Atopic Dermatitis in the US Military

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PRACTICE **POINTS**

- The US Military follows strict medical eligibility requirements for enlistment and retention. Atopic dermatitis (AD) and chronic eczematous conditions after 12 years of age is disqualifying for military service, but waivers may be possible for mild cases.
- Unpredictable and rigorous environmental and occupational stressors associated with military service as well as limited access to medical care make AD a challenging condition to manage for service members, particularly during military deployment.
- Accurate diagnosis and documentation of AD in childhood and adolescence by nonmilitary providers are essential, as they will aid in appropriately determining an applicant's potential to successfully serve in the military.
- For current service members, nonmilitary providers play a vital role in diagnosis and management where military dermatologists are not readily available.

Nonmilitary providers play a critical role in the diagnosis and management of atopic dermatitis (AD) in children and adolescents who may one day desire to join military service as well as current military members who do not have access to military dermatologists. Failure to diagnose or incorrect diagnosis of AD in a child, adolescent, or current service member may have negative implications on their ability to effectively and safely serve in the US Military.

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Dermatologic conditions historically have affected military members' ability to serve during times of peace and conflict. These conditions range from chronic dermatologic diseases to environment- or occupation-related dermatologic diseases. Mild to moderate atopic dermatitis (AD) typically is a manageable skin condition. However, in a deployed setting, a flare of AD can result in the inability of a member to perform their military duty, which directly compromises mission safety and effectiveness. The military developed and updates medical standards for entry and retention of service members. These standards are designed to ensure the greatest potential for a military member to successfully serve at home station and during combat operations.

Impact of Injuries in Military

Historically, disease and nonbattle injuries have resulted in notably more hospitalizations and time lost than injuries sustained on the battlefield.[1] A review of major conflicts dating from World War II shows approximately 10% of all dermatologic concerns were related to eczematous dermatitis, with 2% specifically related to AD. These numbers varied remarkably depending on the location and environment of the conflict, with eczema accounting for 25% of dermatologic concerns during the Gulf War.[2] During the initial phases of Operation Iraqi Freedom, approximately 75% of hospitalizations were from disease and nonbattle injuries, of which dermatologic disease accounted for 3%.[1] From 2003 to 2006 in Iraq, 35 service members were evacuated from combat zones specifically for uncontrolled AD.[3] In a deployed environment, each member is critical to the unit's success in completing their mission. A single member of a unit often is the only person qualified to perform a function for that team. There are rarely extra people with similar skills to replace a member unable to complete his/her duties. The loss of a single member compromises the effectiveness and safety of the team and can lead to mission failure. Therefore, AD can have a profound impact on military operations in a deployed environment.

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Military Medical Standards for Accession and Retention

There are 2 main goals of the military medical standards. First, the individual health of the applicant or military member is of utmost importance. Applicants with medical conditions that will be exacerbated by military service or that limit the ability for successful military operations are not accepted for military service. Once an active-duty member is diagnosed with a medical condition, the military determines if limitations are needed for military assignments and deployments based on available medical care in those locations. Second, mission accomplishment in combat operations requires that healthy military members are able to complete their jobs in extreme environments and under notable stress. If an applicant has a medical condition unsuitable for military service, it is in the best interest of the applicant and the military to deny entry.

The *Medical Standards for Appointment, Enlistment, or Induction Into the Military Services (DoD Instruction 6130.03*) lists conditions that are disqualifying for military service.[4] Section 5.21 lists the following as disqualifying for military service in relation to eczematous dermatitis:

> d. History of AD or eczema after the 12th birthday. History of residual or recurrent lesions in characteristic areas (face, neck, antecubital or popliteal fossae, occasionally wrists and hands).
> e. History of recurrent or chronic non-specific dermatitis within the past 2 years to include contact (irritant or allergic) or dyshidrotic dermatitis requiring more than treatment with topical corticosteroid.[4]

Although cases of incorrect diagnosis or very mild AD can be considered for a waiver, the process can be laborious and consideration or approval is not guaranteed. For current military members with new chronic eczematous dermatitis, each service has a process for evaluation and treatment. Some special operational jobs, such as aircrew, missile operators, and divers, have more restrictive medical requirements that are monitored by physicians with special training in these populations.

Atopic dermatitis affects 25% of children and 2% to 3% of adults.[5] Approximately 60% of patients with AD will develop their first eruption by 1 year of age, and 90% by 5 years of age. Although the majority of patients will have resolution of their disease during childhood, 10% to 30% will have persistent disease into adulthood.[5] Because the majority of AD resolves in childhood, it is understandable that asymptomatic individuals with a history of AD before 12 years of age meet military entrance medical standards.

Provoking Factors

The US Military maintains stringent medical standards because of the nature of the dynamic, rapidly changing military environment and its demands. Whether training for readiness in an austere location, deploying to extreme climates, or being stationed overseas, service members must be prepared to encounter a myriad of environmental extremes, physical stress, and psychological stressors. Environmental factors commonly experienced in the military can provoke or exacerbate symptoms of AD (Figures 1 and 2). Ideally, an individual with AD lives in a stable climate, has access to moisturizers and topical steroids, bathes regularly to remove dust and debris, wears 100% cotton garments to avoid irritation, and avoids using gear that would cause exacerbations. Service members rarely have such accommodations in deployed settings. A recent article in *Military Medicine* explained quite well, "If someone wanted to design an experience with the explicit goal to flare a person with otherwise well controlled atopic dermatitis it would probably look like a military deployment."[3]

FIGURE 1. US Marine Corps Forces participate in Exercise White Claymore in Malselvfossen, Norway, whereby the US Marines improve their over-the-snow movement skills in the harsh arctic climate. Photograph by Menelik Collins.

FIGURE 2. US Marine Corps training area in Bellows, Hawaii, whereby US Marines insert themselves into a jungle environment defense scenario. Photograph by Jacob Wilson.

The United States has a military presence in countries with extreme temperature and humidity variations all over the world. Uniforms are standardized, and members are required to wear prescribed clothing with no alternatives. Uniforms are made of durable sturdy material. If uniforms can be laundered, they often are grouped together, and sensitive detergent cannot be specified. Bathing is challenging in deployed locations, with troops often going weeks using baby wipes for self-hygiene. These conditions increase risk for development of contact allergens, and little access to proper hygiene practices also increases risk for secondary infections in members with AD.

In addition to environmental challenges, the military gear and equipment used can flare AD. Service members must wear protective gear such as body armor. These heavy hard pieces of material are bulky; difficult to wash; and cause friction, sweating, and irritation. The military prepares for operations in chemical, biological, radiological, or nuclear environments, which requires wearing a rubber mask, multiple layers of boots and gloves, and thick charcoal impregnated over garments for many hours. Such conditions may flare AD or make it intolerable.

Although stress is a part of any deployment experience, excessive or prolonged stress can lead to combat operational stress reactions that inhibit a service member's ability to function.[6] Stressors during deployment can accumulate and may be caused by the operational environment, loss of fellow service members to injury or death, illness, leadership demands, personal choices, issues on the home front, interpersonal conflicts, and sleep loss.[7] Atopic dermatitis can be exacerbated by such stress, leading to increased pruritus and scratching.[7-9] Symptomatic AD also can play a role in worsening combat stress. Although severe pruritus may affect attentiveness to job duties during the day, these symptoms, if uncontrolled, also can negatively affect sleep. As many as 60% of patients with AD at baseline and 83% of patients with exacerbations experience sleep disturbance due to their disease.[5] These stressors experienced by deployed military personnel can contribute to combat stress reactions, which may vary from simple inattentiveness to more serious behaviors such as suicidal ideation.[6] Combat stress reactions inhibit a military member's ability to function properly in the deployed environment and can lead to notable safety concerns and potential mission failure.

Vaccinations

Military members deploying overseas are required to receive specific vaccinations, including the smallpox vaccine. Although the virus was eradicated in 1980, the concern for smallpox to be used as a biological weapon in certain areas of the world necessitates continued vaccination of military populations. According to the Centers for Disease Control and Prevention, the only known reservoir for the virus is humans, and the disease has a mortality rate of 30%.[10] A history of or present AD is a contraindication for primary smallpox vaccination and revaccination for nonemergency use because of the risk for eczema vaccinatum.[11] The risk also applies to close contacts of vaccinated members. For 30 days after vaccination, service members must avoid skin-to-skin contact with anyone who has active AD.[12] Eczema vaccinatum in vaccinated individuals is typically self-limited; however, eczema vaccinatum in nonvaccinated contacts can be severe. One case report described a 28-month-old child with refractory AD who developed severe eczema vaccinatum after contact with her recently vaccinated military parent. The child required a 48-day admission to the intensive care unit and multiple skin grafts; fortunately, the child did not develop any apparent long-term sequelae.[13] This case highlights the importance of understanding the risks associated with smallpox vaccination in military members

with AD and the responsibility of health care providers to properly screen and counsel individuals prior to administering smallpox vaccines.

Treatment

Treatment of mild to moderate AD is relatively straightforward in developed countries with good access to medical care. The most recent American Academy of Dermatology clinical guidelines for AD focus on minimizing irritants and triggers, regularly using moisturizers soon after bathing, and using topical steroids as needed.[5] Military members face specific challenges regarding treatment of AD, particularly when deployed to remote locations without access to treatment facilities or medications. Military members are required to carry all necessary personal medications with them for at least 6 months and preferably the duration of the deployment, sometimes up to 1 year. Military members carry a large amount of gear for deployments, and it is not feasible to pack an additional 10 to 20 lb worth of emollients and topical steroids to last the entire deployment. Routine laboratory monitoring is limited or completely unavailable. Refrigeration typically is not available, making use of systemic medications nearly impossible during deployments. In the event of complications such as eczema herpeticum or secondary bacterial infection, service members could require evacuation from the deployed location to a larger field hospital or to the United States, which is costly and also removes a valuable team member from the deployed unit. These limitations in access to care, medications, and treatment options make AD a difficult condition to treat in the deployed setting.

Nonmilitary Medical Providers

Civilian providers play an important role in diagnosing and treating AD. It is vital to completely and accurately document treatment of all skin diseases; however, it is especially important for those who desire to or currently serve in the military. Military primary care providers or military dermatologists must review the information from civilian providers to aid in determining suitability for entry or retention in the military. Clearly documenting the morphology, extent of disease involvement (eg, body surface area), treatment plan, response to treatment, and exacerbating factors will aid in ensuring the patient's medical record accurately reflects their skin disease. Ultimately, this record often is the only information available to make health determinations regarding military service.

Conclusion

A career in the military is challenging and rewarding for those who volunteer to serve. Because of the demanding and unpredictable lifestyle inherent with military service, the Department of Defense maintains strict medical standards for entrance and retention. These standards ensure members are capable of safely completing training and deploying anywhere in the world. Although AD is a relatively common and treatable skin disease in locations with well-established medical care, it can pose a notable problem for service members while deployed to austere locations with variable environments around the world. Environmental factors and gear requirements, coupled with limited access to treatment facilities and medications, render AD a potentially serious issue. Atopic dermatitis in military members can affect individual medical readiness and unit success. It is important that all providers understand the myriad effects that AD can have on an individual who wishes to join or continue service in the military.

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