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Case Series

Assessment of prognostic markers of alopecia areata in pediatric patients

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ABSTRACT

Alopecia areata (AA) is associated with impairment of psychological health being more pronounced in pediatric population. Hence, it becomes imperative to study the AA in pediatric population so that early diagnosis and adequate treatment can be initiated at early stage to prevent further morbidity associated with the condition. This observational study was conducted in the department of dermatology venereology and leprosy, SAIMS and PG institute, Indore, India after obtaining approval from the IEC. The study included 14 children with AA who visited the hospital over the period of 1 year. Results showed that Mean age of the patients was 8.8±3.423 years with M:F ratio of 3:4. AA subtotalis was found to be most frequent (57.1%). The mean duration of alopecia was reported to be 9.3±7.965 months. The most common finding was the presence of a single patch (35.7%) and 50% of subjects have had a single episode of the disease. 64.3% of children had involvement of multiple sites with scalp being the most common (85.7%). There is high prevalence of markers of disease severity and activity amongst pediatric patients with AA. High prevalence of nail changes, mark hair (64.3%), coudability hair (50.0%), yellow dots (42.8.0%), black dots (78.6%), S. vellus hair (28.6%) shows that children have high chance of AA progressing to severe forms. There is high prevalence of markers of disease severity and activity amongst pediatric patients with AA with AA subtotalis more common among children as compared to the patchy type.

Keywords: AA, Pediatric, Prognostic markers

INTRODUCTION

Alopecia areata (AA) is an autoimmune disorder characterized by acute onset non-scarring hair loss which usually involves the scalp.[1-3] Concomitantly, the involvement of other parts of the head, eyelashes, and beard can also be seen.[4] Hair loss usually occurs in sharply defined areas ranging from small patches to extensive or less frequently diffuse involvement.[3]

AA presents with relapsing and remitting hair loss patches with the potential to progress into severe subtypes such as alopecia totalis (AT), alopecia universalis (AU), or alopecia ophiasis (AO).[2]

On dermoscopy, the patients with AA show black dots, yellow dots, broken hairs, tapering hairs, and clustered short vellus hairs (shorter than 10 mm) in the areas of hair loss. Black and yellow dots and short vellus hair are indicative of disease severity and black dots, tapering hairs, broken hairs, and short vellus hairs are indicative of disease activity. The most sensitive markers for diagnosis of AA include yellow dots and short vellus hairs and most specific markers include black dots, tapering hairs, and broken hairs.[5,6]

AA has an unpredictable prognosis. Recovery can be expected in 34%-50% of patients whereas in 14%-25% progression to AT or AU is seen. Factors associated with

poor prognosis include a family history of AA, young age at onset, nail dystrophy, extensive hair loss, ophiasis, a history of atopy, or the presence of other autoimmune diseases.[1]

It has been estimated that the overall pooled prevalence of AA is 2.11%[7] and the overall prevalence of pediatric AA is 0.11%.[8] Amongst children, it is the third most common dermatologic disease and presents with a lifetime risk of 1%-2%. The incidence of AA does not vary between males and females. However, male patients are more likely to develop the disease in childhood, and female patients are more likely to get diagnosed in adolescence.[1] AA and its subtypes are associated with significant impairment of psychological health. Psychological detriments are more pronounced amongst the pediatric population.[2] People with AA often feel anxious, depressed, disabled, and isolate themselves socially.[3,9] Thus, it becomes more important to study the AA in pediatric population so that early diagnosis and adequate treatment can be initiated at early stage to prevent further morbidity associated with the condition. Therefore, in the present study clinical profile of paediatric patients has been studied.

CASE SERIES

Study design, study population, sample size, sampling technique

This observational study was conducted in the department of dermatology venereology and leprosy, Sri Aurobindo medical college and PG institute, Indore, India after obtaining approval from the institutional ethics committee. The study included 14 children with AA who visited the hospital over the period of 1 year (from November 2021 to November 2022).

Methodology

The information related to age, gender, and duration of disease was recorded. History of associated diseases such as diabetes, psychiatric disorders, thyroid disease, atopic dermatitis, vitiligo, and other autoimmune disorders and association with any chromosomal abnormality like Down syndrome was obtained and family history was also recorded. A clinical examination was done to assess the type of AA, the sites involved, and the presence of nail changes. Dermoscopy and trichoscopy were performed to evaluate markers of AA such as mark hair, coudability hair, yellow dots, black dots, S. vellus hair, and white hair spared. The presence of associated diseases and family history were also checked.

Data were analyzed using SPSS (Statistical package for social sciences) 25.0 version, IBM, Chicago. Descriptive statistics were performed. The chi-square test was used to assess the association between different variables. $P<0.05$ was considered statistically significant.

Clinical data

The study included 14 patients aged 3-14 years. The mean age of the subjects was 8.8±3.423 years. All except one child were found to have early onset (at age less than 13 years) alopecia. Male: female ratio was 3:4 (6 males and 8 females). AA subtotalis was found to be more frequent compared to the patchy type [8 (57.1%) vs 6 (42.9%)]. The mean duration of alopecia was reported to be 9.3±7.965 months (range=1 to 24 months). The most common finding was the presence of a single patch [5 (35.7%)] (Figure 1) and most of the subjects have had a single episode of the disease [7 (50.0%)] [Figure 1]. A description of the involvement of various sites has been done in Figure 1. Involvement of multiple sites was noticed in most of the children [9 (64.3%)], the most commonly involved site was the scalp [12 (85.7%)]. Five (35.7%) children were having a history of associated diseases which included malaria [1 (7.1%)], atopic dermatitis [1 (7.1%)], atopy [2 (14.2%)], hypertrichosis [1 (7.1%)] and intellectual disorder [1 (7.1%)]. Five (35.7%) children were having a positive family history which included a history of DM in grandparents, AA in maternal aunt, atopy in sibling, and vitiligo in sibling.

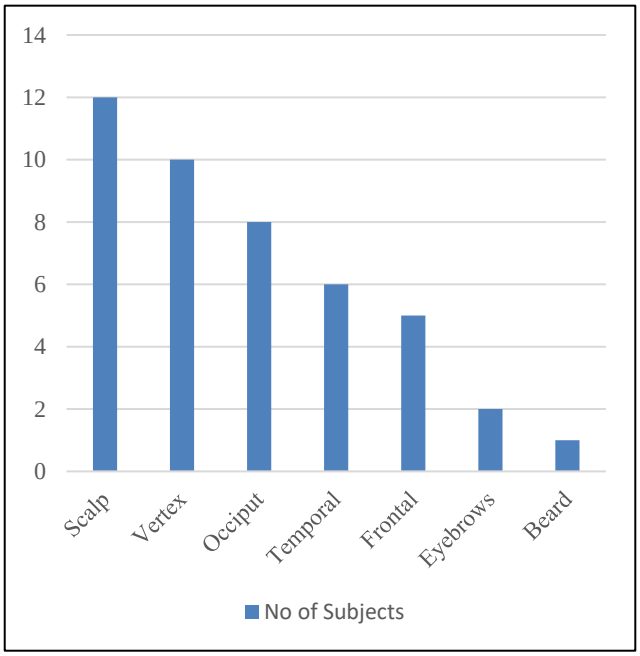

Figure 1: Distribution of study subjects based on involvement of various sites.

Trichoscopy findings

In patients with AA, the most common trichoscopy feature was a black dot [11 (78.6%)]. The presence of exclamation mark hair was the second most common finding [9 (64.3%)] (Figure 2). On comparing the presence of various markers of disease severity and activity between children with AA subtotalis and AA patchy, it was found that coudability hair has a significant association with patchy AA (Figure 2).

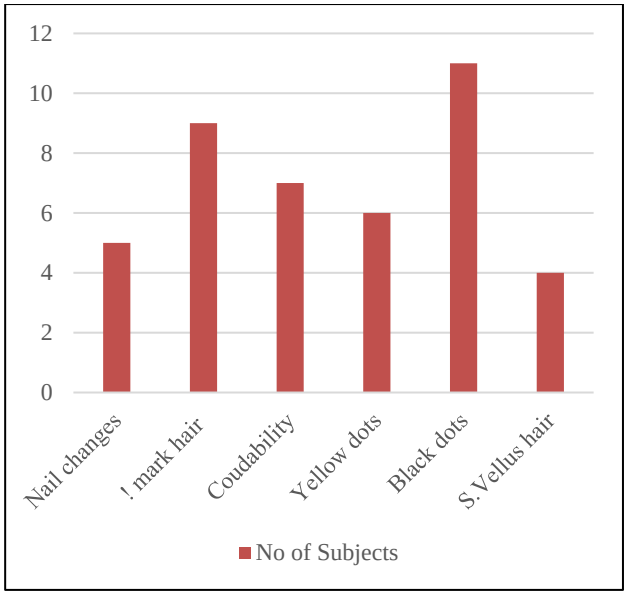

Figure 2: Distribution of study subjects based on dermoscopic and trichoscopic findings.

Amongst the children having AA along with a history of associated diseases such as atopic dermatitis/atopy/ hypertrichosis/malaria/intellectual disorder the prevalence of various markers was as follows: Nail changes (37.5%), mark hair (62.5%), coudability hair (25.0%), Yellow dots (50.0%), Black dots (75.0%), S. vellus hair (37.5%).

Amongst the children having AA along with a family history of AA/Atopy/vitiligo/diabetes mellitus the prevalence of various markers was as follows: Nail changes [1 (20.0%)], mark hair [5 (100.0%)], coudability hair [2 (40.0%)], yellow dots [3 (60.0%)], black dots [5 (100.0%)], S. vellus hair [1 (20.0%)]. No significant association was found between the family history/associated disease history and markers of disease severity and activity ($p>0.05$). However, mark hair was found to have a significant association with family history ($p<0.05$).

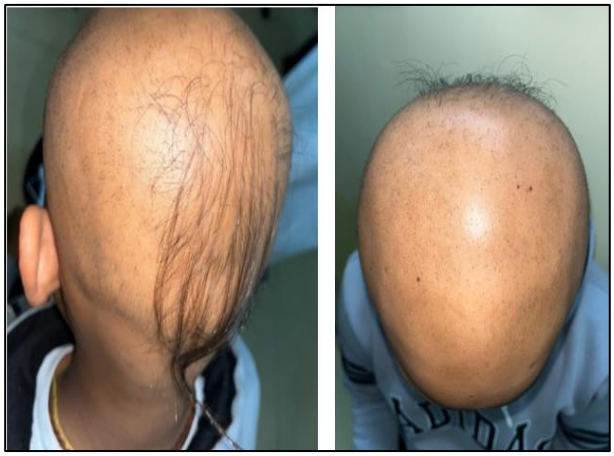

Figure 3: Alopecia areata: subtotalis pattern.

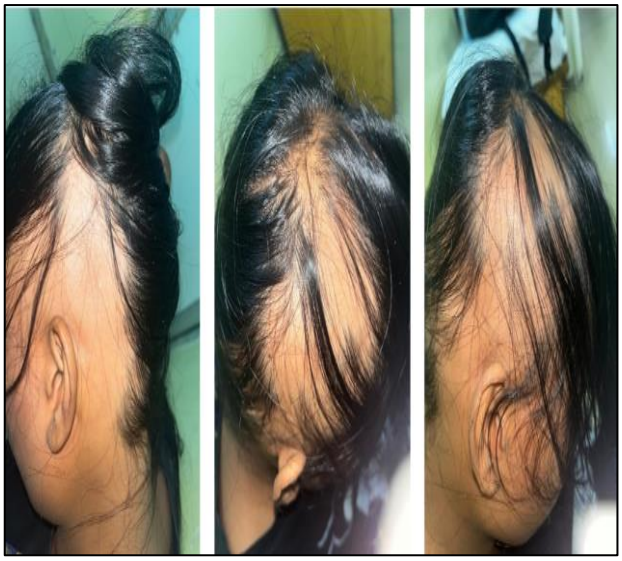

Figure 4: Alopecia areata: ophiasis pattern.

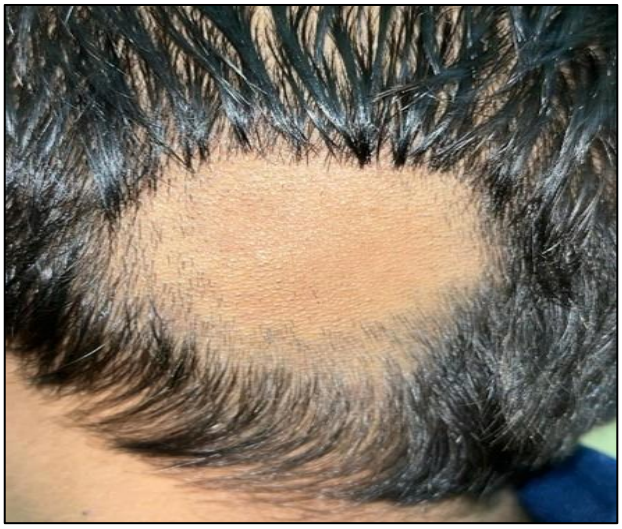

Figure 5: Alopecia areata: patch pattern.

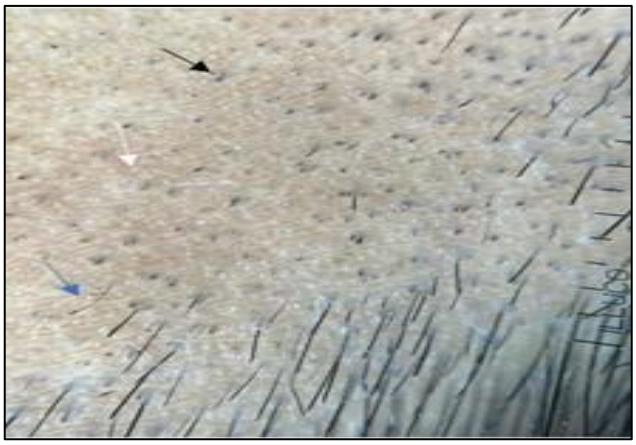

Figure 6: Dermoscopy of alopecia areata patch demonstrating of poor prognostic markers.
Black arrow: black dots; white arrow: white dots; Blue arrow:- hair.

Table 1: Distribution of study subjects based on involvement of various sites and dermoscopic and trichoscopic findings.

Variables	N	Percentage (%)
Sites involved		
Scalp	12	85
Vertex	10	71.4
Occiput	8	57.1
Temporal	6	42.8
Frontal	5	35.7
Eyebrows	2	14.2
Beard	1	7.1
Dermoscopic and trichoscopic findings		
Nail changes	5	35.7
Mark hair	9	64.2
Coudability	7	50
Yellow dots	6	42.8
Black dots	11	78.5
S. vellus hair	4	28.5
White hair spared	3	21.4

DISCUSSION

AA is a multifactorial disease with a variable prognosis.[3] In a similar study done by Harsimran et al in our institute most of the findings were in concurrence with present study except that they evaluated 24 patients in age group 0-16 years with mean age 10.4 years as compared to present study with 14 participants in age group 3-16 years with mean age 8.8 years.[10] They reported that AA can occur at any age with 6/22 patients having early onset (13 years). Whereas in our study only 1 patient had early onset. Family history was positive in 2 (0.08%) patients which was seen in the early onset group as compared to present study with positive family history in 35.7% of patients such that amongst 21.4% parents or grandparents had a history and in 14.3% siblings were having history. 50% of male patients showed severe AA and 66% females had severe forms of AA. More than usual cases of severe forms of AA were seen in this study as compared to the patch type AA (which is the most common type of AA). However, in the present study the most common finding was the presence of a single patch. Further, they also described the various forms of nail changes with 49.7% of severe AA patients reporting same which in our study was not undertaken.

The prevalence of AA amongst males and females has been reported to be almost similar.[1] In our study sample, the number of male and female children was almost similar. This was in concurrence with study done by Harsimran et al.[10] There is no clear conclusion whether the disease varies according to sex but some studies suggest a male predominance.[11,12]

We have found presence of atopic dermatitis in one child. Wei et al have suggested bidirectional association between AA and AD, due to common pathogenic mechanism.[13] This finding emphasizes importance of follow-up and screening AA patients for AD and vice versa.[13]

Positive family history can be found in 10-20% of patients of AA.[14] We have found positive family history in 35.7% of patients such that amongst 21.4% parents or grandparents had a history and in 14.3% siblings were having history. This was in contrast with results obtained in a study done by Harsimran et al and Lee et al.[10,15]

Amongst various markers of AA, nail changes are commonly seen among children and adults. Lipner et al have reported that nail changes can be present in as high as 66.0% of patients with AA whereas the average prevalence is nearly 30.0%.[16] We have found nail changes in 35.7% of children presenting with AA. Nail changes in patients with AA are indicative of progression to AA subtotalis.[16] In study, frequency of occurrence of nail changes has been found to be high amongst patients with subtotalis compared to those with patchy AA, although the difference was statistically non-significant.

Exclamation mark hair is the prime diagnostic feature of AA.[17] Our study showed the presence of exclamation mark hair amongst 64.3% of subjects.

Black dots also known as comedo-like cadaver hairs are indicative of disease activity of AA and are found in nearly 50% of the patients with AA. Black dots result due to the abrupt halt of the hair cycle caused by an autoimmune-mediated inflammatory process affecting the bulb region of anagen follicles.[18] In our study, we found black dots in 78.6% of subjects. Yellow dots represent dilated follicular infundibulum filled with keratotic material and/or sebum. These are seen in more than 60.0% of the patients.[19] Abd-Elaziz El-Taweel et al have found black dots (60.0%) to be the most prevalent trichoscopic finding followed by yellow dots (55.0%).[20]

In our study, we have found yellow dots in 42.9% of subjects. The slightly less prevalence than expected can be attributed to the pediatric age group considered in our study as yellow dots are less common in prepubescent patients.[19] Our study has reported short villus hair in 28.6% of subjects whereas Abd-Elaziz El-Taweel et al reported the prevalence of short villus hair to be 40.0%. Other markers of disease activity and severity such as White hair spared [3 (21.4%)] and coudability [7 (50.0%)] have been reported to occur in high frequency amongst such children.[20]

The major limitation of the present study is the small sample size as with the low incidence of AA, the number of cases of AA visiting the hospital was less.

CONCLUSION

There is high prevalence of markers of disease severity and activity amongst pediatric patients with AA. High

prevalence of nail changes, mark hair [9 (64.3%)], coudability hair [7 (50.0%)], yellow dots [6 (42.8.0%)], black dots [11 (78.6%)], S. vellus hair [4 (28.6%)] shows that children have high chance of AA progressing to severe forms. AA subtotalis is common among children compared to the patchy type.

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