc oxide can be applied to the surrounding area prior to application of anthralin to the lessen the adverse effects.[5]

Combination Therapy

Topical therapies are most beneficial when used together with other topical Treatments.[5] There are several formulations available in order to achieve maximal therapy.

Corticosteroid & Salicylic Acid

Salicylic acid has been shown to improve the efficacy of corticosteroids by increasing penetration.[5] To ensure the risk of toxicity is not increased when adding salicylic acid to steroid treatment it is recommended that the corticosteroid should not exceed medium potency. The use of this combination is a category B recommendation and should be used when treating especially thick or scaly plaques.[5]

Corticosteroid & Vitamin D Derivatives

This combination is more efficacious than the benefit of using either as monotherapy.[2,5,6] In a four-week trial study with 1603 participants 48% of patients treated with combination calcipotriene 0.005% and betamethasone 0.064% achieved clear or almost clear results compared to 16.5% and 26.3% in patients treated with calcipotriene or betamethasone alone, respectively.[5] The use of this drug in treating plaque psoriasis in all areas of the body excluding the face is a grade A recommendation and should be considered as a first line agent when choosing an initial topical therapy option.[5]

Corticosteroid & Tazarotene

It has been demonstrated that adding topical corticosteroids to tazarotene reduces the irritating side effects of tazarotene.[4,7] Combination therapy has several potential benefits including increasing the duration of treatment benefit, increasing length of remission, and decreasing steroid induced atrophy.[5,6] This combination is a category A recommendation and could be considered first line when determining an option for optimal topical therapy.[5]

Systemic Therapy

Conventionally systemic treatment options are reserved for patients with severe psoriasis (>10%BSA); however some patients with limited psoriasis have been treated with systemically if their condition is causing debilitating symptoms such as lesions localized to palms, soles of the feet, or scalp.[2,6] Patients being treated systemically for there psoriasis should be seen regularly by a dermatologist, but it is important as a primary care physician to be aware of the potential side effects of the systemic agents, be able to recognize and monitor for adverse effects.[1,2] There are three treatment modalities that are commonly used, phototherapy, oral medications, and biologic agents.

Phototherapy

UVA and UVB wavelengths have been used to treat psoriasis. It is thought they have a direct immunosuppressive effect on Langerhans cell and an indirect immunosuppressive effect on cytokines by blocking the activation of T-helper cells.[6,16] The most commonly reported adverse effects of this therapy is erythema, itching, burning, and stinging; these typically can be managed by altering the duration of therapy. UVA and UVB therapy should be managed by a dermatologist with appropriate training and expertise in this area in order to minimize adverse effects.[4,16] Patients with a known history of lupus erythematosus or xeroderma pigmentosum should avoid phototherapy. Any patient with a positive history for melanoma, multiple risk factors for melanoma, are immunosuppressed resulting from organ transplant or taking photosensitizing mediations should be carefully screened prior to starting therapy.[6,16] As a primary care physician it is important be cautious of any changes in medication regimens that may increase a patient's susceptibility to adverse effects while receiving phototherapy. The largest concern with UVA phototherapy is the increase risk for non-melanoma and melanoma skin cancer; however, several studies have failed to show this correlation with UVB therapy.[16] It is also important to note

that pregnancy is not a contraindication to receiving UVB therapy and should be considered first line therapy in patients requiring a systemic approach with plaque or guttate psoriasis.[16]

Oral Therapy

The three most commonly prescribed oral agents for treating severe psoriasis is methotrexate, cyclosporine, and acitretin.[2,7] Each of the medications have different mechanisms of action and require various monitoring; however they are all known to cause organ toxicities. In 2014, the US Food and Drug Administration approved a new oral medication, apremilast, to treat patients with moderate to severe psoriasis.[6]

Methotrexate

Oral methotrexate competitively inhibits dihydrofolate reductase, which decreases the synthesis of folate cofactors required to make nucleic acid. When used at a therapeutic low dose methotrexate acts to suppress the immune system through inhibiting the proliferation of lymphoid tissue.[15] It is common for patients taking methotrexate to experience mild nausea, fatigue, anorexia, and stomatitis. These adverse effects can be reduced by splitting the dose, administering before bed, or by supplementing with folate.[6,15] Methotrexate is also associated with pulmonary fibrosis, hematologic abnormalities, and hepatotoxicity. Prior to the initiation of therapy patients should receive a thorough physical along with lab testing to include CBC with differential, liver function tests, and creatinine.[15] Pulmonary fibrosis should also be ruled out in any patient presenting with new pulmonary symptoms such as a cough. It is important to avoid prescribing other hepatotoxic drugs or drugs that may interfere with renal excretion of methotrexate including NSAIDs and penicillins. Methotrexate is contraindicated in pregnancy and lactation.[6,15]

Cyclosporine

This drug is a calcineurin inhibitor, which leads to decreased levels of IL-2, IL-4, and inhibits activation of T-cells.[4,15] Cyclosporine is typically reserved for treatment of significant flares that are unresponsive to other therapies, patients with severe psoriasis, or as a bridging agent when new systemic agents are being introduced.[15,17] It is associated with nephrotoxicity, hypertension, hypertriglyceridemia, and increased risk for developing cutaneous squamous cell carcinoma.[15] Due to the nephrotoxicity and hypertension associated with usage, monthly creatinine levels and yearly glomerular filtration rates are indicated.[4,15] Patients with creatinine levels greater than 25% of baseline on two separate occasions should decrease their dose 25%-50%.[15] A dose reduction should also be considered in patients with no previous history that develop hypertension. Cyclosporine is metabolized by cytochrome P450 isoenzyme CYP3A4, indicating careful evaluation of other medications prior to initiating therapy.[6,15] It is also important to keep this in mind when changing the patient's medication regimen for any other comorbid conditions. As with any systemic therapy for treating psoriasis a thorough history and physical with labs should be conducted prior to prescribing cyclosporine. Cyclosporine is contraindicated in combination therapy with PUVA or UVB due to the increase risk of squamous cell carcinoma. This drug is category C for pregnant patients.[15]

Acitretin

Oral retinoids are vitamin-A derivatives that act to treat psoriasis by modulating epidermal proliferation and differentiation by exerting an anti-inflammatory and immunomodulatory effect.[15] There are several adverse effects that have been associated with acitretin; the most severe being its teratogenicity. It is pregnancy category X due to its potential to cause cardiovascular, ocular, auditory, central nervous system, craniofacial, and skeletal abnormalities.[6,15] The half-life of acitretin is significantly increased with the ingestion of alcohol; potentially taking up to three years for the drug to be eliminated from the body and therefore should be avoided in women of childbearing age.[15] It is common for patients taking acitretin to experience mucocutaneous side effects including dry eyes, nasal and oral mucosa, hair loss, and epistaxis in varying degrees. Patients who are being maintained on acitretin should obtain a lipid profile every 2 weeks for the first 8 weeks and then every 6-12 weeks after that due to the reported effect on triglyceride levels. Adverse effects of acitretin may be exacerbated when taken concomitantly with drugs that are metabolized by cytochrome p450.[15] Studies have shown that acitretin in combination with phototherapy is more effective than either as monotherapy and decreases the risk for squamous cell carcinoma.[6] Prior to initiating therapy it is important to conduct a thorough history and physical, obtain a pregnancy test, lipid profile, and liver function tests.[6,15]

Apremilast

This newly approved treatment acts by inhibiting phosphodiesterase-4 leading to a reduced production of cytokines that are thought to be involved in the pathogenesis of psoriasis.[6] In two randomized trials, 33% and 29% of patients taking apremilast achieved a 75% improvement in their psoriasis compared to 5% and 6% of the placebo groups.[6] The reported success rate of this treatment option is lower than those achieved by cyclosporine, TNF-α inhibitors, and ustekinumab.[6] Apremilast has been reported to cause short-term diarrhea typically occurring during the onset of treatment and improving with continued use.[6] Research has demonstrated that titrating patients up to the recommended dose improves the tolerability of treatment. Other commonly reported side effects of apremilast include nausea, upper respiratory infection, headache, weight loss, and an increased risk for depression.[6] Apremilast is metabolized by cytochrome p450 and has been shown to have a reduced efficacy if given with an inducer. It is also recommended to reduce the dose of Apremilast in patients with severe renal impairment (CrCl < 30mL/min).[18] Safety and efficacy of this treatment option has not been established in patients younger than 18 years old. It is classified as pregnancy category C and has not been adequately studied in pregnant women.[18]

Biologic Agents

Biologic agents are a relatively new approach to treating psoriasis and are most commonly administered subcutaneously or intravenously.[7] The biologic therapies that are currently available in the United States include etanercept, infliximab, adalimumab, which all act to inhibit TNF-α, and ustekinumab, which is a human monoclonal antibody that targets IL-12 and IL-23. Biologic agents are routinely used when traditional systemic agents fail or are unsuitable due to comorbidities.[1,6]

TNF-α Inhibitors

Etanercept, infliximab, adalimumab all act by inhibiting the pro-inflammatory cytokine TNF-α.[1,7] Each of these drugs increases the risk of infection particularly in the upper respiratory tract.[7] Due to the subtle presentation of this adverse effect, it is important to conduct regular monitoring in these patients.

In the event the patient requires treatment with antibiotics, the TNF inhibitor should be withheld and should be avoided in any patients with chronic or recurring infections.[1] It has also been noted that TNF-α has an important role in the host response to tuberculosis (TB), putting patients taking TNF-α inhibitors at an increased risk for developing TB or experiencing a reactivation of TB. Prior to initiating therapy all patients should obtain testing for TB.[1,6,7] Additional adverse effect of this medication is the association with peripheral and central demyelinating disorders, heart disease, drug-induced lupus-like syndrome, hepatic disease, lymphoma, and skin cancer.[1] These effects warrant ongoing physical exam, TB testing, CBC, and LFT.[1,7] In general TNF-α inhibitors should be avoided in patients who have Multiple Sclerosis (MS), a first-degree relative with MS, or any active infection. Extreme caution should also be taken when prescribing TNF-α inhibitors to patients with heart failure. Due to its immunosuppressive effect, it is also important patients to avoid any live vaccinations. These drugs are considered pregnancy category B.[1]

IL-12/23 Blockers

The FDA approved use of Ustekinumab in 2009 to treat patients with moderate to severe psoriasis.[6] There has been occasional injection site reaction and rare reports of serious infection and cardiovascular events with usage of this drug. It requires similar monitoring as the other biologic agents including PPD, LFT, and CBC with ongoing physical examination. Ustekinumab is also a pregnancy category B.[6, 17]

Additional Treatment

The evidence linking psoriasis to metabolic disease is rapidly expanding and although this association does not infer causality it is vital that patient's with psoriasis be evaluated for the concomitant presence of these diseases.[10,12] By using a targeted intervention approach for patients with psoriasis, early detection of diseases that are in the spectrum of metabolic syndrome can help reduce mortality.

In addition to screening, patients should be encouraged to correct any modifiable cardiovascular risk factors including smoking cessation and lowering their BMI.[10,12] Although the predominant visual manifestation of psoriasis is cutaneous, it also affects the patients mind, body, and spirit. It can be a very aggravating disease for patients and it is vital that as a provider you spend adequate time with these individuals to address every aspect of the disease.[6] Patients suffering from psoriasis have an increased risk for psychological disorders and psychosocial disability due to the affected perception of themselves.[1,6] These symptoms can be alleviated with counseling, support groups, or psychoactive medications.[6] Due to the immunologic pathogenesis of psoriasis, it is also important to maintain the osteopathic principle that the body is capable of self-regulation, self-healing, and health maintenance. Treating the whole patient by addressing mind, body, and spirit can help improve overall quality of life.

CONCLUSION

Psoriasis is a chronic inflammatory condition affecting approximately 2% of the Population.[1] There are several approaches to treating this disease ranging from over the counter treatments to biologic injectable agents. An algorithm for approaching the treatment can be found in Figure 3. Treatment is based off the type of psoriasis and where on the body the patient is affected. When managing patients suffering from psoriasis it is important to consider the effect it has on the mind, body, and spirit paying close attention any psychological changes and monitoring for co-morbid conditions such as metabolic syndrome. The treatment of psoriasis can be complex and very frustrating for patients. With appropriate monitoring and collaboration with a dermatologist as needed, can help patients set realistic treatment goals and have an increased quality of life.

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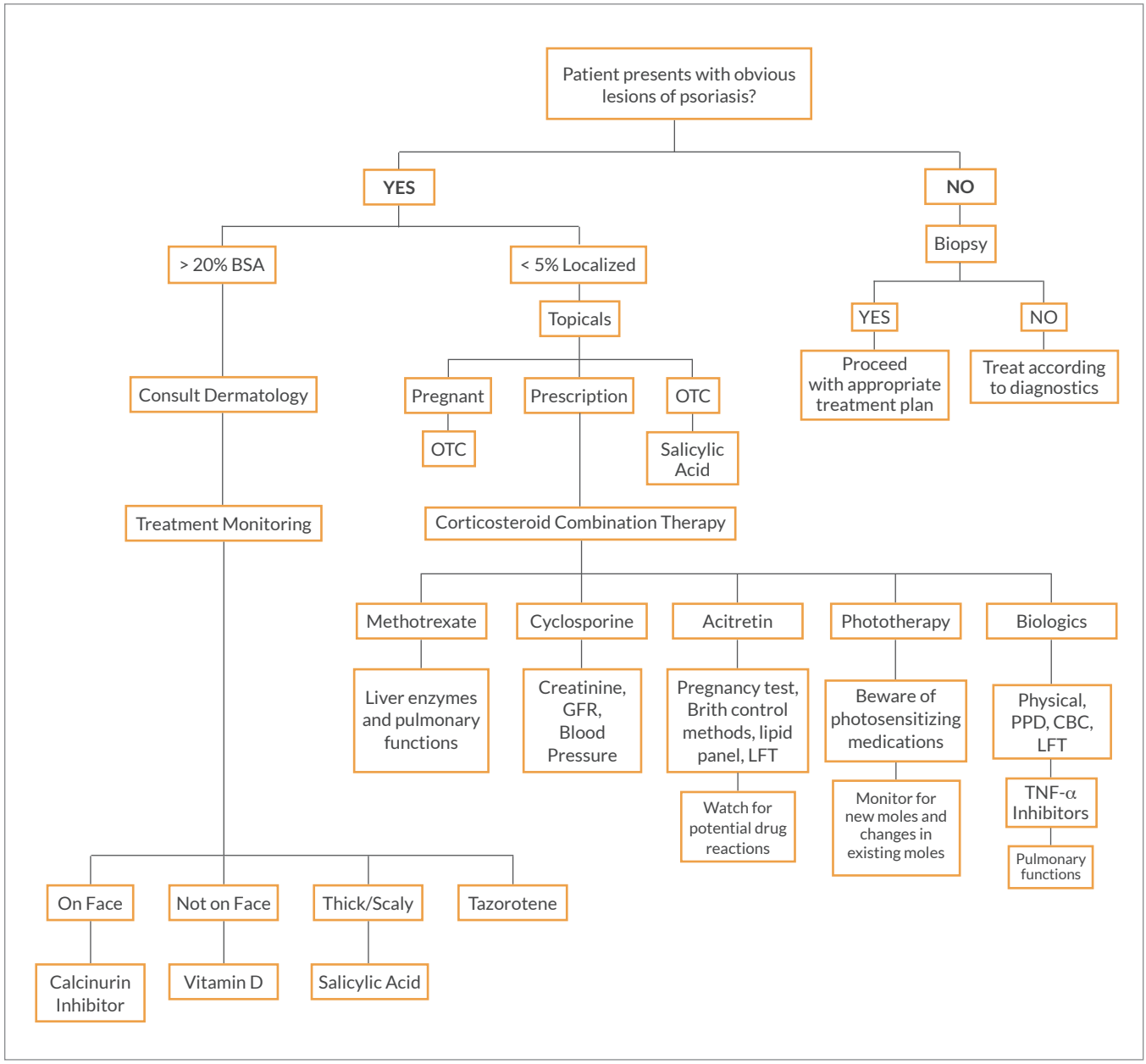
FIGURE 3:

Treatment Algorithm for Psoriasis



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