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Original Research Article

Clinical and dermoscopic patterns of childhood alopecia areata in a tertiary care centre in North India

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ABSTRACT

Background: To describe the clinico epidemiologic profile and dermoscopic findings in children with alopecia areata (AA) and correlate the dermoscopic findings with stage and severity.
Methods: The present study was performed over a period of six months, from July 2020 to December 2020 in a tertiary care hospital where 50 clinically diagnosed children ≤15 years with AA were enrolled. A thorough clinical examination followed by dermoscopy was performed. The results were tabulated and then analyzed statistically.
Results: The mean age of presentation was 9.74 years. The most common site involved was scalp and the most common dermoscopic findings were yellow dots (25/50, 50%), short vellus hair (22/50, 44%), black dots (21/50, 42%), exclamation mark hair (15/50, 30%) and broken hair (11/50, 22%).
Conclusions: No significant associations was found between dermoscopic findings and severity or stage of childhood alopecia areata. There was a significant correlation of alopecia areata severity with nail findings in children with alopecia areata.

Keywords: Dermoscopy, Yellow dots, Black dots

INTRODUCTION

Alopecia areata (AA) is the most common immune mediated nonscarring alopecia caused by a T-cell-mediated autoimmune destruction of hair follicles.[1] The life time incidence of AA is approximately 2% worldwide and it has no sex predominance.[2] AA is considered as a disease of all age group; however, most patients present at age of 21–40 years. It is the third-most common dermatosis in children and approximately 20% of all AA cases occur in infancy.[3] The characteristic dermoscopic features in AA include black dots (BDs), yellow dots (YDs), exclamation mark hairs (EHs), and broken hairs (BHs).[4] There is a variation in dermoscopy findings depending on the stage, site, and severity of the disease.[4] This study aims to describe the clinico epidemiologic profile and dermoscopic findings in children with alopecia areata.

METHODS

The observational study was conducted from July 2020 to December 2020 at the Dermatology out patient department of a tertiary care center in North India. We enrolled 50 consecutive children (age ≤15years) of Alopecia areata in our study. Based on pattern and extent of hair loss, AA was classified as patchy, ophiasis, sisaipho, reticular, alopecia totalis and universalis. After obtaining informed consent from all patients, their demographic details, duration of disease, and associated complaints were recorded. A detailed personal and family history was recorded with special emphasis on atopic and endocrine disease. A thorough clinical examination to

assess number, site, morphology and distribution of alopecia patches, and presence of nail changes was performed, along with photographic documentation. Dermoscopic examination was done in all children using a Dermlite DL3N Dermoscope (3Gen, Inc.; San Juan Capistrano, California) with polarized mode of magnification x10. Severity of AA was evaluated using severity of alopecia tool (SALT).[5] Scalp hair loss ranged from S1 to S5 (S0=no hair loss; S1=less than 25 percent hair loss; S2=26%–50% hair loss; S3=51%–75% hair loss; S4=76%–99% hair loss; S5=total scalp hair loss). The loss of body hair ranged from B0 to B2, where B0 represents no loss, B1 some loss, and B2 complete loss. The overall grading included both scalp and body hair loss. General systemic examination and serum biochemistry were conducted to rule out thyroid dysfunction, vitamin D deficiency and anemia. The results were tabulated and analyzed statistically using Statistical package for social sciences (SPSS) Software 25.0 version. For calculating frequencies and finding correlation between different variables, Chi square test, Fisher's exact test, and Spearman rank correlation test were used. Results were considered significant if $p<0.05$.

RESULTS

Among the 50 children with alopecia areata, mean (SD) age was 9.74 years with a female: male ratio of 1.08:1.

Most of the children (58%) belonged to 10-15 year age group, while there were only five children below 5 years. Majority of our patients presented within 2 months of developing the disease, while the disease persisted for maximum 5 years in one patient. Regarding associated diseases, thyroid disorder in form of hypothyroidism was the commonest at 16% while atopic disorders (atopic dermatitis, bronchial asthma, and allergic rhinitis) and vitiligo were recorded in 12% and 2% respectively. A positive family history of AA was obtained in 5 (10%) patients but was not statistically significant. The demographic and clinical data are presented in Table 1.

Scalp was the commonest site involved in our study (41/50, 82%) with 38 patients showing isolated scalp involvement while 3 children showed additional eyebrow involvement. Isolated eyebrow involvement was seen in 3(6%) cases. Alopecia universalis was seen in 6 children (12%). According to the pattern of scalp involvement, 78.04% (32/41) had circumscribed patchy involvement, 12.19% (5/41) had alopecia totalis while ophiasis pattern was seen in 7.31% (3/41) patients and one child had reticular pattern out of total 41 patients of scalp involvement. (Figure 1 and 2) The distribution of patients according to different patterns of scalp involvement is shown in Figure 3. According to the SALT score, 54% percent (n=27) of patients scored Grade S1 severity in scalp AA, 2% (n=1) scored Grade S2, 8% (n=4) scored Grade S3, and 10 % (n=5) scored Grade S5. Grading of body hair loss, which included all body parts other than the scalp, scored 76% (n=38) of patients in Grade B0, 12 % (n=6) in Grade B1, and 12% (n=6) in Grade B2. The majority of the patients (54%, n=27) belonged to the Grade S1B0 group. Nail involvement was present in 13 (26%) children. The commonest pathology was pitting (9/13, 69.2%) followed by thinning (4/13, 30.7%).

Table 1: Clinical and demographic data of patients with Alopecia areata in the study.

Parameters	No. of patients (n=50)
Gender distribution	M: F=1:1.08
Males	24 (48%)
Females	26 (52%)
Age distribution (years)	mean=9.74 yrs
Minimum age	3.5
Maximum age	14
Duration of disease	mean=13.31 months
Minimum	6 days
Maximum	5 years
Number of children with nail changes	
Pitting	9 (18%)
Thinning of nail plate	4 (8%)
Number of children with associated findings	
Thyroid dysfunction	8 (16%)
Atopic disease	6 (12%)
Family history of alopecia areata	5 (10%)
Vitiligo	1 (2%)

Table 2: Comparison of dermoscopic findings in children in Alopecia areata in various studies.

Dermoscopic finding	Present study n=50	Rakowska et al[12] n=102	Anna et al[14] n=50	El-Tawell et al[15] n=20	Amer et al[16] n=20	Moneib et al[13] n=34
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Yellow dots	50	37	52	55	60	91
Short vellus hair	44	20	70	40	40	94
Black dots	42	42	40	60	75	59
Exclamation mark hair	30	36	44	55	45	44
Broken hair	22	5	54	40	25	59

Figure 1: (A) Clinical photograph of Single patch of Alopecia areata in a 5 year old child and (B) Clinical photograph showing Ophiasis pattern of Alopecia areata in a 6 year old female child.

Figure 2: Alopecia universalis in 12 year old child.

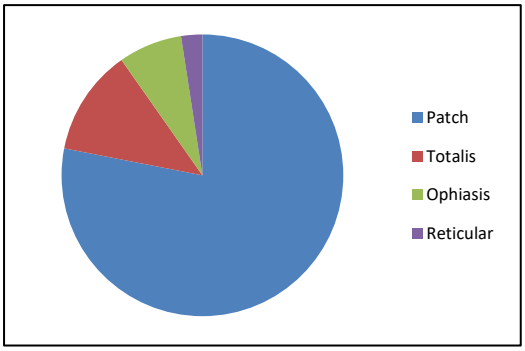

Figure 3: distribution of patients according to different patterns of scalp involvement.

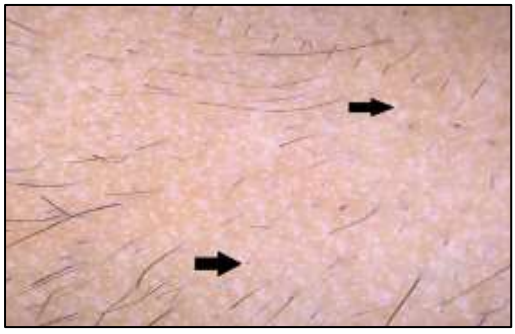

Figure 4: Dermoscopy in a child with alopecia areata, presenting with black dots (black arrow).

Figure 5: Dermoscopy in a child with alopecia areata, presenting with small vellus hair (white arrows) and pigtail hair (black asterix).

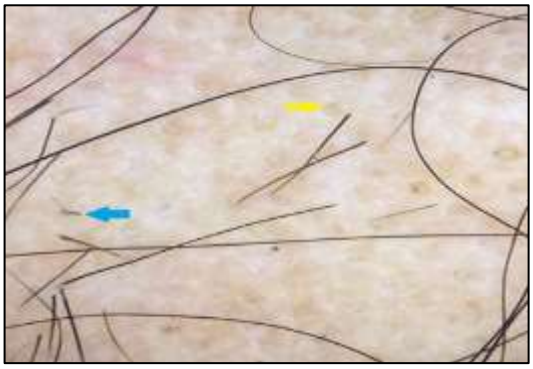

Figure 6: Dermoscopy in a child with alopecia areata showing broken hair (blue arrow) and yellow dot (yellow arrow).

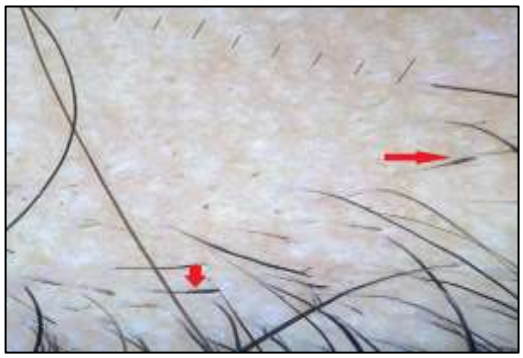

Figure 7: Dermoscopy in a child with alopecia areata showing exclamation mark hair (red arrow).

On dermoscopy, the commonest findings were yellow dots (25/50, 50%), short vellus hair (22/50, 44%), black dots (21/50, 42%), exclamation mark hair (15/50, 30%) and broken hair (11/50, 22%). The less common dermoscopic findings included pig tail hair, perifollicular scaling and coudability sign in four patients each while telengiectasia and kinked hair were noted in two patients each. There was no statistical association between the dermoscopic findings and pattern/severity of alopecia

areata in our patients. The various dermoscopic signs seen in our study are depicted in Figures 4-8.

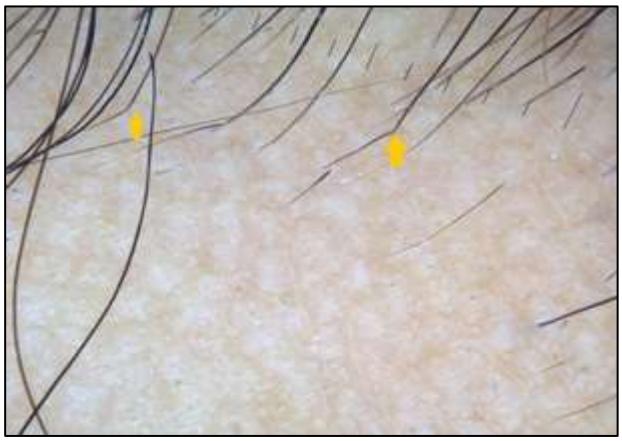

Figure 8: Dermoscopy in a child with alopecia areata showing coudability sign (yellow arrow).

DISCUSSION

Alopecia areata is a common problem encountered by the dermatologist. Though it is a benign condition, it can exert tremendous emotional and psychological impact on the patients. It is estimated that the risk for AA occurring in children is around 10X greater than that in the general population.[6] There are very few studies on the dermoscopic patterns in children with AA. The youngest patient in the current study was 3.5 year-old and the eldest being 14-year-old. The majority of patients in our study belonged to the age group between 10 and 15 years old (58%). The average age of onset of disease in our study was 9.74 years old. This was slightly higher from a similar study done in Kuwait (6.7 years) but similar to a study done in paediatric population in Singapore (11.2 years) and in Chennai (10.18 year).[6-8] Our study showed a slight female preponderance of 26 females as compared to 24 males (F:M ratio of 1.04:1). In the study from Chandigarh, out of total of 201 patients, female:male ratio was 1.39:1.[9] In study done by Nanda et al on 215 patients, female: male ratio was 2.44:1 and study by Naveen et al had F:M ratio 1.4:1.[6,7] A positive family history of AA was obtained in 5 (10%) patients in the current study. Studies done in China and Singapore showed results of 11.06% and 12.4% respectively which were consistent with our study results.[8,10] In our study hypothyroidism, atopic disorders and vitiligo were seen in 16%, 12% and 2% of children respectively. A study from Chandigarh showed 10.7% of their patients with AA having autoimmune thyroiditis.[9] In studies done in Kuwait there were 3 (1.4%) patients, China 1 (0.44%), and Singapore 1 (0.33%) patients who had vitiligo along with AA.[7,8,10] The data from the national alopecia registry in USA reports the disease most commonly associated with alopecia areata was atopic dermatitis (32.7%).[3] Alopecia totalis and universalis made up 6.19% children in study by Xiao, and 16.9% in the Chandigarh study while our study had alopecia totalis in 10% and there were 12% cases of alopecia universalis.[9,10] The commonest site involved in our study was the scalp (82%) which corresponded to studies done in Chandigarh (80.6%) but less than the studies in Chennai (97.43%) and Kuwait (96.3%).[6,7,9] The next commonly affected site in other studies were the eyebrows, then the eyelashes which is similar to our study. Nail involvement in our study was observed in 26% children in form of pitting (69.2%) and thinning of nails. We had no patient with twenty nail dystrophy. Naveen et al reported nail changes in 38.46%, with fine pitting being the most commonly observed change present in 73.3%.[6] The data from National Alopecia Registry, recorded 43.8% of the children with some nail involvement with pitting being the most common in 85.9% and 11.2% had 20 nail dystrophy.[3] In our study the nail changes revealed a significant association with the severity of the disease which was similar to the observations in previous studies.[7,9]

In the present age, Dermoscopy has established itself as an indispensable tool in the diagnosis and follow up of alopecia areata. In AA, dermoscopy of active disease shows YDs, broken hair and exclamation mark hairs. YDs represent distention of the affected follicular infundibulum with keratinous material and sebum.[11] In a study conducted by Rakowska et al, YDs were seen in 36.2% (37/102) of cases in contrast to Moneib et al study where 91% cases with AA had YDs.[12,13] Anna Waśkiel-Burna et al reported an incidence of 52% among 50 patients.[14] The incidence of YDs in our study was 50%. This low incidence in our study may be attributed to the skin color of our patients which might make the YDs difficult to perceive. Exclamation marks hairs are characterized by wider diameter in the distal shaft and thinner diameter in the proximal shaft. This is because of the lymphocytic inflammatory infiltrate affecting the hair bulb and produces a thinner hair shaft.[11] We noted EMH in 30% cases which was consistent with the previous studies by Rakowska et al, Anna et al and Moneib et al.[12-14] The presence of SVHs indicates the nondestructive nature of AA, allowing hair regrowth whether or not it results in completely mature hair shafts.[11] The pigmented hairs of Asians facilitate the detection of SVHs by dermoscopy. In the present study, SVH was seen in 44% of the patients, similar to El Tawell et al and Amer et al.[15,16] BDs which represent pigmented hairs broken or destroyed at scalp level are a sensitive marker not only for disease activity, but also for the severity of AA.[11] In our study, BDs were seen in 42% of cases which is similar to the result of Rakowska et al (42%) and Anna et al (40%) but lower than Amer et al (75%) and Moneib et al (59%).[12,14,16] BHs, considered to be dystrophic hairs produced by the least severely affected follicles in AA, are clinical markers of the disease activity and severity.[11] Amer et al demonstrated BHs in 25% of alopecia cases and 8% patients had BH in the study conducted by Bhardwaj et al.[16,17] BHs were seen in 28 patients (37.33%) in our study similar to Amer et al who had BH in 25% patients.[16] In various studies done in childhood alopecia, BH varies from 5% by Rakowska et al to 59% by Moneib et at.[14] The

comparison of dermoscopic signs in various studies on childhood alopecia is tabulated in table 2.

The different dermoscopic signs can be used for differential diagnosis, severity assessment and activity in AA. BDs and EMHs are the most specific findings in AA and correlate well with disease activity, whereas YDs are seen in all the stages of the disease and correlate with disease severity.[4] The aim of our study was to evaluate the dermoscopic features of AA in childhood alopecia and correlate these features with disease patterns and severity. To conclude the most common dermoscopic features were yellow dots, short vellus hair and black dots, followed by exclamation mark hair and broken hair. However we could not find any correlation between disease severity/ stage and dermoscopic signs.

Limitations

One limitation of our study was the small cohort size. More studies need to be done in this field using larger sample sizes. Another limitation of our study was the lack of control group, unequal distribution of patients according to clinical types and SALT score.

CONCLUSION

In our study the nail changes revealed a significant association with the severity of the disease but there was no statistical significant relationship observed between various dermoscopic signs and severity and pattern of childhood alopecia. More dermoscopy based studies need to be done in childhood alopecia in Indian population in a large sample size to have a better understanding of the relationship between dermoscopic signs and severity of AA.

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Ethical approval: The study was approved by the institutional ethics committee

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