

## Atopic dermatitis

New options in the differentiated search for causal factors and effective therapy

**The skin is bright red and scaly, ravaged by rashes and eczema and itches unbearably. For both adults and children, the regular flare-ups of atopic dermatitis are enough to make the skin crawl. Many patients also have allergies and asthma. They may also experience social rejection and feelings of inferiority because of their skin condition. The causes of atopic dermatitis are still not completely understood. This makes the search for causal factors in a specific individual the biggest challenge apart from the battle against itching and the impulse to scratch. New approaches offer a simplified and at the same time differentiated search for the causes related to food allergies. In combination with detailed analysis of the status of the gastrointestinal tract, assessment of vitamin and mineral levels and fortification of the immune system, the new approaches represent new options for a holistic therapy with long-lasting efficacy.**

Neuritis, genes or environment?

Atopic dermatitis is a relapsing chronic inflammatory reaction of the skin. In the 19<sup>th</sup> century the condition was given the name “neurodermitis”, based on the assumption that it was caused by an inflammation of the nerves. Today, the pathogenesis is considered to be multifactorial, specifically a combination of genetic predisposition and environmental factors (pollutants, nutrition, stress). The risk of a child suffering from atopic dermatitis is three times higher if the parents have the condition. There is definitive proof of a genetic disorder, which in some patients is responsible for dry skin: an enzyme defect prevents the transformation of linoleic acid to a constituent of the natural fat in the skin (gamma linolenic acid). The predisposition for atopic dermatitis is probably hereditary, but environmental factors appear largely to determine whether or not the disease breaks out and how severe the affliction is. Environmental factors such as stress and certain foods trigger relapses of atopic dermatitis again and again. The complexity of the symptoms and possible causes make a simplification of the search for causal factors and individual therapy highly desirable.



*Fig. 1: Pruritis is the main symptom of atopic dermatitis.*

## Everything itches!

The torment of pruritis (itching) is the primary symptom of atopic dermatitis. This sensation is above all due to the messenger substance histamine which is released by certain skin cells (mast cells). The trigger for histamine release is contact with a foreign and most often harmless substance (allergen) such as pollen, house dust or certain foods. Scratching causes the irritation of more skin cells, which again release histamine – the immune system goes into combat mode.

The extreme pruritis not only causes intensive scratching that results in external damage to the skin, but it is also an intensive psychological burden. Lack of sleep and the resultant emotionally unstable behavior, the emotional burden of an unattractive appearance, and withdrawal from social activities are common sequelae of atopic dermatitis (3).

## New diagnostic insights

Atopic dermatitis can be triggered by a variety of allergens, for example foods, wool, chemicals (detergents and cleaning agents), or animal fur. It can also be triggered by infections or temperature changes, as well as psychological factors such as anxiety and stress. Multiple factors are most probable, and this makes the search for the causes very difficult and tedious in many cases. Everyday experience of patients shows that foods frequently cause atopic dermatitis to flare up. However, finding out exactly which foods are the culprits is difficult.

It is known that food allergies mediated by IgE antibodies can cause or exacerbate the relapses of atopic dermatitis. In this type of allergy, histamine is released in the skin cells.

On the other hand, relatively new findings show that the delayed food allergies mediated by IgG antibodies are also capable of triggering relapses of atopic dermatitis. In these cases, the inflammatory reaction is started by soluble immune complexes.

It has recently become possible to differentiate between the two types of allergy by indirect means. Skin gels containing the enzyme DAO (diamine oxidase), which can break down histamine, have been shown to relieve the itching of IgE-mediated food allergies. It has also been found that skin gels containing silicon are able to reduce the IgG-mediated inflammatory reaction and thereby relieve the itching.



Dr. Paul is a molecular biologist who has written an interdisciplinary doctoral thesis on the technology assessment of predictive genetic diagnostic methods for tumor diseases. Specializing in “Evolution – Nutrition – Medicine”, she has presented numerous publications and lectures, in particular in the fields of molecular biology, gene technology and food allergies. Contact Tel. 06151 / 6668027

In practice, this allows a simple procedure with which to determine whether IgE and/or IgG-mediated reactions are causing the patient's symptoms. A gel containing DAO can be applied to one itchy patch of skin, and a silicon-based gel can be applied to another patch of itchy skin. A positive effect at the application site of one (and sometimes both) of the two gels within approximately 20 minutes indicates that IgE and/or IgG is probably responsible for the reaction. A therapist can then decide whether to test for an IgE or an IgG allergy to specific foods in connection with the atopic dermatitis.



Fig. 2: Simple means of differentiating the trigger factors of atopic dermatitis

This procedure has the advantage that it can point to a path for targeted diagnostic measures within a very short time and with minimal effort. If it is possible to determine which foods to avoid, the gels can be used furthermore as adjuvant skin care, for example in situations such as eating out at a restaurant where it is not always possible to know what ingredients are in the food. The appropriate skin gel can then be applied in the event of a relapse of atopic dermatitis.

### Immune system in combat mode

In atopic dermatitis, the immune system is in combat mode. What major systems of the body launch such a vigorous reaction? What factors trigger that mechanism again and again?

**The intestinal tract is a major immunological organ, and at the same time it is the largest. Many different factors are capable of disrupting the intestinal functions.**

**Food:** Some food ingredients cause allergic reactions. Food allergies of the delayed type in particular can result in chronic inflammatory reactions in the gastrointestinal tract. This, in turn, can lead to an increased permeability of the intestinal wall (so-called "leaky gut syndrome"). This goes most often hand in hand with a shift in the balance of intestinal flora which allows putrefactive bacteria and fungi to impair intestinal functions.

**Heavy metals:** Bacterial and fungal infections of the intestines are often induced by heavy metals. Disruption of absorption in the small intestine is the result in many cases. Heavy metals such as lead also impair kidney functions.

**Stress:** The enteric nervous system (vegetative nervous system of the digestive tract) is sensitive to stress, and it affects not only digestion but also the absorption capacity of the intestines. If intestinal function is impaired, this leads to vitamin and mineral deficiencies in many cases, also placing the liver and kidneys under strain.

The effects of reduced levels of vitamin B6 serve as an example. Vitamin B6 functions as a co-enzyme to diamine oxidase (DAO), which breaks down the inflammation mediator histamine. This means that a vitamin B6 deficiency impedes the breakdown of histamine. Higher concentrations of histamine in the body cause stronger and/or longer lasting inflammatory skin reactions. Vitamin B6 also influences the hormone ACTH (corticotropin), which regulates the body's production of glucocorticoids (cortisone). In summary:

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A reduced vitamin B6 level may also reduce the effectiveness of the body's natural inflammation inhibitor, cortisone.

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### Comprehensive analysis of causes and holistic therapy

It is thought that atopic dermatitis cannot be healed, but that it can be managed. Classic therapy according to guidelines of the German Dermatology Society (1) comprises symptom-oriented basic therapy to support skin functions, plus eczema treatment (products to relieve pruritis, antimicrobial products and products to preserve skin moisture), and above all anti-inflammatory drugs, which include corticosteroids (cortisone) and macrolides. Systemic therapy is based on antibiotics, antihistamines and virostatic drugs (and in exceptional cases also steroids and immunosuppressants). Adjunctive measures are recommended, such as phototherapy/climate therapy and psychosocial or psychosomatic counselling (including self-help groups).

For many patients, this classic approach is unsatisfactory, either due to lack of efficacy or due to the adverse reactions. Interestingly, the long-lasting success of atopic dermatitis treatment is often due to a combination of measures which improve the functional capacity of the intestines and organs which follow in the chain, such as the liver and kidneys, and due to measures which strengthen the immune system:

- Identification and avoidance of the foods that trigger allergies
- Regeneration of a healthy intestinal flora
- Detoxification therapy for the liver and kidneys (aiming at reduction of the heavy metal load)
- Local treatment to relieve itching and prevent inflammation
- Concomitant relaxation exercises (yoga, autogenic training, etc.) to reduce stress.

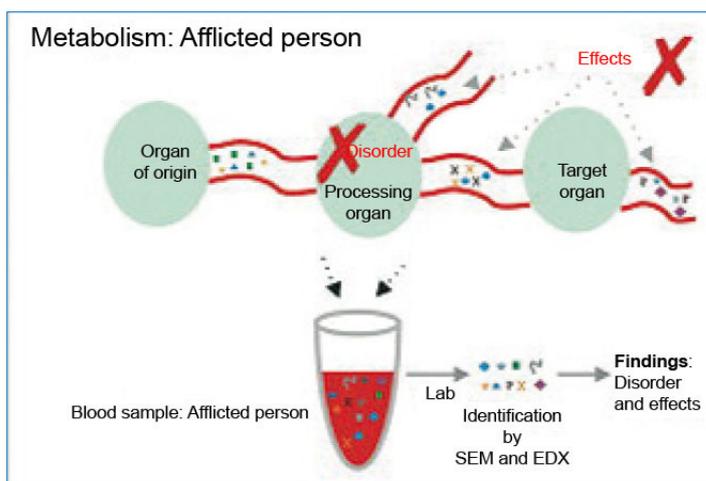


Fig. 3: Holistic analysis of metabolic changes

The success of such an approach has been documented as early as 1991 (4) and finds increasing use in medical practice.

An optimized treatment plan can now be generated with the help of a new metabolic function test based on nanoparticles. This procedure enables comprehensive detection of the tiniest metabolic changes and related problem areas in metabolic processes, for example in the intestines, liver, kidneys, immune system, and the vitamin and mineral balance (2). A comprehensive and targeted therapy can be developed on the basis of these findings (and with supplementary diagnostic examinations, if needed) along with the help of subject-related, in-depth medical literature.

## Conclusion

The availability of a new diagnostic method to examine food allergies in relation to atopic dermatitis, the metabolic function test with subsequent regeneration of the intestines, liver, kidneys, and the vitamin and mineral balance, and fortification of the immune system offer a new, simplified and at the same time holistic approach to the treatment of the causes of a atopic dermatitis.

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