Clinical Patterns of Alopecia Areata in Children in South Jordan

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ABSTRACT

Objective: To describe the clinical patterns of alopecia areata in a group of children in Al-Karak City in the South of Jordan.

Methods: This study was conducted at Prince Ali Ben Al-Hussein Hospital in Al-Karak City during the period June 2011 to May 2012. Patients who presented with alopecia areata and were aged less than 14 years old were included in the study. The diagnosis of alopecia areata was based on clinical grounds and was made by two expert dermatologists. All patients underwent a thorough history and physical examination. Age, gender, age of onset, type of alopecia, extent and duration of the disease, presence of specific signs, associated medical or dermatological conditions and nail involvement were recorded for all patients. Simple statistical analysis (frequencies, means and percentages) was used to describe the study variables.

Results: A total number of 58 pediatric patients were included in the study. There were 31 male and 27 female with a ratio of 1.1:1. The age of patients ranged from two to 14 years. The age of onset ranged from one to 13 years (mean = 7 years).The most common age of presentation was in the age group four to eight (34.5%) and eight to 12 (32.8%). Most patients (77.6%) presented with limited alopecia areata, and 22.4% of patients presented with widespread alopecia areata. The majority of patients (77.6%) presented with primary alopecia areata and 22.4% of patients presented with recurrent alopecia areata. The mean duration of the disease was three months. Patients with primary alopecia areata had a median duration of two months while those with recurrent alopecia areata had a median duration of four months. Atopic dermatitis was found in 5 patients, vitiligo in one patient and thyroid disease in one patient. Severe alopecia areata was noted mainly in male patients (25.9%), younger age groups (66.7% of patients in the age group 0 to 4), patients with recurrent alopecia areata (60%), patients who had ophiasis (87.5%) and in all patients who had nail abnormality. Alopecia areata occurred in 5.9%, 0.6% and 0.2% of first, second and third degree relatives of patients respectively.

Conclusion: There was a slight preponderance for male gender in pediatric alopecia areata in South Jordan. Most patients had limited alopecia areata. Severe alopecia areata is associated with male gender, younger age of onset, recurrent alopecia areata, presence of ophiasis and presence of nail involvement. Patients with recurrent disease tend to have a longer duration of their disease. Relatives of patients have a higher frequency of alopecia areata which indicates the important role of genetic factors.

Key words: Alopecia areata, Clinical patterns, South of Jordan

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Introduction

Alopecia areata (AA) is a chronic disorder of the hair follicles characterized by patches of non scarring hair loss.[1,2] It affects both genders equally and there is no known race preponderance.[1] Approximately 1.7% of the population will experience an episode of AA during their lifetime.[3]

The etiology of AA has been attributed to a combination of genetic predisposition and environmental factors. Family history of AA has been reported in eight to 20% of patients.[4,5] An inflammatory lymphocytic infiltrate surrounding the hair follicle is the main histological feature seen in AA. Abnormal differentiation of hair follicle causes breakage of the hair and consequently hair loss.[6]

AA is considered an autoimmune disease due to the association with multiple HLA antigens including HLA-DR4, HLA-DR5, and HLA-DQ3.[7] Expression of these HLA antigens promotes T-cell recognition of follicular antigens.[7-9] The underlying pathogenesis of AA involve antibody mediated cellular immunity. The inflammatory infiltrate consists of CD4+ lymphocytes around the hair follicle is and a CD8+ lymphocytes inside the follicle.[10] Antibodies against the anagen phase hair follicle have been detected in up to 90% of patients with AA versus 37% of controls.[11] It has been shown that the targets of immune attack are the precortical keratinocytes and melanocytes of the hair bulb.[12]

Clinically AA presents in three major forms: patchy disease (AA), extensive scalp involvement Alopecia totalis (AT) and extensive body involvement Alopecia universalis (AU).[2] Patchy AA may affect, in addition to the scalp, any hair-bearing skin such as the beard, eyebrows and other parts of the body. Nail involvement (nail pitting) has been reported in up to 40% of children with AA.[13,14]

There is no data on childhood AA in Jordan. This study was conducted to describe the clinical patterns of AA in children in the Al-Karak area of Jordan.

Methods

This study was conducted at Prince Ali Ben Al-Hussein Hospital in Al-Karak in the South area of Jordan during the period between June 2011 and May 2012.

Patients who were 14 years old or less and presented with AA were included in the study. The diagnosis of AA, defined by the presence of patchy, non scarring areas of hair loss, was based on clinical grounds and was made by two expert dermatologists. Patients who showed inflammatory signs or scaleness of their lesions were excluded from the study. A total number of 58 patients were enrolled in the study.

AA investigational assessment guidelines published by Olsen *et al.* were adopted to assess the extent of the disease; Hair loss was classified as < 50% (S1–S2) involvement, 50% to 99% (S3–S4) involvement, Alopecia totalis (AT), and Alopecia universalis (AU).[15] We considered S1-S2 involvement as limited AA and S3-S4 involvement, AT and AU as severe AA. Severity of AA in relation to age of onset, primary versus recurrent disease, presence of ophiasis and nail involvement was assessed in this study. Family history and presence of AA in the first, second and third degree relatives was also described.

Simple statistical analysis (frequencies, means and percentages) was used to describe the study variables.

Results

The most common age of presentation was in the age group four to eight (34.5%) and eight to 12 (32.8%). The age of onset ranged from one to 13 years and the mean age of onset was 7 years. Age of onset in most patients (39.7%) was between four to eight years. Limited AA, defined as less than 50% involvement of the scalp, was found in 77.6% of patients. Extensive AA, defined as > 50% involvement, AT or AU, was found in 22.4% of patients. Limited AA was found in 74.2% of male patients and in 81.5% of female patients. On the other hand, severe AA occurred in 25.9% of male patients and in 18.5% of female patients.

Primary AA occurred in 77.6% of patients with equal incidence in males and females. The median duration of the disease was three months. Patients with primary AA had a median duration of two months while those with recurrent AA had a median duration of four months.

Ophiasis was detected in 13.7% of patients and nail pitting in15.5% of patients. With regards to

Table I: Clinical data of the patients

Age (year)	Male: n=31 (%)	Female: n=27 (%)	Total: n=58 (%)
0-4	3 (9.7)	2 (2.4)	5 (8.6)
4-8	11 (35.5)	9 (33.3)	20 (34.5)
8-12	8 (25.8)	11 (40.7)	19 (32.8)
12-14	9 (29.0)	5 (18.5)	14 (24.1)
Age of onset (year)			
0-4	5 (16.1)	4 (14.8)	9 (15.5)
4-8	12 (38.7)	11 (40.7)	23 (39.7)
8-10	9 (29.0)	7 (25.9)	16 (27.6)
10-14	5 (16.1)	5 (18.5)	10 (17.2)
Extent of AA at time of presentation			
S1 – S2* (< 50%)	23 (74.2)	22 (81.5)	45 (77.6)
S3 – S4** (50-99%)	3 (9.7)	3 (11.1)	6 (10.3)
AT^ (Alopecia Totalis)	3 (9.7)	1 (3.7)	4 (6.9)
AU^^ (Alopecia Universalis)	2 (6.5)	1 (3.7)	3 (5.2)
Ophiasis	7 (22.6)	1 (3.7)	8 (13.7)
Primary Vs Recurrent AA			
Primary	24 (77.4)	21 (77.8)	45 (77.6)
Recurrent	7 (22.6)	6 (22.2)	13 (22.4)
Associated nail abnormalities	6 (19.4)	3 (11.1)	9 (15.5)
Associated diseases			
Atopic dermatitis	3 (9.7)	2 (7.4)	5 (8.6)
Vitiligo	1 (3.2)	0 (0.0)	1 (1.7)
Thyroid	1 (3.2)	0 (0.0)	1 (1.7)

* S1–S2: < 50% involvement, ** S3–S4: 50% to 99% involvement, ^ AT: Alopecia totalis, ^^ AU: Alopecia universalis

Table II: Severity of AA in relation to different factors (n=58)

Age of Onset (year)	S1-S2*(%)	S3-S4**(%)	AT^(%)	AU^^(%)	Total (%)
0 – 4	3 (5.2)	2 (3.4)	2 (3.4)	2 (3.4)	9 (15.5)
4 – 8	18 (31.0)	2 (3.4)	2 (3.4)	1 (1.7)	23 (39.7)
8 – 10	14 (24.1)	2 (3.4)	0 (0.0)	0 (0.0)	16 (27.6)
10 – 14	10 (17.2)	0 (0.0)	0 (0.0)	0 (0.0)	10 (17.2)
Type of AA					
Primary	39 (67.2)	2 (3.4)	1(1.7)	1(1.7)	43 (74.1)
Recurrent	6 (10.3)	4 (6.9)	3 (5.2)	2 (3.4)	15 (25.9)
Ophiasis	1 (1.7)	2 (3.4)	2 (3.4)	3 (5.2)	8 (13.9
Assoiated nail abnormalities	0 (0.0)	2 (3.4)	4 (6.9)	3 (5.2)	9 (15.5)

* S1–S2: < 50% involvement, ** S3–S4: 50% to 99% involvement, ^AT: Alopecia totalis, ^^AU: Alopecia universalis

Table III: Occurrence of AA among relatives of patients

	Number of Subjects	Number having AA (%)
First degree relatives	389	23 (5.9)
Second degree relatives	1151	7 (0.6)
Third degree relatives	2131	4 (0.2)

associated diseases: atopic dermatitis was found in five patients, vitiligo in one patient and thyroid disease in one patient. Details of the clinical data of the patients are shown in Table I.

Severe AA was noted mainly in younger age groups; 66.7% in the age group zero to four, 21.7% in the age group four to eight and 12.5% in the age group eight to 12 had severe AA. Male patients tended to have more severe disease: severe AA occurred in 25.8% of male patients versus 14.8% of female patients. Also, severe AA occurred in 9.3% of patients with primary AA and in 60% of patients with recurrent AA. Severe AA affected 87.5% of patients who had ophiasis and all patients who had nail pitting. Details are presented in Table II.

Table III illustrates the occurrence of AA in patients' relatives. It was 5.9%, 0.6% and 0.2%

in first, second and third degree relatives of patients successively. Control group showed a frequency of 0.3 %, 0.1% and 0.1% of AA in first, second and third degree relatives respectively.

Discussion

AA is a common hair disorder[3] encountered in daily dermatologic practice. It has been reported that the majority of AA cases (up to 60%) develop during childhood,[16,17] and children are at a 10-fold risk of developing AA compared to the general population.[18] To our knowledge there is no data on AA in pediatric patients in Jordan.

The male to female ratio in our study showed a slight preponderance of male gender, which is consistent with other studies from India, China and Portugal.[19-21] There is no agreement in different reports about which gender is affected more by AA. In a report from a neighboring country Kuwait, girls outnumbered boys by a 2.5:1 ratio.[22] The same female preponderance has been reported in other countries.[16,23]

The mean age of onset was 7 years old, which is higher than 5.7 years old reported in a similar study from Kuwait.[22] However it was lower than 11.2 years old in another report.[4] In our study we found that early age of onset was associated with the severe type of AA. This finding is consistent with other reports from different parts of the world.[4,16,19,23]

The majority of patients (77.6%) had limited AA. This finding is nearly similar to other reported rates. In Kuwait limited disease occurred in 80.5% of patients[22] and in reports from Singapore, North India, China and Portugal limited AA occurred in 82.1%, 76%, 84.9% and 82% of patients respectively.[19-23]

As for patients with recurrent AA we noticed that in our series patients tend to have longer duration. Similar finding have been reported from China.[19] It has been reported that ophiasis occurs in 1.7% of patients.[24] However, we detected a higher rate of ophiasis (13.9%) in our patients this can be partly explained by the fact that we gave more attention to detect this important finding or it may be due to severe disease type in this area or due to certain genetic factors. Patients with ophiasis showed a significant tendency to have severe disease, 87.5% had severe AA. Associated nail disease occurred in 15.5% of our patients which was consistent with some reports,[13,16] however another study showed lower prevalence of nail involvement.[24] All patients with associated nail disorder had severe AA. The higher incidence of sever AA in patients who have recurrent disease, ophiasis and nail changes is probably due to more active and more aggressive disease and may be associated with a stronger autoimmune reactions in these patients. Despite the fact that antifollicuar autoantibodies are reported in up to 90% of patients with AA,[11] it is not known if the titer of these antibodies is related to the disease activity or severity.

AA has been reported to be associated with other diseases, mainly atopy, vitiligo and thyroid abnormalities. In our study atopic dermatitis, vitiligo and thyroid disease were detected in 8.6%, 1.7% and 1.7% of patients respectively. The rate of atopy in our patients was lower than rates of atopy reported in India (18%) and in Pakistan (20%).[20,24] On the other hand, the rate of atopy in our study was higher than the 0.88% reported in China.[19] In our study we looked for the presence of atopic dermatitis only while in the other studies atopy included asthma and allergic rhinitis in addition to atopic dermatitis. This may account for our finding of lower rate of atopy, but may also be due to the variations of rates of atopy in different studies. Our finding of 1.7% associated thyroid abnormality is generally consistent with reports from China and India.[16,19,20] However, it was lower than that in studies from Singapore (2.3%) and Pakistan (4.3%).[13,24] Milgraum *et al*. reported 24% of children aged less than 16 years with AA to have abnormal thyroid function tests and/or elevated thyroid microsomal antibody levels. The reported rates of associated vitiligo were 0.4% in China,[19] 4.1% in Singapore[13] and 3.5% in Pakistan.[24] Despite of the fact that there is an increased overall risk of other autoimmune diseases (16%) in patients with AA;[26,27] the frequency of occurrence of different autoimmune diseases in AA is variable from one study to another due to lack of reliable statistics based on prospective studies of large numbers of patients. Some authors[27,28] recommend that patients with severe, recurrent or chronic AA are to be screened for atopy, thyroid diseases, anemias and

other autoimmune disorders. However, in our view blood tests are not indicated if a child with AA is in good health with no evidence on history and physical examination of associated disorder. This is also the view of the most recent guidelines from the British Association of Dermatologists.[1] It is painful for the child and a waste of health resources.

Positive family history in pediatric AA has been documented in several studies from all over the world (Singapore the reported rate is: 8.4%,[23] Pakistan: 10%,[24] Portugal 10%,[21] China: 11%,[19] India: 12.4%[20] and in Kuwait: 51.6%[22]). In our study, AA occurred in: 5.9%, 0.6% and 0.2% of first, second and third degree relatives of patients respectively. This concur mostly with rates reported in a study from China[19] where the prevalence of AA in first, second, and third-degree relatives of the probands were 2.87%, 0.40%, and 0.13%, respectively. However, rates of prevalence of AA in relatives of our patients were lower than rates reported in other studies. For example, in study with a *larger* sample size (348 patients) 16% of participants had a first-degree relative who had AA.[18] In another study with a *smaller* sample size (36patients), AA was detected in 13.9% of first- degree relatives, in 4.2% of second-degree relatives and in 1% third-degree relatives. In a small study involving 36 probands, the risk to first-degree relatives was the highest (13.9%), followed by second degree (4.2%), and third-degree relatives (1%).[25] So positive family history is well documented in various studies but there is a discrepancy in the reported rates of positive family history and this is may be due to the variation of genetic background among different races, also variation in the numbers of patients in different studies may also result in such differences. The risk of AA was highest in first degree relatives and it becomes less in more distant relatives. This pattern is similar to other multifactorial diseases, so we agree with other authors[19] that both genetic and environmental factors are important in the expression of the disease.

Limitation of the study

Further analytical studies with larger number of pediatric patients with AA from clinics at Royal Medical Services to determine important predictor factors of disease severity are needed.

Conclusion

We found that there is slight preponderance for male gender in pediatric AA and most patients had limited AA. Severe AA is associated with male gender, younger age of onset, recurrent AA, presence of ophiasis and presence of nail involvement. Patients with recurrent disease tend to have longer duration of their disease. Relatives of patient have a higher prevalence of AA which indicates the important role of genetic factors.

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