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Dermatoses among athletes

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Abstract

Introduction: Dermatoses are a common problem among athletes due to exposure to various chemical substances, close skin contact with other individuals and higher risk of abrasions and skin trauma. Dermatoses affecting athletes may be divided to inflammatory, infectious and mechanical dermatoses. Due to various presentations, athletes should not neglect any lesions on their skin and should seek medical help. Physicians must remember about thorough examination including skin, to check if athletes can exercise and participate in sport events.

Purpose of work: The aim of this article is to emphasize the association between dermatoses and sport activities, including the necessity of their proper diagnosis and treatment.

Materials and methods: Articles in Pubmed database were researched using following keywords: dermatoses among athletes, sport dermatoses, infections among athletes, exercise-induced anaphylaxis.

Conclusions: Skin diseases may affect athletes' performance and require them to cease professional training and close contact with other athletes. Physicians must remember the necessity of an accurate diagnosis and prompt initiation of the treatment to avoid delay in practice, team training and competitions.

Keywords: dermatoses, athletes, sports dermatology, contact sports

Introduction

Dermatological diseases are commonly associated with exercising. They can be divided into some sections, such as inflammatory diseases, infectious or mechanical. Inflammatory conditions include contact dermatitis, urticaria, exercise-induced anaphylaxis. Infectious ones - tinea pedis, impetigo, folliculitis and herpes simplex infection. Mechanical disorders involve talon noir, as well as blisters. [1]

It is crucial to perform proper examination of the athletes by physicians before participation in competitions to be certain about their good health condition and ability to get involved in sport activities. Doctors are required to perform physical examination of athletes including skin condition as well as cardiovascular, neurological or pulmonary system. It is necessary to thoroughly diagnose each athlete. [2] Infectious diseases are commonly diagnosed among athletes involved in contact sports due to higher possibility of transmission when close skin – to – skin contact occurs. Abrasions and cuts on the skin may facilitate the spreading of infections. Sharing and not cleaning equipment, and a warm environment also enable transmission. Prompt diagnosis allows athletes to get proper treatment and return to exercising without risk of disease transmission to their teammates and competitors. [1,3,4]

This article focuses on the main skin disorders among athletes, their etiology, characteristics and management.

Tinea pedis

Tinea pedis is a superficial fungal infection affecting feet, typically caused by two dermatophytes: *Trichophyton rubrum* and *Trichophyton interdigitale*.[5,6]

Sweating, excessive exposure to water, occlusive footwear (creating warm and wet environment), sharing bathrooms, showers and pools are some of various factors predisposing to fungal transmission. The infection is also called athlete's feet due to its high prevalence among exercising individuals. Swimmers are more prone to infection due to long exposure to water as well as walking barefoot by swimming pools and in locker rooms. Wearing occlusive shoes for prolonged time also contributes to dermophytes growth by footballers.[5,6]

There are three main types of tinea pedis: hyperkeratotic tinea pedis, interdigital tinea pedis and vesiculobullous tinea pedis. Hyperkeratotic form is associated with wearing moccasins and presents with scaling, hyperkeratosis and erythema localized on the parts of foot covered by moccasin – mostly plantar surface of the foot, both sides and distal part of dorsum. It is mostly asymptomatic. Interdigital form localized in the web spaces is characterized with maceration, scaling, peeling and erythema. It comes along with pruritus in the contrary to hyperkeratotic form. Fissures accompanied by pain may also be presented. Vesiculobullous type localizes on the soles of the feet and is characterized by vesicles and erythema. Development of those lesions is quicker than in the two previous forms.[6]

Occult tinea pedis is an asymptomatic form of this infection, commonly occurring among athletes. Dermatophyte is present on the skin, but carriers do not have symptoms. Noteworthy is the fact that the lesions may appear due to suppression of the immune system. [7,8]

Most of the dermatophyte infections are treated with topical antifungal medications such as allylamines, azoles, amorolfine or benzylamine. If the response is not adequate, systemic drugs should be administered: terbinafine, fluconazole or itraconazole. They are used when the infection is intense, chronic or repetitive. Systemic antifungal drugs may lead to various adverse events including hepatotoxicity, gastrointestinal upsets (nausea, vomiting, diarrhoea), headache and a lot of more. In account of them, patients should get such information from their physicians to be prepared for their occurrence.[1,5,6]

If tinea pedis is not properly managed, it may result in secondary bacterial infections which requires antibiotics administration – topical or systemic. Hyperkeratotic forms of tinea pedis

are recommended to be also treated with urea or salicylic acid. Keratolytic agents reduce the plaques and thickness which intensifies effects of antifungal medications. [5,6]

Improvement of hygiene in locker rooms and swimming pool facilities is essential to manage the transmission of fungal infection among athletes.

To prevent recurrent episodes of infection athletes should remember about thorough washing of their feet and to maintain dryness of them, especially after showering. Individuals wearing occlusive shoes for prolonged time may also use antifungal powder inside them. A moisture – wicking fabric of socks may be also useful in maintaining dryness. Athletes should be advised not to share their clothes, shoes and towels. Swimmers and divers must avoid walking barefoot by the swimming pools and in changing rooms. Diabetes and immunodeficiency contribute to higher risk of developing dermatophyte infection and to recurrences.[5,6]

Impetigo

Impetigo is a superficial bacterial infection caused by *Streptococcus* and *Staphylococcus* species. It may be transmitted by close skin – to - skin contact or through skin abrasions. [3] It is presented with vesicles, papules, plaques or honey-coloured crusts usually found on the neck, head and extremities [1,9]. Diagnosis is based on physical examination and interview. Most cases of impetigo can be treated with topical mupirocin, although severe cases requires oral antibiotics administration.[3]

To avoid an infection, athletes are supposed to restrain from contact with contagious people and they are also recommended not to share equipment and garment. To prevent infection of open wounds, they must be properly managed.[3]

Folliculitis

Inflammation and infection involving hair follicles is called folliculitis and presents mostly with pustules and papules. Folliculitis is mostly caused by Staphylococcus and Pseudomonas and develops in occluded, covered areas. Pseudomonas infection can be a result of inadequately cleaned bathtubs or whirlpools and may develop on the skin occluded under the bathing suit. Treatment consists of topical or systemic medications containing antibiotics. As a prevention, bath tubs should be thoroughly cleaned and athletes are not recommended to share their equipment. [3,9]

Herpes simplex infection

Herpes simplex is a virus causing vesicular lesions on the skin. It is commonly transmitted by skin - to - skin contact. There are two types of HSV: HSV -1 and HSV – 2 that are responsible for infections in the human population. Group of athletes at high risk of infection are wrestlers due to the intense skin contact among competitors, however HSV-1 infection may occur among professionals in other disciplines where skin – to – skin contact is present, including rugby players and boxers [10].

HSV-infection, specifically affecting wrestlers is called herpes gladiatorum. It is mostly caused by HSV – 1 type of virus and is transmitted to the competitors as well as to the teammates. Spreading the infection by contact with mats is less probable than the skin contact transmission. [11] Primary herpes gladiatorum infection presents with groups of vesicles on an erythematous skin, localized most frequently on head and neck, then extremities and trunk. Vesicles evolve to erosions and ulcerations and eventually they heal and may be preceded by tingling or tenderness of the affected areas. [10] Some athletes may present also symptoms such as: headache, malaise, elevated body temperature or lymphadenopathy.

Recurrent outbreaks are milder and characterized by fewer vesicles and shorter duration. Stress, fatigue, trauma, sunlight, hyperthermia and some drugs are factors contributing to recurrence of infection.[12] Athletes in higher risk of developing recurrent infections are those who are exposed to intense sunlight, like skiers or cyclists. [12,13]

To limit the spread of herpes simples skin infection athletes are recommended to avoid skin – to – skin contact with other participants. In wrestling there is a higher risk of abrasions which allows viruses to transmit more easily and wrestlers are more prone to get infected. [13] Despite of absence of lesions on skin, athletes can be contagious if reactivation is asymptomatic. Some studies indicate that valacyclovir can be used as a prophylaxis of herpes gladiatorum outbreaks. [14]

Treatment consists of oral antivirals, mostly acyclovir and valacyclovir. It should be emphasized that misdiagnosis is common and delays proper management of skin lesions what may lead to further transmission to other athletes.[10]

Contact dermatitis

An inflammatory disease called contact dermatitis is caused by skin contact with various substances. Contact dermatitis is divided into allergic contact dermatitis and irritant contact dermatitis. Irritant contact dermatitis can be a result of direct contact with substances damaging and irritating skin. It happens more often in case of longer duration of contact, larger amount of substances and the mechanical trauma of the skin. Allergic contact dermatitis is a hypersensitivity reaction caused by specific allergen. In the acute phase there are oedema, erythema, itching, then it can lead to erosions, crusts, scaling and in the chronic phase there is lithenification. [2,15]

Contact dermatitis is common among athletes as a result of intense sweating, friction and substances used to produce sport equipment like in sailing, fishing, shoes in running, abrasive surfaces of balls used in baseball or basketball, gloves in hockey. In water sports, contact dermatitis results from equipment like goggles containing neoprene or rubber, swimwear, nose clips as well as substances disinfecting water in swimming pools. [16] Professionals can be also affected by a specific condition localized on palms and fingers, called ‘canyoning hands’. It is a result of cold water and rock activities during canyoning. [17]

To limit the occurrence of this condition, avoiding contact with irritating substances is crucial. As a topical treatment corticosteroids and calcineurin inhibitors are used. Oral steroids can be considered if topical agents does not manage the symptoms. [16] Systemic immunosuppressive agents such as cyclosporine and methotrexate are recommended only in severe cases. To hydrate skin, patients are recommended to use topical emollients. [15]

Urticaria

Urticaria is an inflammatory dermatosis, characterised by wheals in different sizes as well as angioedema, accompanied by pruritus. Depending on the time duration of the disease, two types of urticaria are distinguished: acute, lasting less than six weeks, and chronic, lasting more than 6 weeks. The last one is spontaneous or inducible by various factors.[18] Some types of inducible chronic urticaria are more likely to afflict athletes, including cold urticaria, solar urticaria or cholinergic urticaria. Cold urticaria occurs due to exposure to low temperatures, for example in winter sports, or to cold water. On the other hand, solar urticaria wheals appear after exposure to sun and localize in uncovered areas. [19] Cholinergic urticaria is induced by elevated body temperature and sweating which often happens during exercising. Wheals appear in a short time after beginning of exercising and sweating. It occurs more often among young women. [3,19] Wheals usually localize on the neck and trunk, but they can

spread to other body parts.[20] They resolve in about 24 hours, usually after the end of the exposure to the triggering factor. [1]

Management of urticaria includes systemic medications like antihistamines, corticosteroids, immunosuppressant such as cyclosporine or methotrexate and leukotriene antagonists or omalizumab (anti-IgE antibody). The best way of managing wheals is identification of exacerbating factors and then its avoidance. [18]

Exercise-induced anaphylaxis

Exercise-induced anaphylaxis is a disorder occurring sporadically after exercising. Symptoms are similar to those in anaphylaxis induced by other factors. It firstly presents with pruritus, erythema and wheals, which are often larger than in cholinergic urticaria. Then it may progress to angioedema, bronchospastic symptoms, sudden fatigue and gastrointestinal symptoms including diarrhoea, nausea, vomiting. In most severe cases it can lead to collapse. The cessation of activity after first symptoms should prevent their progression. Some factors may trigger the exercise-induced anaphylaxis including exposure to high or really low temperatures, alcohol or some food and drugs. [20-22]. The similar disorder called food-dependent exercise-induced anaphylaxis happens to individuals who exercise after eating specific food. Grains, mostly wheat, are substances frequently leading to elicit the episode. [21] Athletes should avoid eating food containing allergens for 4 hours before exercising to reduce the possibility of this type of anaphylaxis. [21,22]

Treatment of exercise-induced and food-dependent exercise-induced anaphylaxis is similar to other types of anaphylaxis and contains intramuscular epinephrine, antihistamines, beta-agonists, fluids and corticosteroids. Physicians should recommend patients to avoid co-triggers and discontinue the activity after first symptoms in order to prevent occurrence of anaphylaxis or progression of the episode. It should be emphasized that patients should be educated about the epinephrine use if no reduction of the symptoms is present. The proper management of comorbid allergic diseases is also important to reduce the chance of anaphylaxis. [2,21] Intake of cromolyn sodium before meals [21] and sodium bicarbonate before exercising might be considered as potential management preventing the anaphylactic reaction.[20]

Talon noir

Talon noir is a condition characterized by dark pigmentation on the posterolateral surface of the heel. It results from a haemorrhage, due to insufficient protection of blood vessels by fat tissue. This condition predominantly affect athletes requiring many repeated starts and prompt stops. which is frequent in football, basketball, tennis, but can also occur in other sports. It is mostly found in young athletes. Although it may be mistaken for melanoma, talon noir is asymptomatic and typically resolves spontaneously within a few weeks, requiring no therapeutic intervention.[23,24]

Friction Blisters

Friction blisters are a result of various frictional forces involving one skin area. These frictional forces cause intraepidermal splits that fill with fluid which is similar to plasma. [2,3] Blisters are common among almost all athletes including ultramarathon runners and adventure racers, soldiers, hikers, backpackers, military personnel and individuals who are active. [25-28]

Blisters are often regarded as a minor injury, but they can cause pain, secondary bacterial infections and have negative effect on the performance. [25] Friction blisters affect mostly feet and hands.[1] Epidermolysis bullosa simplex, aplastic anemia or infections are some of the blisters' complications.[29] This is why it is important to identify potential factors that cause them. Occlusive shoes and gloves lead to damp and hot environment which substantially increase incidence of blister development due to change in skin barrier. [2]

Blisters can be prevented by focusing on decreasing friction and a less humid environment. Double blind study conducted by Herring and Richie showed that acrylic socks significantly reduced occurrence of blisters in comparison to cotton socks. Runners who used acrylic socks developed much smaller lesions.[29] Usage of drying powders, absorbent socks, petrolatum jelly and well fitted shoes are found as factors decreasing a risk of blister incidence. Anticholinergic medications, injections of botulinum toxin or iontophoresis can reduce perspiration which can help individuals with excessive sweating which is a contributing factor to blisters.[2,30]

Treatment of friction blisters consists of sterile incision and drainage. A roof of blister should be left intact serving as natural dressing.[2] Antibiotic medications are very rarely necessary. [1,30]

Conclusions

Skin diseases are prevalent among individuals all over the world, but they especially afflict athletes due to close skin – to – skin contact, exposure to various irritating substances or extreme temperature values. Intense sweating, sharing equipment and higher risk of abrasions may also contribute to various dermatoses. Physicians should be aware of the frequency of skin conditions among athletes and remember about the necessity of thorough examination performed on athletes. Proper diagnosis leads to prompt initiation of effective treatment which limits the disease progression and prevents spreading it to other individuals. Athletes usually may return to their training shortly after treatment, but should remember about essential preventive measures to avoid possible recurrent episodes of those diseases.

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