



## Original Research Article

# Evaluation of the minor clinical features of Hanifin and Rajka amongst children with atopic dermatitis, visiting a tertiary care hospital in North Eastern India

Shreeni Chatterjee<sup>1\*</sup>, Bhaskar Gupta<sup>1</sup>, Debajit Das<sup>2</sup><sup>1</sup>Dept. of Dermatology, Silchar Medical College and Hospital, Silchar, Assam, India<sup>2</sup>Tinsukia Medical College & Hospital, Tinsukia, Assam, India

## ARTICLE INFO

## Article history:

Received 09-05-2024

Accepted 30-09-2024

Available online 04-11-2024

## Keywords:

Atopic dermatitis

children

Hanifin and Rajka's criteria

Northeast India

## ABSTRACT

**Background:** Atopic Dermatitis (AD) is a commonly encountered, extremely itchy, chronic and relapsing skin disorder, which is characterized by inflammation in the skin. It typically has its onset in childhood, presenting with eczematous lesions; and can also be associated with personal or family history of “atopy”, usually most often. The criterion put by Hanifin and Rajka, encompassing 4 major plus 23 minor criteria, is not infrequently used as a diagnostic criterion for this disease in a hospital setup; however, the frequency of occurrence of the minor criteria usually varies in the population.

**Aim:** The study aims at estimating the frequency of the minor diagnostic criteria of the Hanifin and Rajka in children with AD.

**Materials and Methods:** This was a hospital-based cross-sectional study, that was conducted on 70 children (less than 18yrs of age) by taking their history, doing clinical and ophthalmological examination and some basic tests.

**Results:** The most common occurrence amongst the minor criteria estimated from our study was xerosis i.e., in 45(64.2%). The other common minor criteria observed were pityriasis alba (42.8%) facial erythema (40%), orbital darkening (37.14%) Early age of onset was seen in children (35.7%).

**Conclusion:** There is variation in the clinical features of AD according to geography and population. The prevalence and severity of the disease are dependent on several factors like ethnicity/race and environment. Hence, it is important for dermatologists to know the usual and common ways the disease presents, in a given population for the diagnosis so as to diagnose and treat the patients at an earlier stage and before significant discomfort.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprint@ipinnovative.com](mailto:reprint@ipinnovative.com)

## 1. Introduction

Atopic eczema (AE) (same as Atopic Dermatitis) is difficult to define, since it is associated with variable clinical features, varies in severity and most importantly, there is no single and specific test for its diagnosis.<sup>1</sup> The definition that is usually and widely taken into consideration is that: AE is an itchy, chronically relapsing inflammatory skin condition starting from early childhood

(usually before 2 years of age) for the first time and usually improving with age.<sup>2</sup> There is erythema, itchy papules and papulovesicles (vesicles are more in infants). Due to the intense itching, there are excoriations initially and due to further and prolonged itching and rubbing, the lesions become lichenified, eventually, presenting as hyperpigmented, thick plaques with accentuated skin markings on the area. The distribution varies from being predominant in extensors in early childhood to becoming typically flexural with advancing age. Adult-onset AE is flexural primarily. Not infrequently, is it associated with

\* Corresponding author.

E-mail address: [mishmi\\_chi@yahoo.co.in](mailto:mishmi_chi@yahoo.co.in) (S. Chatterjee).

other atopic conditions in the individual or their family members. Those patients, harbouring a filaggrin (FLG gene) mutation also have ichthyosis vulgaris, keratosis pilaris and hyperlinear palms.<sup>3</sup> There are many diagnostic criteria for AD. How far effective the criteria are in different population (as seen in and concluded from different studies), varies, because the presentations and severity of symptoms vary with genetic background, climate, geographical regions, food habits, socioeconomic status, availability of health-care facilities, and many other factors. Hanifin and Rajka proposed major and minor diagnostic criteria based on their clinical experience. These criteria allow uniformity of diagnosis for hospital-based and experimental studies. It is the first developed and the most cited criteria.<sup>3–5</sup> The minor criteria may vary in different population. The concept of “Atopic march”, which refers to the sequence of Atopic Dermatitis to asthma to finally allergic rhinitis with age<sup>6,7</sup> is not well established in India, as the condition is usually not that severe here, due to hotter climate, probably.<sup>8,9</sup> In this study, we establish the frequency of Hanifin and Rajka’s minor criteria in a population of children attending a tertiary care hospital in North-East India.

## 2. Materials and Methods

This hospital-based cross-sectional study had taken in 70 paediatric cases with AD attending the dermatology outpatient department of a tertiary care hospital, in the period - January 2022 to December 2023. A meticulous history was procured with respect to the present age, age of onset of disease (early age of onset was defined as onset of symptoms of the condition before the age of 5 years, as considered by Nagaraja et al and Böhme et al),<sup>10,11</sup> whether there was presence of a nonspecific hand/foot dermatitis in the children (defined as the presence of itchy papules/vesicles and erythema on one or both hands/feet, with or without oozing, crusting, fissures, or lichenification),<sup>11,12</sup> any history of recurrent episodes of conjunctivitis, any complain of itching when the child sweats, if there was any intolerance to woolen wear, causing discomfort, if there was any allergy to certain food. Also influence of environmental and/or emotional factors on course of disease was enquired for. Clinical examination was done meticulously. The following findings were recorded like, the presence of xerosis [Figure 1], ichthyosis, palmar hyperlinearity (if more than 5 prominent lines present, which are longer than 1 cm running across palm, similar to the description by Böhme et al.)<sup>11</sup> keratosis pilaris [Figure 2] (more than 20 follicular, keratotic papules on the posterolateral aspects of upper arms or thighs),<sup>11</sup> Dennie–Morgan infraorbital folds [Figure 3] (which are said to be present, when one of the infraorbital creases running laterally crossed the pupillary midline, as described by Mevorah et al.)<sup>13</sup> orbital darkening, cheilitis, nipple eczema, facial pallor (accentuated around nose and or eyes) or

erythema (erythema over cheeks devoid of papules/scaling); pityriasis alba, anterior neck folds (prominent skin creases, running horizontally on anterior aspect of neck, when head held upright), perifollicular accentuation (aggravation of the dermatitis around hair follicles in  $\geq 2$  areas with a diameter  $>5$  cm),<sup>11</sup> and white dermographism. Patients were sent for Ophthalmological evaluation to look for the presence of keratoconus and anterior subcapsular cataract to the ophthalmology OPD.

## 3. Results

Our study involved 70 cases, where the mean age of the patients was 5.6 years. Out of them, 36 were male and 34 were female. The most common occurrence amongst the minor criteria, observed in our study was xerosis i.e., in 45(64.2%) of the 70 cases. The other common minor criteria noticed were pityriasis alba in 30 (42.8%) of 70; facial erythema 28 (40%) of 70 orbital darkening 26 (37.14%) of 70 cases. Early age of onset was seen in children (35.7%). Ophthalmological examination of 70 cases aged 2 years and above revealed no abnormality.

Intolerance to woolen garments was found 15(21.4%) of our patients and Food intolerance was found in only 2 out of the 70 cases. Nipple eczema, recurrent conjunctivitis, and white dermographism were not observed in any of our patients.



**Figure 1:** Dennie- Morgan folds and Pityriasis alba noted in an atopic child.



**Figure 2:** An atopic child, with rhinitis, generalized dry skin [xerosis] and Dennie-Morgan fold



**Figure 3:** A 10 year old atopic child, with xerosis and Pityriasis alba



**Figure 4:** Keratosis pilaris in an atopic child



**Figure 5:** Pityriasis alba and xerosis in an atopic child.

#### 4. Discussion

AD is a chronic and relapsing skin disease causing much discomfort and distress to the affected child as well as their parents. It is observed that there are variations in the presentation of the disease and its severity with genetic background, climate, geographical regions, food habits, socioeconomic status, availability of health-care facilities, and many other factors. Amongst the available diagnostic criteria, the most important and commonly used ones are - Hanifin and Rajka's criteria, U. K. diagnostic criteria

(William et al., 1994), and ISAAC (International Study of Asthma and Allergies in childhood) questionnaire (1995).<sup>1</sup> Hanifin and Rajka's criteria are suitable to apply in any hospital setup. The criteria consist of 4 major criteria and 23 minor criteria. We give the diagnosis as AD when the presence of three from each category is noted.<sup>3</sup> The mean age of the patients in our study was 5.6 years. This is slightly more than that was observed in the studies conducted by Dhar et al. and Nagaraja et al., on children aged 3 months to 12 years, in which it was  $4.37 \pm 3.42$  years and  $4.04 \pm 3.42$  years, respectively.<sup>8,9</sup> The most common minor criteria that was seen from our study was the presence of xerosis, which was seen in 64% of the cases. Böhme et al, found 100% cases with xerosis.<sup>11</sup> Xerosis is so common as the skin's barrier function is disrupted in the condition. The study by Parthasarathy et al showed Dennie-Morgan folds as the most common clinical feature.<sup>10</sup> Some other criteria like the presence of pityriasis alba, and the early age of onset of the condition, were also seen in higher frequency in our study, i.e., 42.8% and 35.7% respectively. The high value of pityriasis alba differs from the finding by Agrawal et al.<sup>14</sup> Perifollicular accentuation was 17.1% like other Indian studies.<sup>13</sup> Ocular examination to diagnose keratoconus and anterior subcapsular cataract was performed by ophthalmologist in our hospital. None of the two was observed in our case. In 17.4% of the patients, intolerance to woolen garments was present, as the parents mentioned that the child usually feels discomfort and itchy on wearing woolen clothes. Again, no one made any complain about any intolerance to lipid solvents. Nagaraja et al. observed intolerance to wool in 41% of the children.<sup>10</sup> This could be probably due to the fact that most patients in our geographical area did not wear woollens for considerable time of the year, owing to the weather of the region. Out of 70 cases in our study, 15 of the cases gave a history of aggravation of the condition during winter season while none gave history of summer exacerbation. This is in contrast to other study conducted at Southern parts of India where winter and summer exacerbation were comparatively less.<sup>15</sup> This could be explained by the prolonged and harsh winter seen in north-eastern India compared to the southern part. Criteria such as nipple eczema, recurrent conjunctivitis, food hypersensitivity, and white dermographism were not seen in our study. Nagaraja et al noted that none of the patients gave history of food intolerance but we found 2 patients out of 70, complaining of food intolerance.<sup>10</sup>

## 5. Conclusion

It can be easily made out from the discussion that the clinical features of AD are quite variable. The prevalence and severity of AD depend on a lot of factors like ethnicity/race, environment and diet. So, it is really important that clinicians are aware of the common clinical features of AD

in a given population so that the diagnosis is early. By this, they can treat the disease early to reduce the morbidity. Also, proper counselling regarding the chronicity of the condition and things that can aggravate it, can be given thereof.

## 6. Declaration of Patient Consent

The authors certify that they have procured all necessary and appropriate consent forms from the guardians of the patients where they have read the forms and thereby agreed that the images and other clinical information of their children would be reported in the journal. They were also made aware that the names and initials of the patients will not be published and all measures will be taken to not disclose their identity, however anonymity cannot be guaranteed.

## 7. Source of Funding

None.

## 8. Conflict of Interest


None.

## References

1. Breninkmeijer EE, Schram ME, Leeftang MM, Bos JD, Spuls PI. Diagnostic criteria for atopic dermatitis: A systematic review. *Br J Dermatol*. 2008;158(4):754–65.
2. Dhar S, Banerjee R. Atopic dermatitis in infants and children in India. *Indian J Dermatol Venereol Leprol*. 2010;76(5):504–13.
3. Arden-Jones MR, Flohr C, Reynolds NJ, Holden CA, Barker CE, Bleiker J. Atopic eczema. In: Griffiths CE, Barker J, Bleiker T, Chalmers R, Creamer D, editors. *Rook's Textbook of Dermatology*. vol. 41. Blackwell Publishing: Oxford; 2016. p. 1–41.
4. Hanifin JM, Rajka G. Diagnostic Features of Atopic Dermatitis. *Acta Dermato-Venereologica*. 1980;60(92):44–7.
5. Andersen RM, Thyssen JP, Maibach HI. Qualitative vs. quantitative atopic dermatitis criteria – in historical and present perspectives. *J Eur Acad Dermatol Venereol*. 2016;30(4):604–18.
6. Spergel JM, Paller AS. Atopic dermatitis and the atopic march. *J Allergy Clin Immunol*. 2003;112(6):118–27.
7. Zheng T, Yu J, Oh MH, Zhu Z. The atopic march: progression from atopic dermatitis to allergic rhinitis and asthma. *Allergy Asthma Immunol Res*. 2011;3(2):67–73.
8. Kanwar AJ, Dhar S. Severity of atopic dermatitis in India. *Br J Dermatol*. 1994;131(5):733–4.
9. Dhar S, Kanwar AJ. Grading of severity of atopic dermatitis in North Indian children. *Indian J Dermatol*. 1995;40(2):67–72.
10. Nagaraja, Kanwar AJ, Dhar S, Singh S. Frequency and significance of minor clinical features in various age-related subgroups of atopic dermatitis in children. *Pediatr Dermatol*. 1996;13:10–3.
11. Böhme M, Svensson A, Kull I, Wahlgren CF. Hanifin's and Rajka's minor criteria for atopic dermatitis: Which do 2-year-olds exhibit? *J Am Acad Dermatol*. 2000;43(5):785–92.
12. Dhar S, Kanwar AJ. Epidemiology and clinical pattern of atopic dermatitis in a North Indian pediatric population. *Pediatr Dermatol*. 1998;15(5):347–51.
13. Mevorah B, Frenk E, Wietlisbach V, Carrel CF. Minor clinical features of atopic dermatitis. Evaluation of their diagnostic significance. *Dermatologica*. 1988;177(6):360–4.
14. Agrawal DP, Lavanya MS, Sathyanarayana BD, Swaroop MR, Jain M, Dukkupati M, et al. Evaluation of clinical diagnostic criteria of atopic dermatitis and serum IgE levels in patients with chronic eczema. *Int J Health Sci Res*. 2015;5(11):84–9.

15. Parthasarathy N, Palit A, Inamadar AC, Adya KA. A study to estimate the frequency of Hanifin and Rajka's minor criteria in children for diagnosis of atopic dermatitis in a tertiary care centre in South India. *Indian J Paediatr Dermatol*. 2019;21(1):31–5.

### Author's biography

**Shreeni Chatterjee**, Post Graduate Trainee  <https://orcid.org/0009-0002-3951-735X>

**Bhaskar Gupta**, Professor and HOD  <https://orcid.org/0000-0002-0701-2018>

**Debajit Das**, Associate Professor  <https://orcid.org/0009-0001-8727-2476>

**Cite this article:** Chatterjee S, Gupta B, Das D. Evaluation of the minor clinical features of Hanifin and Rajka amongst children with atopic dermatitis, visiting a tertiary care hospital in North Eastern India. *IP Indian J Clin Exp Dermatol* 2024;10(4):415-419.