

Clinical Symptoms of Atopic Eczema

M. Deleuran, A. Braae Olesen, K. Thestrup-Pedersen

5.1 Introduction

Engman et al. defined atopic eczema as “itch that rashes, not an itching rash” [1]. This brief definition underscores that itch is the primary symptom of atopic eczema and that scratching of the skin leads to eczema. The definition would fit every atopic eczema child, but would include more patients than we would accept today.

The best summary of possible symptoms in atopic eczema is included in the definition given by Hanifin and Rajka [2], who described the major symptoms as itch, chronic relapsing eczema, genetic predisposition, dry skin, and the many minor symptoms (Fig. 5.1), as listed in Table 5.1.

However, when doing regression analysis of the minor symptoms, it was observed by the UK Working Party for Atopic Dermatitis that a much simpler definition of the disease sustained a high sensitivity and specificity [3]. This definition is listed in Table 5.2. The set of criteria has been validated and shown to be useful. The interesting thing is that the only clinical sign needed is visible flexural dermatitis (Fig. 5.2). The rest are questions on history. Thus, this definition is excellent for epidemiological studies.

A third definition of atopic eczema puts IgE-mediated allergy as a requirement for the diagnosis [4], but the definition has been criticized [5]. The presence of type I allergy is low in infants and children, but reaches 80% of adults with atopic eczema [6]. This forms the background for dividing atopic eczema into extrinsic and intrinsic eczema [7], i. e. whether allergy is present toward environmental allergens or not. It should be stressed that the clinical symptoms of extrinsic vs intrinsic eczema are the same except for the allergy.

Table 5.1. Minor symptoms of atopic dermatitis (Hanifin and Rajka [2])

Dry skin
Ichthyosis
Palmar hyperlinearity
Keratosis pilaris
Type I allergy and increased serum IgE
Hand and foot dermatitis
Cheilitis
Nipple eczema
Increased presence of <i>Staphylococcus aureus</i> and <i>Herpes simplex</i>
Perifollicular keratosis
Pityriasis alba
Early age of onset
Recurrent conjunctivitis
Dennie-Morgan infraorbital fold
Keratoconus
Cataract
Orbital darkening
Facial pallor/facial erythema
Anterior neck folds
Itch when sweating
Intolerance to wool and lipid solvents
Perifollicular accentuation
Food intolerance
Course influenced by environmental and emotional factors
White dermographism or delayed blanch

Table 5.2. UK Working Party’s diagnostic criteria for atopic dermatitis [3]

History of flexural dermatitis
Onset under the age of 2 years
Presence of an itchy rash
Personal history of asthma
History of dry skin
Visible flexural dermatitis

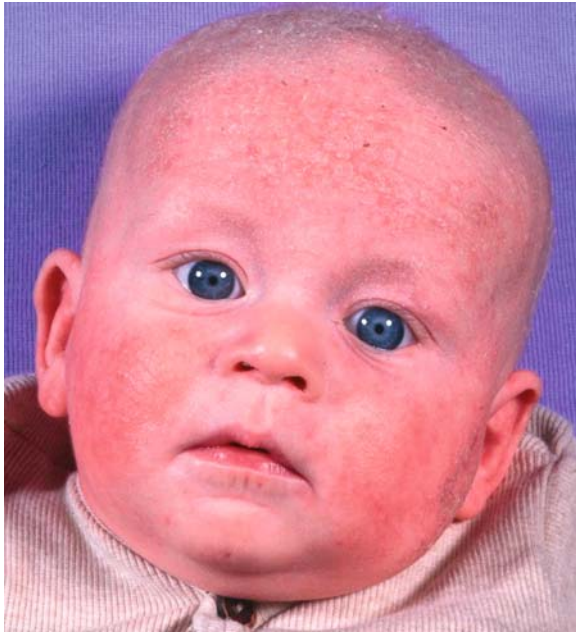


Fig. 5.1. An infant with xerosis of the forehead and scalp combined with erythema. Similar eczematous changes are present on the cheeks. He has infraorbital or Morgan's folds. Yamamoto's sign is the lack of eczema on the tip of the nose



Fig. 5.2. Typical flexural eczema that is not well marked is another feature of atopic eczema. Note the excoriated small papules and longer scratch marks



Fig. 5.3. Typical truncal dermatitis in an infant with atopic eczema. Note that the eczema has no well-marked borders, but does contain nummular eczema elements. These elements are excoriated

Figure 5.1 shows atopic eczema. It illustrates many facts about the disease: the xerosis, erythema, facial eczema as a typical location, and the fact that atopic eczema develops in infancy. It also shows Yamamoto's sign: the skin on the tip of the nose is never (or almost never) involved in atopic eczema.

5.2 Evolution of Atopic Eczema

Atopic eczema starts in the scalp and spreads in a craniocaudal direction to involve the face, the neck, the upper extremities, the trunk, and the lower extremities (Figs. 5.1 – 5.3). The cheeks are most commonly affected in infants, whereas antecubital and popliteal eczema is common in children. Severe atopic eczema will involve all regions, but mild eczema tends to stay in the scalp-face-neck regions only. The areas affected are those where the epidermis is thin and penetration of irritants, infective agents and/or superantigens, and/or allergens have the most easy access to the immune system (Fig. 5.1, Table 5.2).



Fig. 5.4. Very early atopic eczema, where a differential diagnosis of seborrheic eczema could be discussed. However, the course showed atopic eczema. This is the typical location for the first symptoms of atopic eczema

5.3 Course of Atopic Eczema

Atopic eczema is not present at birth, but can develop within the first weeks of infancy. It develops in 90% of subjects before the age of 4 years [8]. It is an early-life event. A Scottish study showed that the 1-year prevalence among infants is almost equal to the point prevalence, but after the age of 2 this changes dramatically as the 1-year prevalence among 2- to 11-year-old children was around 9%, whereas the point prevalence was approximately 2.5% [9]. Thus, from age 2 to 11 years, atopic eczema either disappears, which may happen among one-fifth of children, or it becomes a fluctuating disease, where approximately two-thirds of the children grow out of their disease before the teenage years [10].

Gender differences have been claimed, but they depend on the age of the child. Boys develop atopic eczema at an earlier age than girls [11].

The course of atopic eczema is thus one of almost constant eczema in infancy (infantile eczema) followed by a year-long period in which the eczema comes and goes and disappears among two-thirds or even more before the teenage years (childhood eczema). Docu-



Fig. 5.5. Cheilitis in a patient with atopic eczema of the papulous type



Fig. 5.6. Severe adult atopic eczema with lichenification of the skin. Note the pustules and the scratch marks of papules

mentation for the continuation or relapse of atopic eczema into adulthood is not good, but roughly 15%–25% will have eczema in their early twenties (adolescent and young adult atopic eczema). Atopic eczema in adulthood is rare, but if present the symptoms are often very pronounced and persistent (Fig. 5.6) [12].

The course and severity are coherent. Severe eczema develops early in life, is more constantly present and lasts longer. Eczema severity has a wide range: 10%–15% of infants or children have severe eczema, 30%–40% moderate eczema, and the rest has mild eczema [13].

5.4 Some Typical Clinical Features

5.4.1

The Itch

The sensation of itch is the major symptom of atopic eczema. From week 6–8, infants show symptoms of itch by grabbing their skin with the fingers to scratch. Itching is present during sleep and often leads to sleep disturbances, where the child wakes up crying after 1 h of sleep.

The excoriation in atopic eczema is one of damaging the epidermis, i.e. it leaves scratch marks (Fig. 5.6, 5.7) – an observation completely different with the reaction to urticarial itch, where patients rub their skin without leaving excoriations. The physical damage to the skin



Fig. 5.7. Atopic eczema on an upper extremity of an infant. Here the eczema is slightly oozing – wet eczema – which is an indication of superinfection with *Staphylococcus aureus*. Note the pronounced scratch marks

can induce eczema and over time will explain the development of papules and finally lichenification (Fig. 5.6).

Itch is not a constant symptom. In the morning, itch is not prominent. But when the child gets tired in the afternoon then attacks of itch start. The child becomes irritable, cries, misbehaves, and this often leads to clashes between the parent(s) and the child, which can be most distressing for the parents.

The following are a few stories on how adult patients and a parent react to itch:

- “When I have my itch attacks I feel like I’m inside a shell. I can hear what people are saying to me, but I cannot think or respond as the itch is overwhelming me.”
- “When I have severe itch attacks in the evening, I go outside, sit down, sometimes read a book – until my skin feels like I have been sitting in the fridge. Then I am fine for 1 or 2 hours.”
- “When my daughter is severely itching in the evening, I take a blanket, put it in the freezer for half an hour, and put it on top of her bed sheet. The cooling effect relieves her itch significantly.”
- “The silliest thing you can say to a person itching is stop scratching.”

Itch is thus most prominent in the afternoon and evening, when the child or adult is tired. Itch is provoked by heat. These simple observations are important as treatment should preferably be given in the afternoon (application of topical steroids or calcineurin inhibitors, whereas emollients are sufficient in the morning).

There is an association between increased stress and increased itch, but its pathophysiological relation is unknown.

5.4.2

Other Clinical Symptoms

Table 5.3 lists 18 signs in atopic eczema and how these symptoms were scored by seven dermatologists evaluating the same patients. Substantial agreement was only found for truncal dermatitis [14]. This observation underlines our difficulties in estimating and scoring symptoms of atopic eczema.

In Germany, the diagnosis of eczema infantum is sometimes used if an infant has skin changes compatible with eczema, but which are not classical of atopic eczema. Approximately three-fourths of these infants later develop atopic eczema [15].

Table 5.3. Interobserver agreement for 17 signs in atopic eczema when scored by seven experienced dermatologists [14]

Agreement	Clinical symptom
Substantial	Truncal dermatitis
Moderate	Facial dermatitis, flexural dermatitis, hand/foot dermatitis, hypopigmented patches, orbital fold, periorbital dermatitis, ear fissure, hyperlinear palms
Fair	Follicular accentuation, perioral dermatitis, cheilitis
Slight	Keratosis pilaris, periorbital pigmentation, extensor dermatitis (visible), dry skin, fine hair

It is typical that the borders of eczematous skin are ill defined and that it tapers off into normal-looking skin. However, even in normal-looking skin there is an increase in lymphocytes [16], meaning that atopic eczema likely involves more than what is clinically perceptible.

Although the UK definition of atopic eczema only has “visible flexural dermatitis” as a clinical requirement, there are many signs which support the diagnosis of eczema. The figures illustrate these signs (Fig. 5.5, 5.8, 5.9). The typical lesions are erythema, xerosis without true scaling, and vesicles which are almost always excoriated and ill-defined borders. However, there are other forms of atopic eczema such as papulous atopic eczema, as seen in Fig. 5.11, nummular eczema as seen in Fig. 5.3, and impetiginous eczema as also seen in Figs. 5.9, 5.11. The excoriations lead to lichenification as seen in Fig. 5.6.

One clinical symptom which is likely underdiagnosed are urticarial rashes, which come quickly and also disappear quickly. It is our guess that 15% of children actually have these urticarial rashes and will benefit from antihistamines.

There are distinct features of atopic eczema beyond those described above. Keratosis pilaris is commonly seen on the extensor sides of the upper arms, as is pityriasis alba. Again, the list of symptoms in Hanifin and Rajka’s definition (Table 5.1) covers special symptoms of atopic eczema well. Atopic winter feet is a condition with erythema, scaling and fissuring of the soles, mostly on the anterior part of the foot. The name stems from the symptoms being most pronounced during winter. It occurs in children and is difficult to treat. Toilet seat eczema, with nummular eczema in the pressure area on the buttocks and thighs, is also frequently observed.



Fig. 5.8. A typical location of atopic eczema is behind the ears with a tendency toward fissuring skin at the lower end of the earlobe



Fig. 5.9. Severe atopic eczema, especially as periorbital eczema, with oozing and crust formation as signs of secondary infection. Note Yamamoto’s sign, i.e., no eczema on the tip of the nose

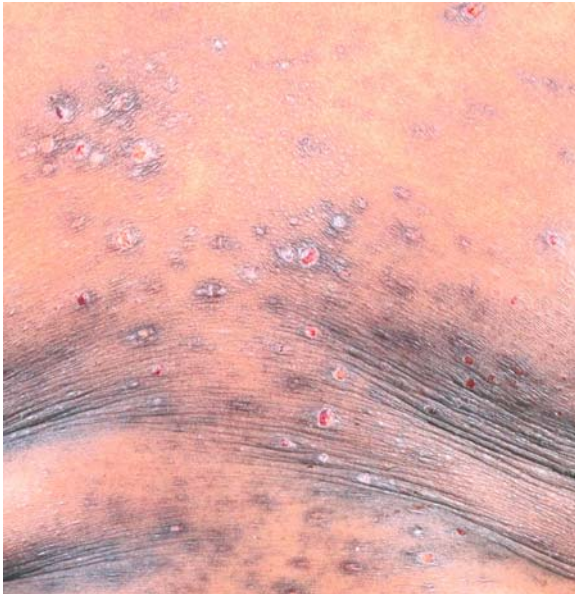


Fig. 5.10. Same patient as in Fig. 5.5. Note how excoriated papules are a prominent clinical symptom of his atopic eczema. Given his African background, he develops intensive hyperpigmentation due to scratching of the skin

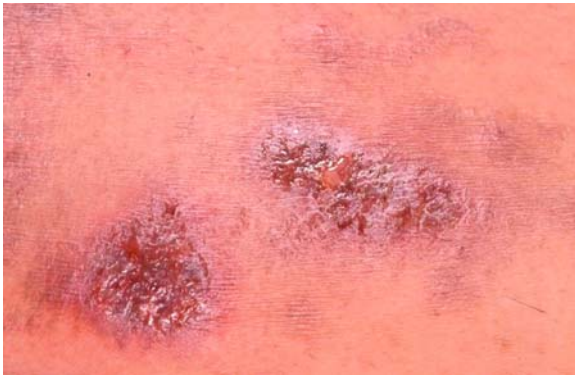


Fig. 5.11. The nummular type of atopic eczema with oozing as a sign of secondary infection, also called impetiginous eczema

5.5 Atopic Eczema in the Adult Patient

Adults with atopic eczema normally have moderate to severe eczema. A particular form is the head-and-neck eczema as illustrated in Fig. 5.12. It has been related to allergy to *Pityrosporum ovale* (now termed *Malassezia furfur*) [17]. Systemic antifungal therapy has been proven of value by some authors, but experience is

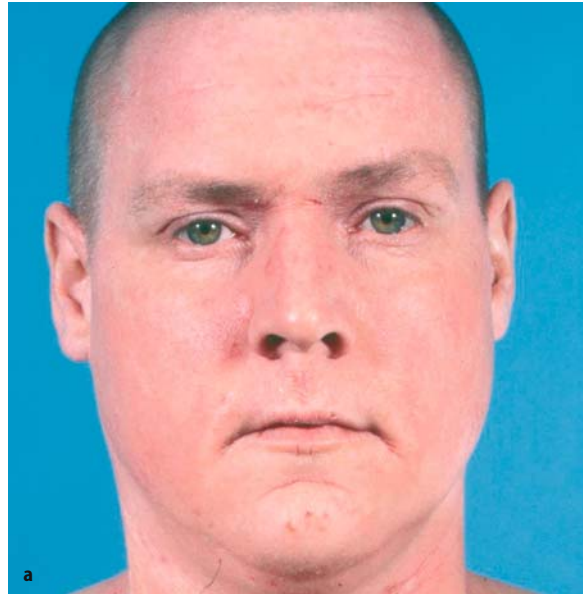


Fig. 5.12a, b. Head-and-neck-dermatitis in a patient who most of the time suffered from severe universal atopic eczema

mixed. The head-and-neck eczema carries a high risk for persistence of eczema, which occurs among 59% of adult patients [12]. Severe atopic eczema going toward exfoliative dermatitis is fortunately uncommon (Fig. 5.13). These patients need intensive systemic immunosuppressive therapy. Complications are com-

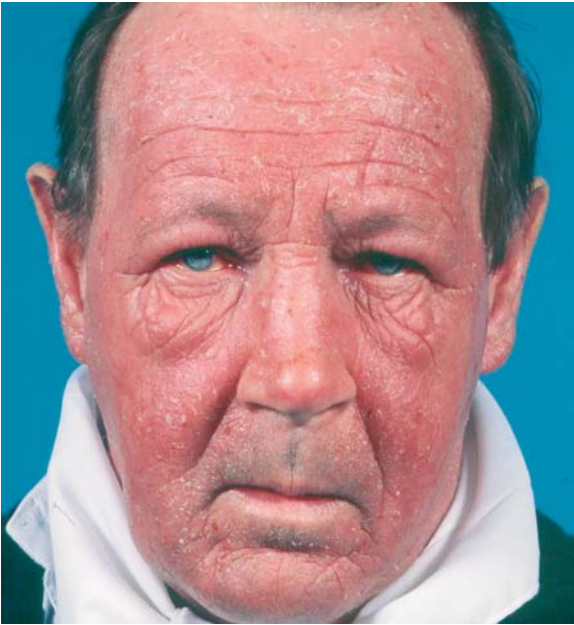


Fig. 5.13. Exfoliative erythrodermia in an adult with life-long atopic eczema and given vitamin C intravenously as an antioxidative therapy. It took 6 weeks on systemic prednisone to subdue his eczema



Fig. 5.14. 15-year-old girl who had previously suffered from atopic eczema. Her boyfriend had herpes simplex and she developed severe eczema herpeticum even though she did not have atopic eczema just prior to this event. She later had a flare up of atopic eczema upon activation of her immune system

mon, in particular impetiginized eczema. A rarer, but serious event is eczema herpeticum (Fig. 5.14). This can occur in children, but is rare.

5.6

The Prognosis of Atopic Eczema

There are a number of dermatological diseases, which tend to evolve on an atopic eczema background. Up to 40% of adults with previous atopic eczema develop hand eczema, most often of the irritant contact eczema type [18]. Of patients developing dyshidrotic eczema or pompholyx, 50% have had atopic eczema previously [19]. Nummular eczema is often associated with previous atopic eczema. Thus, a child with atopic eczema has an altered immune system and is liable to experience inflammatory skin diseases later in life.

The only exclusive disease of atopic eczema may be psoriasis [20], which is surprising as there seem to be common inflammatory gene loci among the two disorders [21]. However, this exclusion has been questioned [22, 23].

5.7

Atopic Eczema and Differential Diagnoses

Many physiological skin changes are present in early infancy – from the scaling scalp of the newborn (arp), seborrheic eczema, diaper dermatitis, or xerotic changes of temporary occurrence, to the flushing or urticarial changes of early infancy, and viral exanthemas. Scabies can resemble atopic eczema. Rare cases of Jadassohn's psoriatic dermatitis should not be confused with atopic eczema as ichthyosis. Children with severe combined immunodeficiency may develop eczema-like changes, and Netherton's syndrome resembles atopic eczema.

5.8

Conclusion

Atopic eczema is a clinical diagnosis based on visible eczema with a characteristic history. There are no diagnostic tests that can confirm the diagnosis. It is up to the individual physician to learn about its symptoms, which is again a prerequisite for giving the proper and correct treatment.

References

1. Engman MF, Weiss RS, Engman ME (1936) Eczema and environment. *Med Clin North Am* 20:651-663
2. Hanifin JM, Rajka G (1980) Diagnostic features of atopic dermatitis. *Acta Derm Venereol (Stockh) Suppl* 92:44-47
3. Williams HC, Burney PGJ, Hay RJ, Archer CB, Shipley MJ, Hunter JJA, Bingham EA, Finlay AY et al. (1994) The UK Working party's diagnostic criteria for atopic dermatitis. I. Derivation of a minimum set of discriminators for atopic dermatitis. *Br J Dermatol* 131:383-396
4. Bos JD, Van Leent EJ, Sillevius Smitt JH (1998) The millennium criteria for the diagnosis of atopic dermatitis. *Exp Dermatol* 7:132-138
5. Eedy DJ (2001) What is new in atopic dermatitis? *Br J Dermatol* 145:380-384
6. Rudzki E, Litweska D (1990) RAST and PRIST in children with atopic dermatitis. *Dermatologica* 180: 82-85
7. Wuthrich B, Schmid-Grendelmeier P (2003) The atopic eczema/dermatitis syndrome. Epidemiology, natural course, and immunology of the IgE-associated ("extrinsic") and the nonallergic ("intrinsic") AEDS. *J Invest Allergol Clin Immunol* 13:1-5
8. Olesen AB, Ellingsen AR, Larsen FS, Larsen PO, Veien NK, Thestrup-Pedersen K (1996) Atopic dermatitis may be linked to whether a child is first- or second-born and/or the age of the mother. *Acta Derm Venereol (Stockh)* 76:457-460
9. Herd RM, Ridman TJ, Prescott RJ, Hunter JA (1996) Prevalence of atopic eczema in the community: the Lothian Atopic Dermatitis study. *Br J Dermatol* 135:18-19
10. Williams HC, Strachan DP (1998) The natural history of childhood eczema: observations from the British 1958 birth cohort study. *Br J Dermatol* 139:834-839
11. Bohme M, Lannero E, Wickman M, Nordvall SL, Wahlgren CF (2002) Atopic dermatitis and concomitant disease pattern in children up to two years of age. *Acta Derm Venereol* 82:98-103
12. Sandstrom MH, Faergemann J (2004) Prognosis and prognostic factors in adult patients with atopic dermatitis: a long-term follow-up questionnaire study. *Br J Dermatol* 150:103-110
13. Olesen AB, Bang K, Juul S, Thestrup-Pedersen K (2005) Stable incidence of atopic dermatitis among children in Denmark during the 1990s. *Acta Derm Venereol* 85: 244-247
14. Williams HC, Burney PGJ, Hay RJ, Strachan D, Hay RJ (1994) The U. K. Working party's diagnostic criteria for atopic dermatitis. II. Observer variation of clinical diagnosis and signs of atopic dermatitis. *Br J Dermatol* 131:397-405
15. Fölster-Holst R, Weichenthal M, Steinsland K, Polzhofer G, Christophers E (2004) Eczema infantum and its prognosis. *Acta Derm Venereol* 84:410-412
16. Ellingsen AR, Sorensen FB, Larsen JO, Deleuran MS, Thestrup-Pedersen K (2001) Stereological quantification of lymphocytes in skin biopsies from atopic dermatitis patients. *Acta Derm Venereol (Stockh)* 81:258-262
17. Johansson C, Sandstrom MH, Bartosik J, Sarnhult T, Christiansen J, Zargari A, Back O, Wahlgren CF, Faergemann J, Scheynius A, Tengvall Linder M (2003) Atopy patch test reactions to Malassezia allergens differentiate subgroups of atopic dermatitis patients. *Br J Dermatol* 148:479-488
18. Rystedt I (1985) Work-related hand eczema in atopics. *Contact Dermatitis* 12: 164-171
19. Lodi A, Betti R, Chiarelli G, Urbani CE, Crosti C (1992) Epidemiological, clinical and allergological observations on pompholyx. *Contact Dermatitis* 26:17-21
20. Christophers E, Henseler T (1987) Contrasting disease patterns in psoriasis and atopic dermatitis. *Arch Dermatol (Res)* 279 [Suppl]:S48-S51
21. Bowcock AM, Cookson WO (2004) The genetics of psoriasis, psoriatic arthritis and atopic dermatitis. *Hum Mol Genet* 13 [Suppl 1]:R43-R55
22. Williams HC, Strachan DP (1994) Psoriasis and eczema are not mutually exclusive diseases. *Dermatology* 189:238-240
23. Olesen AB (2005) Diseases rarely associated with atopic eczema. In: Ring J, Przybilla B, Ruzicka T (eds) *Handbook of Atopic Eczema* (this volume)