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Epidemiological, Clinical and Therapeutic Aspects of Atopic Dermatitis in the Dermatovenerology Department of the National References University Teaching Hospital of N'Djamena (Chad): About 103 Cases

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Abstract

Introduction: Atopic dermatitis is a chronic inflammation of the skin. The diagnosis is clinical and based on the United Kingdom Working Party criterion led by Williams. The aim of this study is to contribute to the management of atopic eczema within the dermatovenerology department of the CHU-RN of N'Djamena. **Material and Method:** This was a descriptive and analytical retrospective study carried out over a period of 12 months (January 2019 to December 2019). Included were all patients diagnosed with Atopic dermatitis in the dermatovenerology department of the University Hospital Center of the National Reference of N'Djamena. Data analysis was performed with SPSS 18.0 software. **Results:** The study included 602 patients. The diagnosis of AD was retained in 38 patients with a prevalence of 6.3%. The average age was 10.84 years (0 to 25 years). A female predominance (sex-ratio F/M = 1.2). The Atopic dermatitis had started before 2 years in the 38 patients, 39.5% before 15 years and 60.5% after 15 years. Familial atopy was statistically associated with AD (P = 0.004). Inbreeding was statistically associated with Atopic dermatitis (P = 0.002). Lichenification was more represented (78.9%) followed by cutaneous xerosis. The wrists and hands were the most affected respectively in 23.7% and 21.1% of cases. The study showed bacterial superinfection in 31 patients (81%) and only 1 case (2.6%) of viral superinfection. Topical corticosteroids and emollients were used in 95% and 74% of cases respectively. Antihistamines in 92% of cases, antibiotics were necessary in 58% by local application and 29%

by the enteral route. **Conclusion:** Although the frequency is high in this study, it remains low compared to other studies, which makes it possible to classify Chad among the countries of medium prevalence. However, in-depth studies at the national level including the triggering factors will be necessary.

Keywords

Atopic Dermatitis, Prevalence, Dermatovenerology, University Hospital Center of the National Reference of N'Djamena (Chad)

1. Introduction

Atopic eczema or Atopic Dermatitis (AD) is a chronic inflammation of the skin [1]. The disease most often begins in childhood but can persist or manifest in adulthood [2]. Atopic manifestations such as asthma, rhinitis and allergic conjunctivitis are most often associated in subjects with AD or in their family [2]. It is a frequent disease in industrialised countries. It is a multifactorial inflammatory disease of the skin resulting from the interaction between genetic predispositions and environmental exposures. About 70% of patients with AD have a family history of atopy [3]. Its physiopathology involves several mechanisms including alteration of the skin barrier, the action of environmental factors, mutations of the gene coding Filaggrin as well as certain delayed hypersensitivity reactions and the role of cutaneous microbiom [4]. According to study in 2017 [5], the constitutional abnormalities of the skin barrier favor the colonization of *Staphylococcus aureus*. Thus, staphylococcal virulence factors stimulate atopic inflammation. The diagnosis of Eczema is purely clinical and is based on United Kingdom Working Party (UKWP) criteria [5] [6]. According to [6] [7], psychomotor development in atopic children is impaired by the lack of quality and quantity of sleep. Attention disorders and autism spectrum disorders are observed among Atopic dermatitis and can evolve into adulthood [7]. The relationship between AD and depressive and anxious symptoms is frequently observed [7]. The prevalence of AD in Latin America was estimated at 23% [8]; in Europe, it is evaluated between 10% and 15% [9]. In Sub-Saharan countries, there is little data available on the epidemiology of AD. According to Pefura-Yone *et al.*, 2017, AD was 2.1% in Yaoundé in Cameroon [10]. In Chad, professional experience shows that these atopic diseases are very common, but there are rarely epidemiological data on AD, making it difficult to control the impact rate. The aim of this study is to determine the epidemiological aspect, the clinical profile and the management of AD, which remains a major concern in the dermatology department of the "Center Hospitalier Universitaire de Référence Nationale" (The University of Ndjamena Teaching Hospital (CHU-RN)).

2. Methods

Type and period of study and study population

The CHU-RN, specifically the Dermato-venerology department, served as our study case. This was a descriptive and analytical retrospective study spread over a period of one year, from January 2019 to December 2019. Our target was all patients who consulted the dermato-venerology department of the CHU-RN during our defined period. All patient(s) with a complete medical record diagnosed with AD in the dermato-venerology department of the CHU-RN and all patient(s) meeting the mandatory diagnostic criteria for AD according to the UKWP were included in this study. All patients consulted outside our study period, whose medical record is incomplete and who do not meet the mandatory diagnostic criteria for AD according to the UKWP, were excluded from this study.

Criteria

Inclusion criteria

Were included: a) All patients with a complete medical file diagnosed with atopic dermatitis in the dermatovenerology department of the CHU-RN during the study period; b) any patient(s) meeting the mandatory criteria for diagnosis of atopic dermatitis according to the United Kingdom Working Party.

No-inclusion criteria

Were excluded in our study, all patients: a) Consulted outside our study period; b) whose medical file is incomplete; c) not meeting the United Kingdom Working Party mandatory criteria for diagnosis of atopic dermatitis.

Diagnostic method

The mandatory criterion for the diagnosis of AD according to the UKWP is a clinical score called SCORAD (Scoring of Atopic Dermatitis). SCORAD was developed in 1993 by a group of experts, European Task Force on Atopic Dermatitis [11]; it is made up of clinical and anamnestic data and is completed by a doctor during a clinical examination. The final score is obtained by the formula: **A/5 + 7 B/2 + C** (13) *i.e.*:

-A: extent of the affected area in percentage;

-B: the intensity of signs of inflammation of the affected areas: erythema, edema, oozing associated or not with crusts, excoriations due to scratching, lichenification. Each sign is scored from 0 to 3;

-C: the impact caused by Eczema, pruritus and loss of sleep during the last three (3) days. Each item is rated from 0 to 10.

The results will show the following:

-**SCORAD ≤ 15**: minimal DA: few inflammatory flare-ups;

-**SCORAD between 16 and 40**: moderate AD: inflammation and intense pruritus;

-**SCORAD > 40**: severe AD: extensive, inflammatory with frequent flare-ups.

Investigation method

To carry out this study, we used the medical recors of the patients and the register of the service using a pre-established sheet comprising an anamnestic part, general information on the patients, the personal and family history of atopy, the reason for consultation then a second part dedicated to the detailed clinical exam-

ination, and a last part concerning the treatment. The sociodemographic and clinico-anamnestic variables were sought.

Data entry and analysis

Data analysis was performed using SPSS software version 18.0 (Statistics Package for Social Sciences 18.0). Microsoft Excel 2010 software was used to organize the data in the form of tables and figures. Data entry was done by Microsoft Word 2010. Quantitative variables were expressed as an average and as a percentage. Qualitative variables were organized into subgroups. The results were presented as a percentage in the form of tables and figures. The Chi square test was used with a probability of $p < 0.05$ and was considered statistically significant.

Ethical considerations

The pre-established data collection sheets were anonymous and the confidentiality of the information collected was respected, then the results of the study will only be used for medical purposes. An Ethics Clearance was obtained from the National Bioethics Committee of Chad (CONBIT) under NO22/2018.

3. Results

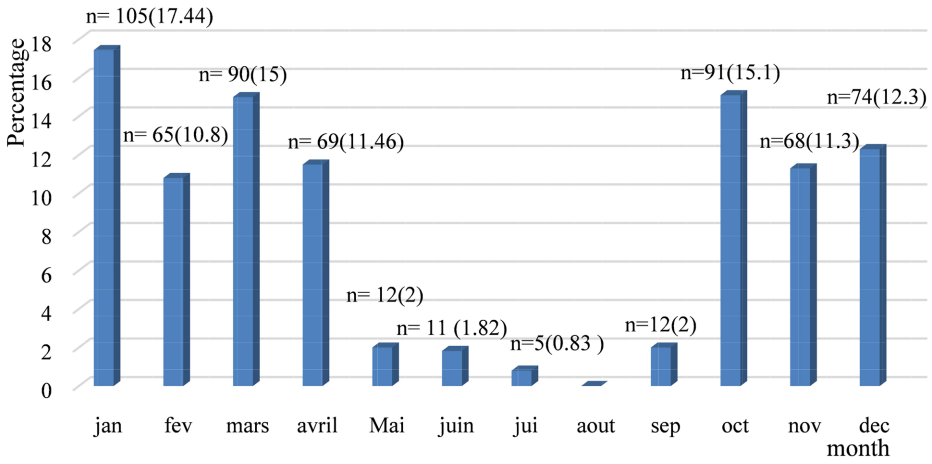
Epidemiological data

Prevalence of patients consulted during the study period

During our study period, 2322 patients were consulted, 602 were admitted for pruritus, *i.e.* 25.92%. Out of the patients admitted for pruritus, 38 met the diagnostic criteria for AD according to the UKWP, *i.e.* a prevalence of 6.31%. These 38 patients presented a compulsory criterion.

Distribution according to the consultation period

Most of the patients with pruritus (n = 602), *i.e.* 586 (97.34%) had been consulted during the months of the dry season with a peak in January and October, *i.e.* 17.4% and 15.1% respectively (Figure 1). In the city of N'Djamena, the rainy season is between June and August.



Legend: n = number of patients admitted for pruritus; **(%) =** percentage.

Figure 1. Distribution of patients according to the month of consultation.

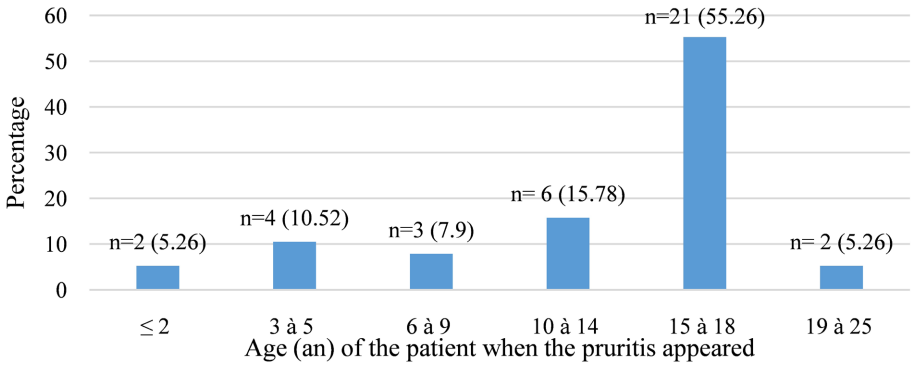
Distribution by sex

Of the 602 patients admitted for pruritus, 325 were female, or 54%, and 277, or 46%, of the opposite sex. The sex ratio is 1.17 in favor of the female sex. No statistically significant difference in rates by sex was observed with $P > 0.05$.

Clinico-anamnestic data

Distribution of positive patients by age at onset of pruritus

The 38 patients whose SCORAD is positive have an average age of 10.84 years with extremes of 0 to 25 years. The age group most affected by AD is that of [15 - 18 years], *i.e.* 55.26% (Figure 2). We also noted the presence of infants whose age is ≤ 2 years or 5.26%.



Legend: n = number of AD patients; **(%) =** percentage.

Figure 2. Distribution of AD patients according to their age at the onset of pruritus.

Table 1. Breakdown of sick patients selected by SCORAD according to whether AD is personal or family.

Personal atopy	**n**	**(%)**
Personal atopic dermatitis	4	10.52
Personal Asthma	6	15.78
Personal allergic rhinitis	12	31.57
Personal allergic conjunctivitis	7	18.42
Cutaneous Xerosis	31	82
Familial atopy	**n**	**(%)**
Family atopic dermatitis	7	18.42
Family Asthma	3	7.9
Family allergic rhinitis	15	39.47
Family allergic conjunctivitis	4	10.52

Legend: n = number of AD patients according to SCORAD; **(%) =** percentage.

Distribution of sick patients selected by SCORAD:

According to cutaneous xerosis.

According to the anamnesis, of the patients retained by the SCORAD, 31 or

82% presented with generalized skin dryness.

According to the history of personal atopy.

Among the patients, there were 29 cases of personal atopy including 10.5% history of AD, 15.8% asthma, 31.6% allergic rhinitis, 18.4% allergic conjunctivitis (Table 1).

Distribution of patients according to the consanguinity of their parents (father and mother)

During this study, the consanguinity of the parents was objectified in 180 patients (30%) (18.10% first degree and 11.8% second degree consanguinity) (Table 2).

Table 2. Distribution of patients admitted for pruritus according to the consanguinity of their parents.

Consanguinity	n	(%)
No	422	(70.1)
Degree 1	109	(18.1)
Degree 2	71	(11.8)
Total	602	(100)

Legend: n = number of patients admitted for prurit; **(%) =** percentage.

Table 3. Distribution of patients retained by SCORAD according to the appearance of the lesions, location, triggering factors, complications and treatment.

Aspect of lesions	n	(%)
Erythema	8	21.1
Scab	9	23.7
Xerosis	27	71.1
Chelite	2	5.3
Lichenification	30	78.9
Eczema	2	5.9
Localisation	**n**	**(%)**
Chin	4	10.52
Scalp	6	15.78
Neck	12	31.57
Front	7	18.42
Back	31	82
Wrist	9	23.7
Inguinal folds	7	18.42
Legs	3	7.9
Hands	15	39.47

Continued

Triggering factor	n	(%)
Not knowing	6	15.8
Heat	10	26.31
Detergent	20	52.63
Dust	2	5.26
Complications	**n**	**(%)**
Bacterial	31	81.57
Viral	1	2.63
Treatment	**n**	**(%)**
Topical corticosteroids	*36*	95
Emollients	28	74
Antihistamines	35	92
Antiseptics	20	53
Local antibiotics	22	58
General antibiotics (by general route)	27	71

Legend: n = number of AD patients; **(%)** = percentage.

Breakdown of sick patients selected by SCORAD according to dermatological analyses, complications and treatment:

According to the appearance of the lesions

The majority of patients admitted by SCORAD have lichenification-type lesions, *i.e.* 78.9%, followed by Xeroses, *i.e.* 71.1%. The least represented aspect is Cheilitis, *i.e.* 5.3%. Among the 38 patients, the bacterial complication was notified in 81.57% versus 2.63% of viral complication. The use of class 3 topical corticosteroids was systematic in 95% of cases (Table 3).

4. Discussion

The prevalence of atopic dermatitis is variable. It is generally high in Western countries and in the United States, with a prevalence that varies respectively between 15 and 23% and between 10 and 15%, according to the study by International Studies of Asthma and Allergy in Childhood (ISAAC) [8]. During the period of our study, 2322 patients had been consulted in the dermatology department of the CHU-RN. The diagnosis of atopic dermatitis was retained in 602 patients. Out of these, only 38 patients fulfilled the UKWP diagnostic criterion, *i.e.* a prevalence of 6.3%. This result is similar to those found in most African studies, including in Morocco, Karima *et al.* [12] *i.e.* 6.75%; in Benin, Atadokpede *et al.* [13] or 5.5%. However, our result is far superior to that of Pefura-Yone *et al.* [10] in Cameroon, *i.e.* 2.1% and it is slightly lower than that of Nnoruka [14] in Nigeria, *i.e.* a prevalence of 8.5%.

In our case, the majority of patients with pruritus (n = 602) had been consulted during the dry season, with peaks for the months of January, October and March (**Figure 1**). This result is contrary to that obtained by [13] in Benin, of which 43.1% were consulted during the rainy season and 21.5% in the dry season. This seasonal difference for the consultation periods could be explained by the fact that in N'Djamena, the flooding and the state of the streets during the rainy season prevent the majority of the population from coming to be consulted at the hospital. In this work, a female predominance (54%) was noted, the sex ratio F/M being 1.17. No statistically significant difference in rates by sex was observed for the diagnosis of AD with $P > 0.05$. Although our results are similar to those of several works, particularly in Africa in Benin [13], Cameroon [10], Asia, Thailand [11] and Europe, precisely in France [15], all had respectively found a predominance female, sex ratio 1.15; 1.43; 1.25 and 1.2 with 58.8%, 53.6% 55.5% and 55.4% female. Versus our results differ from those of [12] in Morocco who found rather a male predominance of 55.5%.

Anamnestic and clinical data of patients according to SCORAD

During our study, the average age of patients with AD recorded was 10.84 years with extremes of 0 to 25 years. Although the age group most affected by AD was that of [15 - 18 years] or 55.26%; we noted in our work, the presence of this condition in children ≤ 2 years, *i.e.* a prevalence of 5.26% (**Figure 2**). On the other hand, Atadokpede *et al.* [13] obtained an average age double ours, *i.e.* 20.6 years. Other studies such as that of Kharfi *et al.* [16] whose average age is half that of our survey, *i.e.* 3.2 years. Several studies have shown the presence of this pathology in both infants and adults. Thereby:

-Nnoruka *et al.* [14] in Nigeria found in their study AD in 6-week-old infants, *i.e.* 12.7% of their samples, 51.3% in children under 2 years of age and 24.5% in adults over 21 years old.

-Atadokpede *et al.* [13] in Benin reported onset of AD before 2 years in 25.7% of cases, 57.4% of cases before 12 years.

-Fatima [17] in Morocco had reported an onset of AD in 15.62% of cases before 3 months, at 3 months in 25% of cases and 59.37% of cases after 3 months.

-Fandresena *et al.* [18] in Madagascar reported onset of AD in 38% of cases before age 15 and 61.9% of cases after age 15.

All these works are similar to ours. This indicates the persistence of this condition from childhood to adulthood [19].

History of personal and family AD

Several authors have reported cases of history of AD of personal and family origin, among others in Benin, Atadokpede *et al.* [13] had reported cases of personal history of asthma, allergic rhinitis, AD, and allergic conjunctivitis respectively in 34.3%, 40.1%, 62.7% and 46% of cases, and at least one atopic manifestation in first-degree relatives, including 27.6% cases of asthma, 21.3% of allergic rhinitis, 10.4% of allergic conjunctivitis and 17.1% of AD. In Nigeria, Nnoruka *et al.* [14] had reported at least one first-degree relative with AD in 16.7% of cases,

14.6% with asthma, 10.3% with allergic rhinitis and 2.1%. In Tunisia, Anis *et al.* [19] reported a family history of atopy in 41.6% of patients.

These results, although different in their proportions, show that AD could well have a personal or family origin. This is also the observation of our work (Table 1):

-Patients with personal AD, including 15.78% of cases of asthma, 31.57% of allergic rhinitis, 18.42% of allergic conjunctivitis and 10.52% of AD;

-And others whose AD is familial with 18.42%, 7.9%, 39.47% and 10.52% for AD, asthma, allergic rhinitis and allergic conjunctivitis respectively.

The difference in the different rates is significant between the two groups (personal and family) with P = 0.004.

From our study, patients with AD reported as triggers dust in 5.26%, 26.31% heat and 52.63% detergents (Table 3). According to the literature, the predominance of detergents could be explained by the fact that the high number of women using more dish-washing detergents.

In Western literature, the consanguinity factor has not been studied because of the scarcity of this type of marriage in their context. In Africa, among others in Morocco for Karima [12] and Fatima [17] respectively 14.8% and 37.5% of patients with AD were from consanguineous marriage. The first proportion is clearly lower versus the second is comparable to our result which is 30% (18.1% degree 1 and 11.8% degree 2) (Table 2) of patients from a consanguineous marriage. This difference in consanguinity could be explained by the fact that in our country Chad and in most African countries where the Muslim religion is present, consanguineous marriage is observed.

Appearance, location and complications of lesions

In accordance with the literature [2] [12] our survey showed the dominance of two types of lesions, lichenitis and xerosis (Table 3) with respectively 78.9% and 71.1% of cases. Cheilitis was the least observed aspect, *i.e.* 5.3% of cases. According to several works [2] [11] [13]-[15] [20] the dominance of these types of lesion could be explained by the fact that the African population is mostly young and does not go to hospital quickly.

[15] had reported the location of the lesions as 49.3% at the elbow, 42.3% at the face, 34.7% at the knee and 17.9% at the wrist. For [21] 75% of localization is in the face; [12] and [18] had reported the majority of locations on the cheeks (faces) with 90% and 92.3% respectively. Comparable to the work of [14] and [22] localization to the face represented 42.1% in our work, to the back 18.4% of cases, 2.6% to the inguinal folds, 2.6% to the feet, 21 .1% on the hands and 23.7% on the wrists (Table 3).

In several studies [11] [13] [14] [15] as in our case (Table 3) the complication of AD is of bacterial origin. Although the complication of viral origin is present but at proportions ≤ 4%. This domination of the bacterial complication would find its explanation by the fact that in most studies (African) as well ours is that general hygiene is low in Africa.

Therapeutic data

There is no standard protocol in the management of AD [15] [18] [23]-[26].The basis of management depends on the appearance and the evolutionary state of the lesions. The goal of treatment is to quickly achieve remission with an attack treatment [22] [23] [25]. In our work, class III topical corticosteroid ointments were used in 95% of cases (**Table 3**). The therapeutic strategy was one application per day, *i.e.*: Diprosone ointment: 1 application/day. This therapy was comparable to most work in Africa as well as Europe. Thus in Morocco [12] and [18] had used topical corticosteroids in the push phase respectively in 75% and 72.2% of cases. In Tunisia and Nigeria respectively [17] and [14] used topical corticosteroids in 83.3% and 84.8% of cases. More recently in Europe and specifically in France in 2018, [20] reported 97% of topical corticosteroid cases were used. Emollients constitute a basis in the treatment of AD because they restore skin barriers and limit skin dryness [17] [25] [27]-[31]. In our study, 74% of our patients were put under a local treatment with emollients. As in our study Pefura-Yone *et al.* in Cameroon [10] noted the use of emollients in 75.5% of cases. Versus in Europe, Meylan [24] in Sweden reported the use of emollients in 85% of cases. Pruritus in AD is not related to histamine [25], which explains the low efficacy of antihistamines. Their systematic prescriptions are prohibited. Except in cases of severe pruritus, their prescriptions will be undertaken but for a short period [32]. This was the case in our study, which were prescribed in 92% of cases. In Tunisia [21] noted the general use of antibiotics in 54.2%. Compared to our survey (**Table 3**) 58% of patient cases had benefited from antibiotics and 53% from antiseptic-based treatment.

5. Conclusion

Although the frequency is high in this study, it remains low compared to other studies, which makes it possible to classify Chad among the countries of medium prevalence. The age of onset in our context is later than observed in other studies. There is a relationship between certain factors and the occurrence of AD for familial atopy. The most marked clinical aspect is that of chronic lesions (lichenification). In-depth studies at the national level including the triggering factors will be necessary.

Authors' Contributions

All the authors contributed to achievement of this work and to the drafting of the manuscript. All authors have read and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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