# Atopic eczema

**Atopic eczema** (atopic dermatitis) is a chronic relapsing itchy skin disease. As a result of the skin's lipid barrier damage, it comes up to an increased loss of water, dehydration and high dryness of the skin. This way skin becomes more sensitive to such factors as irritating agents and allergens, which continue to worsen atopic eczema.

It's a very frequent, episodic disease with swapping phases of exacerbation and remission, exceptionally the disease can be continuous. [1]

## Prevalence and prognosis

**15–30 %** of children and **2–10 %** suffer from atopic eczema. It occurs in men and in women with the same frequency. Almost 80 % of cases manifest in the first five years of life, and a high frequency of occurrence is already in the first year. Incidence of the atopic dermatitis is constantly rising. It has a relapsing progression with a tendency to continuous improvement in adulthood. Prognosis is worse in case the disease develops at a young age and with the occurrence of asthma bronchiale at the same time. [2][3][1]

## Etiology

It is a multifactorial disorder. Progression is affected by genetic factors, skin barrier defect, immune response, effects of the environment and infectious agents. No particular genetic reason was detected so far. Atopic eczema can be worsened by the provoking factors - irritative agents, allergens, microbes and climate, and hormonal and psychical factors. [1][4]

### Related factors

- diet change;
- emotional stress;
- contact with pets;
- contact with the irritating agents (irritants) – hot water, soaps, cigarette smoke, washing detergents with lots of enzymes, fresh juices (citrus, tomatoes, strawberries), clothes made of synthetic fibres (polyester), wool and fur;
- hormonal changes in women – in first and second trimester of pregnancy, peripartálního období (kolem porodu) a v menopauze; premenstruační exacerbace;
- aeroallergens – animal fur, roztoči, plísně a pyly;
- coldness and hotness;
- microorganisms – bacteria, viruses, molds, yeast;
- allergens – production of the IgE antibodies.[1]

#### Inhalant and food allergens

There are forms with and without coincident allergic sensibilisation. Allergic sensibilisation in atopic eczema increases the risk of the development of respiratory allergies. Contact with pets or house dust increases the risk of atopic eczema.[1] In most **grown-up patients** with atopic eczema the exacerbation of the disease is more often affected by inhalants than food allergens. However, inhalant allergies are closely related to response to the food allergens, which have a cross-reaction to the pollen - in pathophysiology, it means the cross-reactivity caused by the similar proteins contained both in food and in the pollen grain.

The most common food allergens in adults with atopic eczema are peanuts, eggs, wheat flour, soya and milk.


Video in English, definition, pathogenesis, signs, complications, treatment.

Risk products are possible to detect with the anamnesis, **skin prick tests**, serum specific IgE and atopic patch tests (non-IgE mediated hypersensitivity). Diagnosis is then confirmed by the remission after the **elimination diet** (elimination of the food product for 3-4 weeks) and the relapse in the **exposure test**. In patients with severe forms of atopic eczema is sometimes recommended a strict diagnostic hypoallergic diet which includes cooked vegetables (except celery) and cooked fruits, then rice, potatoes, corn and meat (except fish). The task is to ensure that after the dieting the skin state will improve.[4]

***Children*** with atopic eczema has stated the prevalence of food allergies in different stages ranges from 20 to 80 %. The most prevailing food allergens are eggs, cow milk, soy and wheat flour. In about 1/3 of children food allergy disappears after 1-2 years of the exclusion of the allergen, however, it depends on the type of the allergen.[4]

Earlier a „hypoallergenic diet„ used to be recommended for infants as the essential part of atopic eczema's prevention and treatment. In toddlers with atopic eczema, it used to be recommended to reduce and even completely exclude the products which cause the allergic reaction most often, for example, cocoa, chocolate, almonds, fish, poppy seeds, nuts, citrus, kiwi, tomatoes, celery, parsley, moldy cheese. Eggs used to be recommended only as a part of backed products and side dishes, not as a separate dish.[4][5][6][7][8]

According to the new recommendations, any restrictive (elimination) diet has to be indicated considering the results of the complex immune allergy investigation. Unjustified elimination of the products in children with mere sensibilisation has risks of malnutrition and deficiency of the antioxidants. Restrictive „low allergy“ diets without any stated allergy are not approved in evidence-based medicine. In the same way, the „low allergy“ diet is not indicated to mothers of breastfed babies. However, the diagnostic elimination diets make an exception - diet is evaluated after 2-4 weeks, if it has no effect, then there is no sense to continue dieting, in case of favourable effect it has to be confirmed by the further re-exposition. Children with a mild form of atopic eczema don't require any diet restrictions. In allergies with a clean diet, it is not necessary to eliminate the non-related products (for example in the allergy to cow milk protein the amino acid formula is indicated so there's no reason to eliminate dishes with eggs, gluten and so on).[9]

# Clinical picture

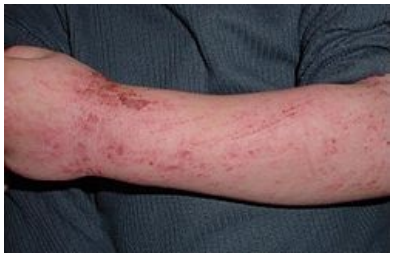
In diagnosis are used clinical signs, symptoms and anamnesis data. There are no laboratory or biological markers or specific histopathological pictures.[10]

**Main criteria:**

- itching (pruritus)
- typical manifestation in typical location – lichenification, roughen skin, erythema, vesicles, papules, peeling skin in predilection flexural locations: wrists, elbow and knee pits, face, neck, upper chest
- chronic or chronic relapsing skin inflammation
- positive personal or family anamnesis (including the occurrence of the hay fever and asthma)[10]

**Secondary criteria:**

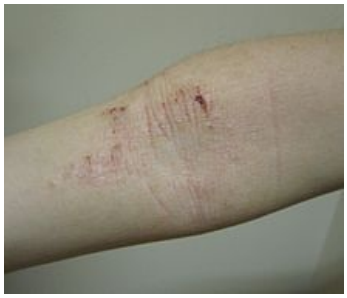
- early occurence of the disease
- increased level of the IgE in serum
- positive skin tests
- dermographismus albus
- cheilitis
- circles under the eyes
- unbearableness of wool clothing
- dry skin (xerosis)[10]



Atopic eczema in the forearm of the 5 years old child

Exacerbation (flare):

- increased dryness
- itching
- reddening
- edema
- general irritation.[1]



Atopic eczema in the elbow pit

Skin differences affected by atopic dermatitis:

- a lower level of **ceramides** – affects the protective function of the skin and the immune response;
- a lower level of the natural hydrating factor – increases the transepidermal water loss;
- microbial colonisation, mainly St. aureus – staphylococcus enterotoxins supports the inflammation of the skin; often without any clinical signs.[1]

For the evaluation of the severeness and range of atopic dermatitis there are different score systems, for example EASI, SCORAD.[11]

## Forms of the atopic dermatitis

### Infant phase (1. to 2. years of life)

The first manifestations occur in the first 2.–6. months of life in form of dry, rough skin, reddening or strongly itching papular to focal sowings, most often in areas of face, forehead, hair, around the ears and neck. It can spread to the whole head, body and extremities, at first rather over extensors. A bit later it affects the flexor surfaces of the limbs and tends to generalize. Fluctuation and sudden flare-ups are typical. As the result, a child

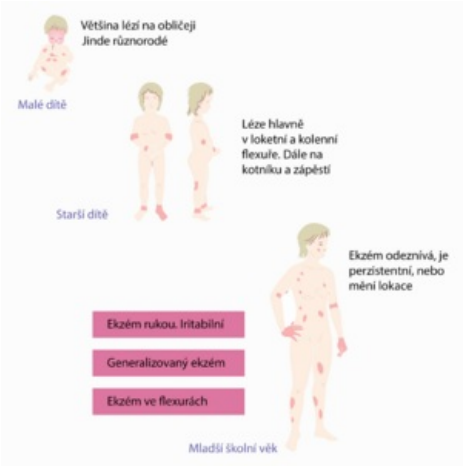
has insomnia, uneasiness and cries. The most common trigger factors are the food allergens, exacerbation is often triggered by the teeth eruption, vaccination or infection. Between the 9th and 12th month it's getting worse.[12][10][11]

**Child phase (2 to 12 years)**

Atopic eczema can be idiopathic or continues from the infant phase. About 2 years of life lesions in the elbow and popliteal pits start to dominate. Besides the neck, wrists and fingers can also be affected. The skin is coarse, rough, and erythematous with the first signs of lichenification. The typical look of the patient includes pale facial skin with darker and coarse eyelids. The external third of the eyebrows and sometimes the lashes are often missing. 75 % of children recover after this phase.[12][10][11]

**Adolescent and adult phase (above 12 years)**

After puberty, the intensity of atopic eczema goes down and the manifestations are more discreet. In addition, to the flexor surfaces hands, fingers, soles, cheeks, eye, lip and nipple areas also tend to be affected. Lichenification (skin roughening) dominates.[10]



Forms of the atopic dermatitis

# Complications

- infections, mostly staphylococcus and herpes;
- psychological problems – stress, feeling of the inferiority, low self-esteem, in case of severe itching - sleep disorders;
- eye complications – irritations of the conjunctiva, rarely a cataract or retinal detachment.[1]

# Treatment

A goal of the treatment is the reduction of the severe symptoms and prevention of the further manifestations, control over the course of the disease and improvement of the quality of the patient's life. The essence of the treatment is optimal skincare, regeneration of the skin barrier with emolencia and skin hydration. Besides it's also important to adjust the lifestyle (for example appropriate clothing and the right choice of cosmetic and hygiene products), diet, home environment, acquaintance with the factors which trigger the itching and their restriction. The most important is a detailed patient education.[11][1]

**Treatment of the mild forms (dry skin, occasional itching or reddening)**

- emoliencia and low potency local corticosteroids.

**Treatment of the moderate forms (dry skin, reddening, frequent itching, occasional excoriation)**

- emoliencia, medium potency local corticosteroids and local calcineurin inhibitors.

**Treatment of the severe forms (extensive areas of dry skin, constant itching and reddening, sometimes excoriation, weeping, cracked skin and changes in the pigmentation)**

- emoliencia, high potency local corticosteroids, local calcineurin inhibitors, wet compresses, phototherapy, also possibly a systemic therapy.[1][3]

## Emoliencia

- standard in treatment and prevention of atopic dermatitis, in total skincare;
- replacement of skin lipid loss, soften and hydrate the skin, renew the skin barrier and water capacity in the stratum corneum;
- increase the anti-inflammatory effect of local corticosteroids and decrease their consumption;[2][13]
- ointments and creams, emollient substitutes of soaps, bath oils - for daily treatment, washing or bathing;
  - hydrophilic creams and emulsions – they contain more water and have a higher cooling effect; the most appropriate are daily treatments, especially in warm climate conditions and in younger patients;
  - ointments and hydrophobic creams – grease better; they are more appropriate in more severe cases of skin dryness, in colder climate conditions, in older patients, primarily for legs and shoulders;
- adjuvant emoliencia – contain further components, for example, antiseptic and antipruritic;
- some preparations contain **hydrating substances**, which are used as components of the natural hydration factor – for example urea, glycerol, dexpanthenol;
  - furthermore, urea has a mild antipruritic effect, however, it can cause the irritation in some patients, primarily in infants and small children, that's why it's recommended for children older than 3 years;
  - glycerol changes lipid's pozměňuje behaviour in stratum corneum and reduces the transepidermal water loss, protects the skin barrier;
  - dexpanthenol has mild anti-inflammatory effects, positively affects the reparation of the skin barrier and healing of the superficial affections;
- **lipophilic components** renew the lipid lamellae and contribute to the skin hydrating by supporting the natural lipids in the stratum corneum and by ensuring better barrier function – for example vaseline, ceramides, cholesterol, free fatty acids (linoleic acid).[1]

## Local corticosteroids

- effective in situations associated with the inflammation, immune reaction and hyperproliferation, can provide symptomatic relief from burning and itching;
- there are 4 classes of efficiency:
  - low potency: hydrocortisone acetate, prednisolone,
  - moderate potency: hydrocortisone butyrate, dexamethasone acetate, triamcinolone acetonide, alclometasone dipropionate,
  - high potency: betamethasone dipropionate, betamethasone valerate, fluocinolone acetonide, mometasone furoate, methylprednisolone aceponate, fluticasone propionate,
  - very high potency: clobetasol propionate;
- are applied only on areas with active atopic dermatitis or areas with activity in the last 48 hours, usually once or twice a day;
- very strong topical corticosteroids should not be applied to the face, armpits, groin or occlusion;
- hydration of the skin, use of the occlusion and the nature of the vehicle affects the absorption and effect of the topical corticosteroids;
- side effects of long-term use of the high potency local corticosteroids are skin atrophy, stretch marks and telangiectasia;
- systemic side effects can occur when topical corticosteroids are applied on more than 30% of the body surface or in case of high potency local corticosteroid overuse.[14][1]

## Calcineurin inhibitors (topical immunomodulators)

- decrease the range, magnitude and manifestations of atopic dermatitis, reduce the itching;
- are not convenient in the treatment of a mild form of atopic dermatitis, not even in the first line of treatment of any form of atopic dermatitis;
- moderate the inflammation and don't have such side effects as local corticosteroids, that's why they're possible to apply in areas with thin skin (eyelids, face, intertriginous areas);
- one of the side effects is transient burning at the site of application, particularly in the first days of use;
- are possible to apply in acute and chronic cases of atopic dermatitis;
- do not apply on the skin with a current bacterial or viral infection, don't use the occlusion, avoid the UV radiation after the application;
- apply 2 weeks after vaccination to avoid its failure;[14]
- **local pimecrolimus** – is used in children older than 2 years as a second-choice drug in mild and moderate forms of eczema on the face and neck, where the treatment with the local corticosteroids is not effective enough and has a high risk of the side-effects, particularly the skin atrophy;
- **local tacrolimus** (0,03% for children older than 2 years, 0,1% older than 16 years) – is used in children older than 2 years as a second-choice drug in mild and moderate forms of eczema on the face and neck, where the treatment with the local corticosteroids is not effective enough and has a high risk of the side-effects, particularly the skin atrophy.[1]

## Preparations containing tar

- anti-itching and anti-inflammatory effects;
- are applied in chronic lesions of atopic dermatitis in monotherapy or in combination with local corticosteroids;
- side effects: folliculitis, photosensitivity;
- cons: bad smell, dark color of tar leaving stains on clothes.[1]

## Preparations containing ichthammol

- supports the regeneration of the keratinocytes, anti-inflammatory effect;
- to treat inflammation after stopping atopic dermatitis therapy; prevent the rebound phenomenon;
- minimal irritant, sensitizing and photosensitizing potential.[1]

## Further medications

- local antibiotics and antiseptics – for secondary bacterial infection treatment;
- peroral antihistamines – ineffective against itching;
- systemic corticosteroids and immunosuppressive drugs treatment (prednisolone, azathioprine and cyclosporine A) – for the short-term application in severe atopic dermatitis, when other possible alternatives have failed.[1]

## Phototherapy

- the application primarily in the chronic and subacute stages; narrowband ultraviolet radiation with wavelength 311 nm;
- in acute forms is prefered UVA1.[1]

## Spa treatment

- hydrogen sulfide mineral baths – antiseptic and anti-inflammatory effect.[1]

### Treatment of the red, wetting areas of the skin

- compresses with soothing and drying effect: for example Jarisch solution, slightly pink potassium permanganate solution, decoction from the black tea.[10]

## Links

### Related articles

- Allergic skin manifestations • Allergy
- Lichenification
- Immunopathological reaction type I

### References


1. HAŠEK, Jan. Péče o pacienta s atopickou dermatitidou – doplnění doporučeného postupu ČLnK. *Prakt. lékáren* [online]. 2014, y. 10, vol. 2, p. 53-60, Available from <http://www.solen.cz/pdfs/lek/2014/02/03.pdf>.
2. Atopic eczema in children. Clinical guideline 57, National Institute for Health and Clinical Excellence, London, 2007; (10), ISBN 1-84629-559-9.
3. https://cks.nice.org.uk/eczema-atopic! topicsummary, datum náhledu 4.1.2014
4. ČELAKOVSKÁ, J.. Výživa u atopického ekzému. *Dermatol. praxi* [online]. 2012, y. 6, vol. 3, p. 127-130, Available from <http://www.solen.cz/pdfs/der/2012/03/04.pdf>.
5. Sicherer S, Sampson H. Food hypersensitivity and atopic dermatitis: pathophysiology, epidemiology, diagnosis, and management. J Allergy Clin Immunol, 1999; 104: 114–122.
6. Sampson H. Food allergy. Part 1: immunopathogenesis and clinical disorders: J Allergy Clin Immunol, 1999; 103: 717–728.
7. Sampson H, Scanlon S. Natural history of food hypersensitivity in children with atopic dermatitis.. J Pediatr, 1989; 115: 23–27.
8. Čapková Š, Špičák V, Vosmík F. Atopický ekzém. ISBN 978-80-7262-645-8.
9. Pracovní skupina dětské gastroenterologie a výživy. Doporučení pracovní skupiny gastroenterologie a výživy ČPS pro výživu kojenců a batolat. *Česko-slovenská pediatrie.* 2014, vol. duben, p. 34, ISSN 0069-2328.
10. RŮŽIČKOVÁ JAREŠOVÁ, L. Akné a atopická dermatitida v ordinaci pediatra. *Pediatr. praxi* [online]. 2011, y. 12, vol. 5, p. 310-312, Available from <http://www.solen.cz/pdfs/ped/2011/05/05.pdf>.
11. ČAPKOVÁ, Š. Nejčastější kožní choroby v dětském věku a jejich léčba. *Dermatol. praxi* [online]. 2009, y. 3, vol. 3, p. 119-124, Available from <http://www.solen.cz/pdfs/der/2009/03/03.pdf>.
12. Chromej I. Atopický ekzém. Banská Bystrica: Dali – BB, 2007
13. Litvik R. Zásady léčby atopické dermatitidy. Farmakoterapie, 2009; 4: 421–432
14. Polášková, S. Proč může selhat léčba u dětí s atopickou dermatitidou. Farmakoterapie, 2008; 4(Suppl.:) 332–335