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Research Article

Casuistic Revision of Childhood Atopic Dermatitis during Last Three Years in Braga´s Hospital

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Abstract

Background: Atopic dermatitis (AD) is an inflammatory disease, occurring in association with personal or family history of atopy.

Methods: A retrospective study of AD patients, admitted in the consultation of Pediatric Dermatology of our hospital, between the years 2011 and 2013, was carried out. For the purposes of this study, a modified and simplified procedure was adopted for recording severity of AD in our patients, named three-item severity score (TIS score), using three items of Scoring of Atopic Dermatitis (SCORAD) index (erythema, edema and excoriations).

Results: There were 160 patients, with age ranging from 1 month to 15 years and with an equal sex ratio. The prevalence of AD was 17.1%. The most frequent symptom was pruritus (86.9%). Eighty-six percent of patients initiated symptoms before 5 years. The severity of AD was mild/moderate in 139 patients (86.9%) and severe in 21 patients (13.1%). The family and/ or personal history of atopy were positive in 134 patients (84%). Common aggravating factors included wintertime (46.9%) and allergens (16.3%), being the most frequent aeroallergens. Serum IgE was elevated in 17 patients (33.3%). Most patients could be controlled with topical measures (86.3%).

Discussion: The pattern of AD in our Department is similar to other studies, except for a higher prevalence of mild AD, a lower elevation of serum IgE and comparing with countries with tropical weather we have an additional aggravating factor: the lower temperatures during winter, which disturbed barrier function of the stratum corneum.

Keywords: Atopic dermatitis; Atopic march; Allergens; Infantile eczema

Abbreviations

AD: Atopic Dermatitis; SCORAD: Scoring of Atopic Dermatitis; TIS score: Three-item Severity Score

Introduction and Objectives

Atopic dermatitis (AD) is the most common chronic inflammatory skin disease, which affects up to 20% of children and 1-3% of adults in most countries of the world [1,2]. Characteristic features of AD include pruritus and a chronically relapsing course [1,3]. AD is a complex genetic disorder and is often accompanied by other atopic disorders, such as allergic rhinitis, conjunctivitis and asthma [1,4]. These conditions may appear simultaneously or develop in sequence [1]. AD is more frequent in infants and young children, while asthma and pollen allergy predominate in adolescents [1,4]. This sequence is referred to as atopic march [1]. Considering that the atopic disease progression starts with AD, management should be concentrated, not only on the treatment of acute flares, but also on the maintenance therapy [1,4].

The criteria of Hanifin and Rajka have been commonly applied to diagnose AD [2]. There is no pathognomonic laboratory biomarker for diagnosis of AD, since the most typical feature, the elevation of total or allergen-specific IgE in serum is not present in all individuals suffering from AD [1,2]. Consequently the term intrinsic AD has been introduced to differentiate it from extrinsic (IgE associated) forms of AD [2,4].

The purpose of our study is to describe the epidemiologic and clinical characteristics of AD of patients observed in routine consultation and to analyze the different therapeutic modalities used and compare our data with other published series.

Materials and Methods

A retrospective and descriptive study was carried out on patients, with less than 15 years of age, admitted with the diagnosis of AD at our hospital, over a 36-month period, "between" January 2011 to December 2013. Our Hospital is localized in Braga, a city in the northwestern Portuguese district of Braga.

The criteria for the diagnosis of AD in our patients were based on those of Hanifin and Rajka. Dermatologic data were collated from patient's case records. The following information was specifically looked for: sex, age of the first manifestation, personal and family history of atopy, precipitation factors, clinical form, localization, laboratory findings, and number of consultations, therapeutic measures, complications and outcome. For the purposes of this study, a modified and simplified procedure was adopted for recording severity of AD in our patients, named three-item severity score (TIS score), using three items of Scoring of Atopic Dermatitis (SCORAD) index (erythema, edema and excoriations) [5].

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We decided to include in our study only patients with AD observed in routine consultation and we excluded the patients admitted at the urgency with the diagnosis of AD, because in Braga´s hospital, the majority of patients in urgency with the diagnosis of AD are observed by Pediatrics and our aim was to study the AD only in Dermatology´s consultation.

The statistical analysis was performed using the Excel 2007.

Results

During these three years, 160 patients with AD had been admitted in our consultation and they constituted 17.1% of Pediatric Dermatology consultations. Eighty-three patients (51.9%) were girls and 77 patients (48.1%) were boys, with a female to male ratio of 1.08. The age of onset ranged from 1 month to 15 years, with an average of 2.9 years. The majority of the patients developed symptoms of AD in the first 5 years of life (86, 3%). Table 1 shows the age distribution of patients with AD.

One hundred thirty-four patients (83.8%) had family and/ or personal history of atopy.

Table 2 shows the frequency of family history of atopy: 74 patients (46.3%) had at least one first-degree family member with atopic disease: asthma (15.6%), AD (15%), allergic rhinitis (13.8%) and allergic conjunctivitis (1.9%). In 86 patients (53.8%) there was no family history of atopy.

Table 3 shows the frequency of personal history of atopy: 79 patients (49.4%) had a personal history of AD alone, while 81 (50.6%) had a concomitant history of other atopic diseases: 37 patients (23.1%) had allergic rhinitis, 13 patients (8.13%) had asthma and 31 (19.4 %) had asthma and allergic rhinitis.

Table 1: Age distribution of patients with AD.

Age group	Number of patients	Percentages
0-6 months	11	6.9%
>6-12 months	67	41.9%
>1-3 years	43	26.9%
>3-5 years	17	10.6%
> 5 years	22 (13,8)	13.8%
Total	160 (100)	100

Table 2: Frequency of family history of atopy.

Family history of atopy	Number of patients	Percentages
Atopic dermatitis	24	15%
Asthma	25	15.6%
Allergic conjunctivitis	3	1.9%
Allergic rhinitis	22	13.8 %
Irrelevants	86	53.8%

Table 3: Frequency of personal history of atopy.

Personal history	Number of patients	Percentages
Atopic dermatitis (only)	79	49.4%
Asthma	13	8.13 %
Allergic rhinitis	37	23.1 %
Asthma and allergic rhinitis	31	19.4%

The clinical severity of AD observed in our patients at initial presentation was mainly mild AD, which was recorded in 90 patients (56.3%), while 49 patients (30.6%) had moderate eczema and 21 patients (13.1%) had severe eczema.

The most frequent clinical manifestation was purities; present in 139 patients (86.9%).The commonly observed minor features included xerosis in 145 patients (90.6%), keratosis pilaris in 19 patients (11.8%), infraorbital folds in 17 patients (10.6%), pityriasis alba in 15 patients (9.4%), cheilitis in 7 patients (4.4%), palmar hyperlinearity in 5 patients (3.1%) and nipple eczema in 5 patients (3.1%).

In the age group of 0-2 years the lesions predominated on the extensor surfaces in 56% of patients, while in the group >2-15 years the lesions had a flexural distribution in 74.1% of patients. Facial involvement occurred in 38 patients (23.8%), mostly in children less than 2 years (63.1%).

Table 4 shows the frequencies of the exacerbation factors of AD. Thirty-eight patients (23.8%) recalled that their eczema was worse in the dry season and 75 patients (46.9%) that it was worse in the rainy season, while 47 patients (29.3%) could not recall any periods of relief or remission. Twenty-six patients (16.3%) referred that allergens elicit eczematous skin lesions. The most common allergens referred to aggravate AD were aeroallergens, which affected 15 patients (9.3%), being the most frequent *Dermatophagoides pteronyssinus*. Food allergens were referred from 11 patients (6.9%) and the most common food allergens were: eggs in 5 patients (3.1%) and cow milk in 4 patients (2.5%). Cow milk allergy was confirmed in 3 patients in a food challenge test performed at our hospital. It spontaneously disappeared in 100% in all patients by the age of 4. There wasn´t any correlation with the presence of allergies and the severity of the disease in our patients. Specific immunotherapy with house dust mite allergens was done in 10 of our patients (6.25%), because they had asthma. No correlation with the specific immunotherapy or the severity of the cutaneous disease could be found.

Laboratory tests, included a full blood count were not performed on all our patients. Serum IgE levels were only measured in 51 patients (31.9%). IgE levels were found to be elevated in 17 patients (33.3% of the performed laboratory tests).

The most common infective complication was bacterial infection, which occurred in 20 patients (12.5%), followed by viral infection, such as, molluscum contagiosum, which occurred in 12 patients (7.5%).

One hundred thirty-seven patients (85.6%) were treated with emollients, oral antihistamines and mild to moderate strength topical steroids. Four patients (2.5%) needed topical potent steroids to achieve control of their AD. Topical antibiotics were prescribed in 11 patients (6.9%). Short course of systemic steroids were prescribed in

Table 4: Frequency of exacerbation factors of AD.

Exacerbation factors	Number of patients	Percentages
Rainy season	75	46.9%
Dry season	38	23.8%
Aeroallergens	15	9.3%
Food allergy	11	6.9%
Unknown	47	29.3%

22 (13.8%) of patients to control acute flares. The topical calcineurin inhibitors were used in 21 (13.1%) of our patients, particularly when there was involvement of face and neck. The pimecrolimus was used in 80% of these cases and the tacrolimus was used in 20% of these cases.

Table 5 shows the number of consultations, which ranged from 1 to 10, with a mean of 2 consultations. Seventy patients (43.8%) did not require follow-up. Thirty-six patients (22.5%) are still on follow-up in the Pediatric Dermatology consultation.

Discussion and Conclusion

AD is the most common childhood inflammatory skin condition, affecting approximately 5-20% of the children worldwide [6,7]. We obtained similar findings and the prevalence of AD in our study was 17.1% [8]. However, the current prevalence of AD in our community is likely to be higher, because our study was only based on hospital outpatient data and the majority of the cases of AD are most appropriately managed within primary care.

In the literature, the vast majority of patients with AD have an onset of the disease before the age of 5 years, and the prevalence data in children show a slight female to male preponderance [6]. We obtained similar findings in that the majority of our patients (86.3%) had onset of the disease before the age of 5 years and the sex ratio was similar to other series.

AD is associated with a family or personal history of atopy. Forty-six percent of our patients had at least one first-degree family member with atopy; 49.4% had a personal history of AD alone, while 50.6% had concomitantly other atopic diseases. Our results were similar to those obtained in the study by Diepgen and Fartasch, where 47% of their patients had at least one first-degree family member with atopy, and 54% had a personal history of AD, while 46% had concomitant other atopic diseases [8,9]. Allergic rhinitis appears to be more commonly associated with AD than asthma. Moreover, in line with previous studies, the proportions of AD, asthma and allergic rhinitis in the family members of our patients, were approximately equal to the obtained in other series [9].

There are three group stages of AD: infantile (from infancy to 2 years old), childhood (from 2 years old to 12 years old) and the adult stage for those older than 12 years [6]. According to the literature, the infantile stage may present with pruritic, red, scaly and crusted lesions on the extensor surfaces, cheeks or scalp [6]. The childhood and the adult stages often demonstrate flexural distribution, particularly, in the antecubital and popliteal fossa and volar aspects of the wrists [6]. Our findings also corroborate these results.

One important difference between our study and others in the literature refers to the severity of lesions in the first presentation. While in other studies, it is predominantly moderate and severe, in our study it was predominantly mild and moderate [1,2]. This can probably be explained because we excluded the patients admitted at the urgency and included only the patients of routine consultations. The European Task Force on Atopic Dermatitis has developed the SCORAD index to create a consensus on assessment methods for AD. The SCORAD index consists of interpretation the extent of disorder (according to the rule nines; 20% of the score), the intensity composed of six items (erythema, edema/papules, excoriations, lichenification, oozing/crusts and dryness; 60% of score) and subjective symptoms (itch, sleepness; 20% of the score) [5]. The TIS score involves the scoring of erythema, edema and excoriations, in one representative lesion [5]. According to the literature, the TIS score, corresponds well with the more detailed SCORAD and can be used as a prescreening system or as quick system in studies and is excellent for epidemiologic studies [5]. Consequently, we decided to use this new and precise score to determine the severity of our patients with AD.

Table 5: Frequency of the total number of consultations.

Number of consultations	Number of patients	Percentages
1 -2	88	55%
3-4	26	16.3%
5-6	8	5%
7-8	2	1.26%
Follow-up	36	22.5%

Analogously to other reports, pruritus was the most frequently experienced symptom in our patients [1,2]. The conventional minor features of AD observed in our patients also showed agreement with previous results in literature.

There is some controversy in literature with regard to the rule of allergy in AD [4]. Some clinicians believe that allergens are a rare cause of exacerbation of AD, while others believe that allergens are a stronger factor of exacerbation of AD and, therefore, they can be related with severe AD [4]. They believe that food allergies trigger symptoms primarily in young children and environmental allergens play a greater role in older children and adults [4]. In our sample, there was no evidence of correlation between the presence of allergies and the severity of the disease. In the literature is described that approximately 33% of patients with AD have cow´s milk allergy [10] and that cow´s milk allergy spontaneously disappeared in 50%, 70% and 85% of 1, 2 and 3 years old children, respectively [10,11]. However the results differed depending on geographic region, race and diagnostic criteria [10,12]. The low cow´s milk allergy prevalence of our study (2, 5%) could be explained by the absence of the disease at the time of the consultation, which may subsequently appear [6,10].

Aeroallergens have been shown to elicit eczematous skin lesions [2]. Most common airborne allergens eliciting eczema are derived from house dust mites of the species *Dermatophagoides pteronyssinus*, which is the according with our results [2,13].

The efficacy of immunotherapy in patients with AD has been poorly investigated in the past five years [14]. The available trials have small dimension and some methodological shortcomings and/or incomplete reporting [14]. No long-term studies have been conducted to determine the disease-modifying potencial of specific immunotherapy in the context of allergic march [1,14,15]. In our study, specific immunotherapy with house dust mite allergens was done in only 10 patients of our sample (6, 25%) and there was no evidence of any relationship with the severity of AD.

Although elevation of serum IgE levels is a typical finding, approximately 20-30% of patients exhibit normal levels [6]. In our dataset, IgE levels were only measured in 31.9% of the patients and the IgE level was found to be elevated in only 33.3% of the performed

laboratory tests. This difference probably can be explained by the fact that the severity of the AD for our patients was milder than the severity of the AD for the patients of other series. Patients with mild to moderate AD have much lower (or normal) serum IgE levels compared to patients with severe AD, according to the literature [16,17].

Epidemiologic studies suggest that weather influences the prevalence of AD [18,19]. A recent study has confirmed that the change from a temperate to a subtropical climate for 4 weeks improved significantly skin symptoms and quality of life, even for 3 months after return [18]. Most our patients affected by AD improved their symptoms during the sunny summer season. Portugal is a country on the southwest side of Europe that is bordered on the south and west sides by the Atlantic Ocean and by Spain on the other two sides. Consequently the weather in Portugal is a Mediterranean temperate climate. In the winter months, in Braga, minimum temperatures are around 13 degrees Celsius on average. In the summer months, Braga has many hours of sunshine, with temperatures averaging about 27 degrees Celsius. Possible explanations for explain the seasonality of AD has been reported, including: variations in allergen exposure, disturbed barrier function of the stratum corneum and the altered cutaneous vasoreactivity in AD [19]. Moreover, ultraviolet radiation has been reported to have an antibacterial effect on the skin by a suppressive effect on superantigen production by Staphylococcus aureus [18].

AD patients are particularly prone to infections such as bacterial, viral and occasionally fungal infections [1,2]. The bacterial infections were rare in our study, occurring in 12, 5% of patients. Viral infections, such as molluscum contagiosum occurred in 7,5% of patients [8]. There wasn´t any described case of fungal infections in our patients. Again, the fact that we excluded the patients admitted at urgency with the diagnosis of AD and included only the patients of routine consultations in our study could explain the absence of complications at the time of consultation.

In many patients, including in our series, the AD is managed with careful skin care practices, topical therapies for inflammation and the elimination of exacerbating factors. Emollients are the key to restoring the defective epidermal barrier [7, 12, 16].

A prospective, randomized and double-blinded study was recently done in our hospital, to evaluate the efficacy and safety of clothing made of cellulose fibers with seaweed enriched with silver ions in the treatment of children with AD [17]. The results of the study showed that the textile clothing enriched with silver ions brings a quicker improvement of the patients in the first days, comparing to the use of standard cotton-clothes [17].

Antihistamines are widely used as a therapeutic adjunct in patients with AD to treat both pruritus and eye irritation [6]. Topical applied corticosteroids are the mainstay of therapy of AD [13]. A low potency corticosteroid cream or ointment is effective for patients with mild AD [13]. A medium potency corticosteroid cream or ointment may be needed for those with a more severe disease [13]. Higher potency topical corticosteroids can be used in some patients with acute flares, and then replaced by lower potency preparations until the lesions resolve [13]. Short term treatment (up to 1 week) with oral glucocorticoids is effective and may be an option to treat an acute flare in exceptional cases of AD [13,15]. The recommended daily dose should be adjusted to the body weight of the patient [15].

Our study used a recent score, Tis score, to determine the severity of AD and we studied the casuistic of childhood AD only in the routine consultation. We tried to illustrate the reality of our Department in Hospital de Braga, where all patients are observed in routine consultations, with different degrees of priority. The patients admitted at the Urgency of Pediatrics are then forwarded to consultation of Dermatology. Moreover, Braga was considered the European youth capital in 2012 and it has many children and adolescents and so we decided to do this study about AD in children and adolescents of Braga´s population.

In conclusion, the profile of AD in our patients was similar to that reported in the literature [2]. However, this study is a descriptive and retrospective study, with a small dimension and with lack of control groups, which limit the generalization of our results. Moreover, difficulties arise in interpreting and directly comparing results across studies because of the diverse ways in which the disease has been defined, and the differences in the study methods used in each study. Accordingly, further longitudinal studies in the community, with control groups will be necessary to clarify these issues.

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