



Allergies: When the Immune System Backfires

Video Transcript

Diagnosing allergic contact dermatitis

[Andreas J. Bircher]: In this video, we will have a closer look at the diagnosis of the different types of eczema. We distinguish three common subtypes. Allergic contact eczema, irritant contact eczema, and atopic dermatitis. These subtypes may differ in their appearance, localization, or in their mechanisms and causes.

In the diagnostic work-up, the patient's medical history, the onset and evolution of the eczema, and the contact with potential triggers are documented. Moreover, family history is relevant if atopic dermatitis is suspected. Known or suspected allergies, response to preventive measures, and the effect of previous therapies may be helpful as well.

The localization and distribution of the eczema might further help to correctly diagnose the eczema. Contact eczema are typically observed where the triggering substance acts. Allergic contact dermatitis may spread beyond the site and become widespread, or rarely generalised. Face and hands are most often involved, although the whole skin may be affected by a condition called erythroderma, or red skin.

Rarely, allergic contact dermatitis is caused by airborne exposure to volatile molecules, such as allergens from epoxy resins. Irritant dermatitis is most sharply restricted to the site of exposure. And finally, atopic dermatitis typically occurs in the face and at flexures.

We further distinguish between acute and chronic stages. Most eczema are associated with an intense pruritus. An irritant eczema may even cause burning sensations.

Acute eczema present with erythema, papules and vesicles, oozing, and erosions. Chronic eczema show erythema as well as thickened so-called lichenoid skin and large scales. This may lead to painful cracks and fissures close to the small joints.

The three subtypes might further be distinguished based on the different underlying mechanisms and their associated latencies. In irritant contact dermatitis, the initial damage happens at the skin barrier, resulting in an inflammatory response by the innate immune system. Here, a dose-dependent response is observed.

In allergic contact dermatitis, inflammation is mediated by T cells. In this process, T memory cells are crucial. Upon re-exposure, the reaction starts within six to 12 hours and reaches its maximum after one to three days. Finally, in atopic dermatitis, both IgE antibody and T cell-mediated inflammation play a role.

Epicutaneously applied patch tests are the major diagnostic tool in the identification of contact allergens. Basically, patch tests are provocation tests where the skin is both the affected organ and the test organ. The suspected allergens are applied on the intact skin, usually on the upper back, without pricking as in immediate-type allergy testing.



Application time is typically two days. Then the patch tests are removed and the reactions are read a first time. After another two to five days, a second reading is done.

If positive, allergen application causes a positive reaction, meaning a localised acute eczema with erythema, papules, and vesicles. The patch test reaction is scored according to the International Contact Dermatitis Research Group from negative to three plus. Weak allergic reactions, only presenting with erythema, and irritant reactions are sometimes difficult to distinguish.

The patch test can also be used to identify the culprits in some cutaneous drug hypersensitivity reactions. For irritant contact dermatitis, on the other hand, no such test exists, and patients are generally recommended to try to avoid the irritant as much as possible.