PSORIASIS IN MILITARY SOLDIERS: CHALLENGES AND POTENTIAL SOLUTIONS

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Introduction: Psoriasis is an chronic immune-mediated inflammatory disease that affects skin, nails and joints. Exacerbation can lead to systemic inflammation and cardiovascular comorbidity [1,2]. Psoriasis affects both females and males and those with a family history. Its peak onset age exhibits a bimodal distribution, 18–29 and 50–59 years in women and 10 years later in men [1]. This condition can arise within the period of military service, which presents a significant concern.

Methods: The PubMed and Medline databases were used to conduct the review’s literature search. To find publications on the subject, the following search phrases were used: “psoriasis” AND “military” OR “active-duty” AND “dermatology” OR “skin diseases”. Studies published between 2016 and 2023 were included. An expanded search was performed using the publications’ reference lists.

Discussion:

Risk factors. The pathogenesis of psoriasis is multifactorial, with a heritability component that is estimated to be 60-90% [1]. The risk factors can be divided into two groups: extrinsic and intrinsic risk factors. External factors include air pollutants, excessive sunlight, drugs (β-blockers, Imiquimod, immune check point inhibitors, biologics targeting TNF-α, IL-23, and IL-17 etc.), vaccination, infections (Streptococcus, Candida, Malassezia, HIV), smoking and alcohol consumption [2]. Psoriasis might be provoked shortly after infection with COVID-19 or COVID-19 vaccination and observed with either new-onset or flares of previously well-controlled psoriasis [3]. Various injuries can trigger psoriasis in uninvolved areas, this is known as the Koebner phenomenon. For military soldiers who sustain injuries on a regular basis, this occurrence is crucial. Intrinsic risk factors associated with exacerbation such as obesity, diabetes mellitus, hypertension and mental stress. Stressors influence behavioral patterns of worrying and scratching. Scratching in reaction to an itch causes an itch-scratch-itch cycle, which worsens the condition [2]. Psoriasis may have a bidirectional connection with sleep, i.e. indicate an association between sleep deprivation and psoriasis disease progression. It might have a significant influence on service members, who are at an increased risk for short sleep duration [4].

Psoriasis varieties and symptoms. Most individuals with psoriasis may experience itching, fever, and discomfort. Psoriasis has various forms, including plaque, flexural, guttate, pustular, or erythrodermic. Plaque psoriasis, the most common type, is characterized by salmon-pink plaques with silvery-white scales on
extensor surfaces, especially the elbows, knees, trunk, and scalp. Flexural psoriasis affects areas like the axillae, sub-mammary, and genital regions without significant scaling. Guttate psoriasis leads to a sudden symmetrical outbreak of drop-like papules/plaques, often preceded by a streptococcal infection. Nail involvement occurs in up to 50% of patients, presenting as nail pitting, onycholysis, oil spots, dystrophy, and subungual hyperkeratosis. In severe cases, psoriasis can result in erythroderma, posing a life-threatening risks due to complications such as hypothermia, acute kidney failure, and high-output cardiac failure, risk of infection [1].

Psoriasis military challenge. Soldiers with moderate to severe psoriasis do not meet military admission standards, so these personnel likely would not be deployed. As a result, the rate of dermatological consultation for psoriasis is approximately 2.1% [4]. This skin disease may also manifest in soldiers after entering service. Psoriasis can impair a service member’s ability to perform job-related activities as it leads to discomfort while wearing body armor, helmets, military boots and other military gear. Thus, it should be treated. However, some military members choose not to actively manage their psoriasis if it is limited in nature and not symptomatic. [5]

Treatment. Psoriasis can be treated with topical options (vitamin D analogues and corticosteroids), phototherapy, standard systemic (methotrexate, ciclosporin and acitretin), biologic (tumor necrosis factor (TNF), interleukin (IL)-17 and IL-23 inhibitors) or small molecule inhibitor (apremilast) therapies.

Topical corticosteroids provide high efficacy and safety. These agents exert anti-inflammatory, antiproliferative, immunosuppressive, and vasoconstrictive effects through intracellular corticosteroid receptors, regulating gene transcription, including those for proinflammatory mediators. Lower potency corticosteroids are recommended for sensitive areas, while classes 2 through 5 (moderate to high potency) are typically initial therapy for adults. Using class 1 (ultrahigh-potency) corticosteroids often required for thick, chronic plaques. Studies indicate topical corticosteroids effectiveness within 2 to 4 weeks for mild to severe plaque psoriasis. Common adverse effects (AEs) include skin atrophy, striae, folliculitis, telangiectasia, and purpura. Abrupt withdrawal of topical corticosteroids can cause rebound exacerbation [6].

Vitamin D analogs like calcipotriene and calcitriol influence psoriasis by binding to vitamin D receptors, inhibiting keratinocyte proliferation, and promoting differentiation. Studies indicate 4 to 8 weeks of treatment with these compounds is safe and effective for managing mild to moderate psoriasis [6].

Other topical treatments for psoriasis include tazarotene, moisturizers, SA, anthralin, and coal tar. The efficacy of topical treatment can be increased with in combination with systemic therapies [6]. Second-line therapy includes phototherapy (narrowband ultraviolet B radiation (NB-UVB) and psoralen with ultraviolet A radiation (PUVA)) and conventional systemic agents. Due to risks of skin cancer with cumulative doses of PUVA, NB-UVB has largely superseded it [1].

Methotrexate works by inhibiting lymphocytes via multiple mechanisms including dihydrofolate reductase inhibition, aminoimidazole carboxamide ribotide transformylase blockade and adenosine accumulation. Most common AEs are bone marrow suppression, nausea, pneumonitis, hepatitis, liver fibrosis and teratogenicity. Methotrexate is usually taken orally every week. However subcutaneous formulation causes less gastrointestinal AEs and is more effective due to higher bioavailability. It requires regular laboratory monitoring (LM) at 3-month intervals or more frequently with dosage changes. Ciclosporin is a calcineurin inhibitor and has a rapid onset of action, but may cause hypertension and irreversible renal toxicity. Its usage is usually limited to 1 year and requires monthly blood pressure checks and at least quarterly LM. Acitretin is an oral retinoid that promotes keratinocyte differentiation. Its possible side effects include dry skin, hair loss, hyperlipidemia and hepatotoxicity. Acitretin is
retained in fat cells and can be detectable in the blood for up to 3 years. During this period, patients' pregnancy is contraindicated and donating of blood is restricted [1, 7].

For disease refractory to second-line therapies or not suitable, biologic therapies or oral small molecule inhibitors may be considered [1].

Biologics are monoclonal antibodies or soluble receptors that target proinflammatory cytokines. They have had a dramatic impact on outcomes in moderate–severe disease. Multiple biological therapies are approved such as TNF (e.g. adalimumab), IL-12/23p40 (e.g. ustekinumab), IL-23p19, IL-17A receptor inhibitors (e.g. secukinumab). The choice of biologic needs may be tailored to the needs of each patient. Biologics require less LM, but can cause immunosuppression (adalimumab, ustekinumab) or refrigeration is needed (adalimumab, secukinumab) [1, 7].

Apremilast is a small-molecule inhibitor of phosphodiesterase, a versatile and easy-to-use therapeutic option. It's easy to transport and store, has minimal necessary LM. It also emerged as a recommended treatment of psoriasis during the COVID-19 pandemic. Apremilast does not have potential to immunosuppression, that is necessary if having live virus vaccination is needed. Common AEs include weight loss, diarrhea and nausea is self-limited. Gastrointestinal AEs improve or resolve after the first few weeks of therapy. [8]

Treatment consideration in the Military. The psoriasis treatment during deployment is limited due to requirements for having low toxicity, simple storage, and minimal LM, and it should not expose a service member to increased risk while in warfare. [8] Most service members with limited psoriasis vulgaris can be managed with topical steroids and steroid-sparing agents such as calcipotriene.[5] Apremilast, is another treatment option, with no AEs on deployability, but is more expensive compared to several biologics. The high expense of training a soldier, particularly those in specialized tasks, may justify the adoption of more expensive treatment [7]. If patients do not improve in 4 months with apremilast, then standard systemic or biologics should be considered. It has service implications that restricts personnel from deployment but can be used in the non-deployed setting [5].

Conclusion: In summary, psoriasis is a common inflammatory skin condition with first peak onset during military deployment. It can cause discomfort while wearing military gear, which can put soldiers at risk. Topical steroids, steroid sparing agents and apremilast may be used during deployment. Other treatment is available in the non-deployed setting.

References: