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Stress does hurt skin: Stress and atopic dermatitis

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Abstract

Atopic dermatitis is a chronic pruritic inflammatory skin disease with increasing incidence characterized by eczematous inflammation of the skin, a chronically relapsing course and severe pruritus [5]. The major causes of atopic dermatitis remain unknown [6-10]. The clinical manifestations seem to depend on a complex interplay between genetical, constitutional and environmental factors. Stress seems to be an important trigger for atopic dermatitis also being involved in the aggravation and maintenance of the disease.

Keywords: Atopic dermatitis, hypothalamus-pituitary-adrenal axis, stress, inflammation

Introduction

Atopic dermatitis (AD), also known as atopic eczema, is a long term type of inflammation of the skin. It results in itchy, red, swollen and cracked skin [11]. While the condition may occur at any age, it starts in childhood with changing severity over the years [11-12]. As children get older, the areas on the insides of the knees and elbows are most commonly affected. In adults, the hands and feet are most commonly affected [12]. Many people with AD develop hay fever or asthma [11].



Fig 2.

Clinical features of atopic dermatitis

The primary symptom of AD is dry, itchy skin that often turns into a red rash. The main symptoms of AD are dry skin, papules, lichenification, eczematous inflammation and an intense itching which is considered as a hallmark of AD. The pruritus is assumed to be central event in the maintenance and exacerbation of AD, triggering a vicious cycle of itching, scratching and aggravation of eczematous lesions [2, 3]. AD presents different symptoms depending on a person's age.

Symptoms in infants can include:

- Dry, itchy, scaly skin
- A rash on the scalp or cheeks
- A rash that may bubble and weep clear fluid. Children and adults usually have:
- Very itchy, red rashes on the back of the neck and knees and in elbow creases.
- On scratching, skin becomes thick, dark and scarred.
- Itchiness usually worse at night.
- Scratching can also lead to infection.

Causes of atopic dermatitis

The cause of AD is not known, although there is some evidence of genetic, environmental and immunological factors [13].

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Environmental factors

- Cold, dry weather
- Sweat
- Soaps, detergents and cosmetics
- Heat
- Wool and synthetic fibers
- Physical irritants – dirt, sand, smoke
- Allergens – pollen, dander, dust

Genetic factors

A number of genes have been associated with eczema, one of which is filaggrin. Genome-wide studies found three new genetic variants associated with eczema: OVOL1, ACTL9 and IL4-KIF3A.

AD occurs about three times more frequently in celiac disease, potentially indicating a genetic link between the two conditions.

Immunological factors

In atopic patients, a first contact with environmental allergens such as food allergens, contact allergens or inhalant allergens results in activation of allergen specific B-cells followed by profound secretion of IgE and will trigger the release of vasoactive mediators which are stored in the granules of the cells. These substances are responsible for the clinical manifestations of AD such as redness of the skin, erythema and itching [4].

Psychological factors

A distinct personality profile as well as elevated stress levels may increase the organism's vulnerability to AD and/or exacerbate AD symptoms [1].

How stress can trigger atopic dermatitis?

Most of the people experience a degree of stress as part of their daily life. In isolation, mild forms of stress have little impact on the body. However, frequent or chronic exposure to stress can trigger adverse side effects. While often thought of as psychological, stress has physical manifestations as well. One of the places where stress may have an impact is on a person's skin.

During inflammatory responses, the body-particularly the skin communicates with the brain through various sensations, such as pain, heat, itch and discomfort. These sensations can ultimately result in feelings of anxiety and depression, and can cause tired and foggy thinking.

Controlling symptoms of AD flared by psychological stress may relieve symptoms of anxiety and depression and improve emotional well being [14, 15].

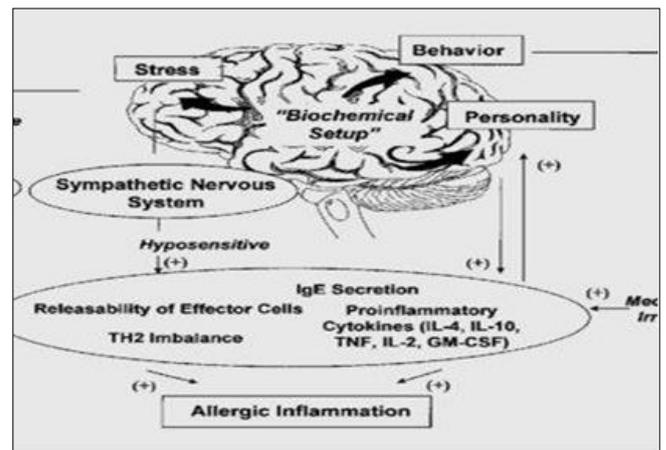
The link between psychological stress and atopic dermatitis is multifaceted. When we experience stress, there is activation of the HPA axis, a network involving the hypothalamus, pituitary gland and adrenal glands, which produce hormones. The HPA axis increases the amount of cortisol – a “stress hormone” – circulating in the body.

A psychoendocrine-immunological pathway of stress effects on AD

There are several possible pathways which can influence or increase allergic inflammation in AD. In response to psychosocial stress atopy-relevant immune processes like IgE secretion, TH1/TH2 cell balance, recruitment and activation of effector cells or cytokine secretion are regulated via activation of neuroendocrine systems like the

SNS or the HPA axis. A reduced responsiveness of the HPA axis and/or an attenuated sensitivity of β -adrenergic receptors may end in an adequate signal at the immunological target cell, resulting in aberrant immune responses (i.e. elevation of IgE secretions and proinflammatory mediators) and exacerbation of allergic inflammation [5].

Psychosocial stress may further attenuate the itch threshold, leading to increased scratching and mechanical irritation of the skin. Proinflammatory cytokines released by mechanical stimulation may trigger inflammation and therefore the disease process. Distinct personality traits which can be partially the results of a genetically determined biochemical setup within the brain and/or the sequelae of a chronic disease could also be associated with distinct immunological dysfunctions and will exacerbate AD symptoms [5].



(Courtesy: Buske-Kirschbaum A. [5])

Fig 2: A psychoendocrine-immunological model of AD

Management of atopic dermatitis

General management

- Patients with atopic dermatitis should limit the exposure to environmental and chemical factors known to cause exacerbation such as wool or synthetic fibers, soaps and detergents, dust mites, pollen etc.
- Moisturize the skin– calming the skin reduces stress and helps in preventing excessive scratching that leads to skin infections.
- Wet dressings– wrapping the affected area with wet bandages help to control signs and symptoms within hours to days.
- Light therapy– The simplest form of light therapy (phototherapy) involves exposing your skin to controlled amounts of natural sunlight or artificial ultraviolet A(UVA) and ultraviolet B(UVB) rays.

How to manage stress?

- Mindful meditation and relaxation practices can help to reduce anxiety, depression and pain.
- Exercise is well known to relieve stress, is also a great way to reduce anxiety, ease depression and manage other negative emotions.
- Adequate sleep is necessary as lack of sleep can cause stress and worsen eczema symptoms.
- Distraction activities such as writing, painting, video games, listening music etc.
- Healthy and balanced diet.
- Positive social relationships are important for physical and mental well-being.

Homoeopathic management

Homoeopathy healing methods are based on stable laws and principles. Homoeopathy is a holistic approach to disease. It asserts that no disease is local without affecting the whole body. We are aware that every physical disharmony is accompanied by a change in the mental or emotional state and vice versa. As the disease affects the whole body, physically and mentally or emotionally, the full picture of the patient will be needed to match the homoeopathicity of a well-chosen remedy.

There are following homoeopathic medicines which are helpful in the treatment of atopic dermatitis:

1. **Arsenic album:** Skin is dry, rough and scaly. Itching and burning, worse from cold and scratching. The disposition is depressing, melancholic and indifferent. There is great anguish and mental restlessness with nightly aggravation.
2. **Calcarea carbonica:** It is useful remedy for moist, discharging eczema, particularly on the scalp and in young children. They are more emotional types and can develop anxiety and anguish with palpitations of heart. Apprehensive; worse towards evening. They have fear of misfortune, contagious diseases. Forgetful, confused and low-spirited.
3. **Graphites:** This is a very useful remedy for eczema which is crusty, moist, yellow and sticky; especially forming in the folds of joints such as elbows, knees and groin. Eczema of lids; eruption moist and fissured; lids red and margins covered with scales or crusts. The skin can become dry, cracked, red, itchy and painful. The patient feels miserably unhappy. There is dejection, sadness and profound melancholy with discouragement and much weeping.
4. **Lycopodium clavatum:** The skin is thick and indurated. Chronic eczema associated with urinary, gastric and hepatic disorders. Violent itching, worse warm applications. They have constant fear of breaking down under stress. They are apprehensive and melancholic, afraid to be alone. Symptoms run from right to left, acts specially on right side of the body.
5. **Natrum muriaticum:** Dry eruptions, especially on margins of hairy scalp and bends of joints. Eczema; raw, red and inflamed; worse by eating salt and at sea shore. Their symptoms come on after grief, shock or rejection such as in unrequited love; after which they tend to brood for a long time over their misfortune.
6. **Sepia:** Sepia is particularly helpful for long standing eczema affecting the nose, chin, behind the ears and the genitals with very dry skin. There may be a flareup during pregnancy or lactation if there are other stresses at the time, such as increased emotional demands. This is more commonly found in women where there is a tendency to exhaustion through overexerting themselves. They become listless and detached, even averse to own family members. They feel better for being occupied, or by vigorous exercises like dancing.
7. **Sulphur:** This is a great antipsoric remedy. Its action is centrifugal-from within outward- having an elective affinity for the skin, where it produces heat, burning and itching. The skin is dry and scaly. Itching and burning worse from scratching and washing. They are known as 'ragged philosophers'. He thinks himself in possession of beautiful things, everything looks pretty which the patient takes a fancy to; even rags seem beautiful, or

immensely wealthy. Very selfish, no regards for others. Sulphur subjects are nearly always irritable, depressed, thin and weak even with good appetite.

Conclusion

Stress is involved as a possible precipitating and aggravating factor in atopic dermatitis and disease itself can be a psychosocial stress, which maintains the disease. Emotional stress may result in increased itching and scratching behaviour. The remedy selected on the basis of totality of characteristic symptoms and through individualization which covers the patient's mental, physical and particular symptoms, has the capability to cure the patient at the deeper level which leads to permanent restoration of health.

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