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Original Article

Alopecia areata: Dermatoscopic differences between pediatric and adult patients

Qasim S. Al Chalabi, Haitham B. Fathi*, Mohammed N. Al Mallah*

Department of Medicine, College of Medicine, University of Mosul. Iraq
* Department of Medicine, College of Medicine, University of Nineveh. Iraq

Abstract

Objective To compare and analyze the dermatoscopic features of alopecia areata and its association with the severity of the disease, clinical patterns, and nail involvement between children and adults.

Methods A multi-center cross-sectional study was conducted in the Departments of Dermatology at Al-Salam and Ibn Sena Teaching Hospitals, Mosul, Iraq. During the period from Oct. 2021 to Oct. 2022. Ninty-sex children and 171 adult patients with alopecia areata were examined and assessed by dermatoscope, and the findings were recorded, evaluated, and tabulated.

Results Pediatric alopecia areata was more common in females (M: F 1:1.6) while adult males were more likely to have the disease (M: F 1.7:1). The mean age (±SD) of the presentation was of 9.7±3.3 years for children and 29.9±9.8 years for adults. Multiple patches of alopecia areata were found in 59.3% of pediatric patients and 68.4% of adult patients, while the reticular type was the least common variant among children and adults. Yellow dots (81.2%) were the most frequent trichoscopic sign in children followed by short vellus hairs (71.8%), compared with adults who showed short vellus hairs (68.4%) followed by yellow dots (66.6%). Upright hairs in the S1 grade were more found in adults than in children, while yellow dots were seen in children more than adults in the S2 grade. However, short vellus hairs and exclamation mark hairs showed significant changes among adult patients in the S3 group. Broken hairs were more common among children cases in the S4 group. Yellow dots, exclamation mark hairs, and triangular hairs were correlated with severe clinical variants in adults. While in children only broken hairs were correlated with severe clinical patterns of alopecia areata. Nail involvement was associated with severe forms of the disease (p-value <0.05) in children and adult patients.

Conclusion Yellow dots and broken hairs were the most common dermatoscopic finding in children. In adult patients, short vellus hairs were the most frequent sign followed by yellow dots. Nail changes were correlated with disease severity in both adults and children.

Key words
Alopecia areata; Yellow dots; Dermatoscopy; Pediatric.

Introduction

Alopecia areata (AA) is one of the commonest non-scarring hair loss caused by autoimmune destruction of the hair follicle.[1] About 1.7% of the population had the disease at some point in their life and both sexes are equally affected, while the prevalence of AA was documented between 0.1% to 0.2% and it begins in the early three decades of life,[2] the frequency of AA among children (below 16 years) consists of about 20% of the cases,[3-5] but other research had shown much lower result at 5%.[6]

Alopecia areata is usually diagnosed on clinical bases as a well-demarcated oval or round patch of hair loss with apparent smooth normal skin with exclamation point hair at the periphery of

Address for correspondence
Dr. Mohammed N. Al Mallah
Department of Medicine, College of Medicine,
University of Nineveh. Iraq
Email: mohammed.sedeeq@uoninevah.edu.iq

the lesions, non-pigmented hairs can be found scattered through the lesion.[1] 10–44% of AA patients had nail changes and it is considered one of the poor prognostic factors.[7]

Alopecia areata can be presented as several clinical patterns, patchy, multiple patches (>3), reticulate, ophiasis, sisaipho, alopecia totalis (AT), or alopecia universalis (AU).[7]

Dermatoscopy is a useful diagnostic tool that helps to assess many dermatological disorders,[8,9] one of them is AA.[10,11] Many trichoscopic characteristics are found in AA that are already documented in other studies such as yellow dots (YDs), black dots (BDs), exclamation mark hairs (EHs), Broken hairs (BHs), short vellus hairs (SVHs), triangular hairs (THs), upright regrowing hairs (URHs) and others markers.[12-15]

Several trichoscopic signs were reported and associated with the severe and active form of AA.[12,14] However, few workers tied these dermatoscopic findings between pediatric and adult patients of AA.[13,15] Few numbers of research comparing dermoscopic manifestations of AA between children and adults were conducted in Iraq. Therefore, this study was conducted to determine and compare the trichoscopy features of AA between children and adults and their association with disease severity, clinical patterns, and nail involvement.

Patients and methods

The current study is a multi-center cross-sectional study conducted in the Departments of Dermatology at Al-Salam and Ibn-Sena Teaching Hospitals, Mosul, Iraq, during the period from the 1st of October 2021 to the 1st of October 2022. The mean age of presentation was of 9.7±3.34 years for children and 29.9±9.8 years for adults. Two hundred sixty-seven patients with AA were enrolled in the study after providing informed consent (96 children and 171 adults). Complete medical and dermatological examinations were done for all cases including a modified hair pull test and the disease was considered active if more than 10% of hairs were removed after a repeated gentle pull from the sides of each patch of hair loss, while stable disease defined as less than 10% of hairs removed after a repeated gentle pull from the sides of each patch of hair loss. Patients with vague clinical diagnoses and, cicatricial hair loss were excluded from this study.

Based on SALT scoring system,[16] AA severity was graded as S1 (>25% scalp hair loss), S2 (26-50% scalp hair loss), S3 (51-75% of scalp hair loss), S4 (76-99% scalp hair loss), lastly, S5 (total scalp hair loss). Body hair loss was divided into either B1 (partial loss of body hair loss) or B2 (total loss of body hair). While nail involvement was categorized into either N0 (absence of nail involvement) or N1 (presence of nail involvement). Then AA was subdivided into five clinical variants as follows: single patch; multiple patches (<3); ophiasis, AT; and AU. and detect the dermatoscopic markers for each clinical pattern.

Each patient of AA was examined by Skiary Smartphone Dermatoscope©, photos were taken and evaluated, then dermatoscopic findings were recorded, evaluated, and tabulated.

The age of the patients and duration of AA were presented as mean±SD, while the rest of the categorical data were presented as percentages. A comparison of differences in proportional data between children and adults was performed using a z-score test for two population proportions. The association of different dermatoscopic findings with clinical patterns and SALT scoring was performed using Chi-Square test and spearman`s correlation rank test. The data were processed using the statistical

package IBM© SPSS version 26. *p*-value below 0.05 is considered significant.

Results

Ninety-six child and 171 adult patients with AA enrolled in the current study. Male children encounter 36 (37.5%) cases of pediatric patients while female children represented about 60 (62.5%) cases. The sex ratio was 1:1.6. On the other hand, adult males represented 109 (63.7%) cases while women encountered 62 (36.25%) patients, with a male-to-female ratio was 1.7:1. The duration of the disease (mean) was 11.6 months for children (disease duration was less than six months in 68 (70.8%) patients) and 23 months for adults (disease duration was less than six months in 117 (68.4%) patients).

Child and adult patients who suffered from multiple patches of AA represented the highest percentage. While the reticular variant was the least percentage in both groups. The other clinical forms of AA are shown in **Table 1**.

Table 1 Distribution of the patients according to the clinical patterns, SALT scoring system, disease activity, and trichoscopic findings.

Parameters	*Pediatric (n=96)*	*%*	*Adult (n=171)*	*%*	*P-value*
Clinical patterns					
Localized	34	35.4%	51	29.8%	0.3
Multiple	57	59.3%	117	68.4%	0.1
Reticular	4	4.1%	9	5.2%	0.6
Ophiasis	15	15.6%	25	14.6%	0.8
Sisaphio	10	10.4%	8	4.67%	0.06
Alopecia totalis(AT)	15	15.6%	30	17.5%	0.6
Alopecia universalis(AU)	15	15.6%	15	8.77%	0.08
SALT scoring					
S1	24	25%	54	31.5%	0.2
S2	24	25%	54	31.5%	0.2
S3	18	18.7%	18	10.5%	0.06
S4	15	15.6.%	30	17.54%	0.6
S5	15	15.6%	15	8.7%	0.08
B1	10	10.4%	38	22.2%	0.01*
B2	15	15.6%	15	8.7%	0.08
N0	73	76%	123	71.9%	0.4
N1	23	23.9%	48	28.1%	0.4
Disease activity					
Active	65	67.7%	122	71.3%	0.5
Stable	31	32.2%	49	28.6%	0.6
Dermoscopic findings					
Black dots (BDs)	48	50%	75	43.8%	0.3
Yellow dots(YDs)	78	81.25%	114	66.6%	0.01*
Broken hairs (BHs)	74	77%	93	54.3%	0.002*
Exclamation marks (EHs)	45	46.8%	72	42.1%	0.4
Short vellus hair (SVHs)	69	71.8%	117	68.4%	0.5
Upright regrowing hairs (URH)	18	18.75%	45	26.3%	0.1
Coudability hairs (CHs)	28	29.1%	47	27.4%	0.7
Triangular hairs (THs)	33	34.3%	45	26.3%	0.1
Pigtail hairs (PTHs)	20	20.8%	44	25.7%	0.3
Telangiectasia (T)	41	42.7%	92	53.8%	0.08
Perifollicular scales (PS)	17	17.7%	35	20.4%	0.5

**p*-value less than 0.05 is considered significant.

Figure 1 Pigtail hairs (red arrows), upright regrowing hairs (white arrows).

Figure 2 Exclamation mark hair (blue arrow), black dot (red arrow)

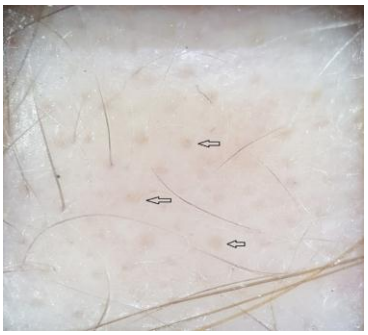

Figure 3 Yellow dots (black outlined arrow) in a 10-year-old girl.

Twenty-five percent of pediatric patients had S1 and S2 severity according to SALT scoring system also 31.5% of the adult patients suffered from S1 and S2 severity. The distribution of the patients according to SALT scoring system is shown in **Table 1**. Nearly two-thirds of both pediatric and adult patients suffered from active disease.

The most common dermoscopic finding of children was YDs followed by BHs. However, in adults, SVHs were the most frequent sign followed by YDs. The least frequent dermoscopic finding in both children and adults was perifollicular scales. The frequencies of YDs and BHs in children were significantly (p-value < 0.05) higher than that reported among adult patients. The rest of trichoscopic findings are shown in **Table 1**. The dermoscopic markers of AA are seen in **Figures 1-3**.

YDs and BHs were correlated with disease severity in pediatric patients. While in adults, YDs, EHs, and THs were associated with the severity of the disease. Other dermatoscopic findings were excluded because they did not show a significant association as shown in **Table 2**. Regarding the correlation between dermatoscopic markers and AA clinical variants. The authors found that YDs and, EHs were correlated with severe clinical patterns in adults. while in children YDs and, BHs were correlated with severe clinical variants of AA (p-value >0.05). SVHs had a negative association with the severe subtypes in pediatric patients. THs correlate (p-value<0.05) with severe clinical

Table 2 The association of trichoscopic signs and SALT scoring system between pediatric and adult patients.

Severity of AA		*Trichoscopic findings*						
		BDs *N(%)*	*YDs* *N(%)*	*BHs* *N(%)*	*EHs* *N(%)*	*SVHs* *N(%)*	*URHs* *N(%)*	*THs* *N(%)*
S1	Children(N=24)	18 (75.0%)	12 (50%)	24 (100%)	12 (50%)	21 (87.5%)	3 (12.5%)	6 (25.0%)
	Adults(N=54)	21 (38.8%)	21 (38.8%)	21 (38.8%)	9 (16.6%)	36 (66.6%)	12 (22.2%)	15 (27.7%)
S2	Children(N=24)	6 (25.0%)	24 (100.0%)	15 (62.5%)	9 (37.5%)	22(91.6%)	9 (37.5%)	15(62.5%)
	Adults(N=54)	21 (38.9%)	42 (77.8%)	39 (72.2%)	24 (44.4%)	39 (72.2%)	24 (44.4%)	9(16.6%)
S3	Children(N=18)	9 (50.0%	12 (66.7%)	12 (66.7%)	6 (33.3%)	16 (88.8%)	6 (33.3%)	9(50%)
	Adults(N=18)	15 (83.3%)	12 (66.7%)	15 (83.3%)	12 (66.7%)	18 (100.0%)	9 (50.0%)	12(66.6%)
S4	Children(N=15)	6 (40.0%)	15 (100.0%)	12 (80.0%)	12 (80.0%)	9 (60.0%)	0	3(20%)
	Adults(N=30)	6 (20.0%)	24 (80.0%)	12 (40.0%)	18 (60.0%)	24 (80.0%)	0	6(20%)
S5	Children(N=15)	9 (60.0%)	15 (100.0%)	6 (40.0%)	6 (40.0%)	0	0	3 (20%)
	Adults(N=15)	12 (80.0%)	15 (100.0%)	6 (40.0%)	9 (60.0%)	0	0	0
	p-value							
	Children(N=96)	0.3	0.001*	0.001*	0.6	0.3	0.1	0.2
	Adults(N=171	0.6	0.001*	0.6	0.001*	0.2	0.4	0.03*

BDs: Black dots; YDs: Yellow dots; BHs: Broken hairs; EHs: Exclamation mark hairs; SVHs: Short vellus hairs; URHs: Upright regrowing hairs; THs: Triangular hairs.
**p*-value less than 0.05 is considered significant.

Table 3 The dermatoscopic findings and their correlation with the clinical variants of AA between pediatric and adult cases.

Dermoscopic findings	*Localized patchy # children(n=34) adults(n=51)*	*Multiple patchy# children(n=57) adults(n=117)*	*Ophiasis # children(n=15) adults(n=25)*	*Totalis # children(n=15) adults(n=30)*	*Universalis children(n=15) adults(n=15)*	*p-value*
BDs						
Child	18 (52.9%)	21(36.8%)	2(13.3%)	6 (40.0%)	9 (60.0%)	0.3
Adult	21 (41.1%)	43 (36.7%)	6(24%)	6 (20.0%)	12 (80.0%)	0.8
YDs						
Child	12 (35.2%)	51(89.4%)	7(46.6%)	15 (100.0%)	15 (100.0%)	0.001*
Adult	21 (41.1%)	78 (66.6%)	11(44%)	24 (80.0%)	15 (100.0%)	0.001*
BHs						
Child	24 (70.5%)	39 (68.4%)	5 (33.3%)	12 (80.0%)	6 (40.0%)	0.04*
Adult	21 (41.1%)	66 (56.4%)	7 (28%)	12 (40.0%)	6 (40.0%)	0.2
EHs						
Child	21 (41.1%)	27 (47.3%)	6 (40%)	12 (80.0%)	6 (40.0%)	0.3
Adult	9 (17.6%)	54 (46.1%)	8 (32%)	18 (60.0%)	9 (60.0%)	0.001*
SVHs						
Child	18 (52.9%)	39 (68.4%)	6 (40%)	9 (60.0%)	0	0.01*
Adult	27 (52.9%)	81 (69.2%)	10(40%)	24 (80.0%)	0	0.3
URHs						
Child	3 (8.3%)	15(26.3%)	3 (20%)	0	0	0.2
Adult	12 (30.8%)	45 (38.4%)	8 (32%)	0	0	0.2
THs						
Child	6 (17.6%)	24 (42.1%)	6 (40%)	6 (40%)	3 (20%)	0.7
Adult	15(29.4%)	30 (25.6%)	7 (28%)	3 (20%)	9 (60%)	0.01*

BDs: Black dots; YDs: Yellow dots; BHs: Broken hairs; EHs: Exclamation mark hairs; SVHs: Short vellus hairs; URHs: Upright regrowing hairs; THs: Triangular hairs. **p*-value less than 0.05 is considered significant. # Patient with more than one clinical pattern

variants in adult groups, while URHs correlate negatively with disease severity in both groups but are statistically not significant **(Table 3)**.

Nail involvement was seen in 23 (23.9%) child patients. Nail changes in children were pitting found in 15 (65.2%) patients, trachyonychia in 5 (21.7%) patients, and, longitudinal striation was only seen in 3 (13%) patients. Forty-eight (28.1%) adult cases were associated with nail changes, nail pitting was found in 31 (64.5%) patients, trachyonychia in 9 (18.7%) patients and longitudinal ridging was only seen in 8 (16.6%) patients. Nail changes were correlated with disease severity in both adults and children with a *p*-value <0.0001.

Discussion

In the present study, most of the pediatric patients were female (M: F 1:1.6); however, in the adult group, males were predominant (M: F 1.7:1). These findings were also documented by other studies.[4,5,11,12,17]

The mean age of children was 9.7 years, which goes parallel with previous studies[3,4,18] while in adult patients was 29.9 years, this result was higher than other studies[11-13] since children's ages were not included in the adult group in the current study.

In this study, disease duration was less than 6 months in nearly 71% of pediatric patients, this result was identical to a study in Singapore[18] but it is slightly higher compared to other studies conducted in Kuwait[4] and Bangal,[5] in adults, the duration of illness was less than 6 months in 68.4% of patients, this result is similar to Nikhil *et al*.[19] These results had no statistical difference between the adults and children's groups.

About 70% of pediatric and adult cases suffered from a progressive disease in the current study, this result is somehow similar to other studies.[19]

In the current study, YDs were the most common dermatoscopic finding (81%) in children patients and, statistically differed from adults and indicated a severe disease and negative predictive feature according to Lima *et al.*[20] and Bapu *et al*.[21] Waśkiel-Burnat *et al*;[22] considered YDs the least frequent trichoscopic marker among children (due to the underdevelopment of the sebaceous gland before puberty), however, in this study, the age of pediatric patients was older than Waśkiel-Burnat *et al.*[22] study and different races.

Empty follicular openings sign was reported by Waśkiel-Burnat *et al*.[22] as the most frequent marker found among children, but this study considered YDs sign the same as empty follicular openings since the pathophysiology of both conditions is the same, except those children had no or low sebum before puberty, although adults may have low sebum accumulation in the follicular openings by habitual bathing and taking drugs that lower sebum production.[15]

The authors found a high frequency of BHs in pediatric patients, BHs represent an insult to the hair bulb by an inflammatory process and indicate an exacerbation of the disease.[14,23,24] BHs sign showed a significant difference between pediatric and adult groups in the current study and this result may indicate a more progressive disease among children.

EHs and THs markers for active disease by Waśkiel-Burnat *et al*.[15] were higher in adults and correlate with disease severity according to SALT scoring system in the current study.

More than 50% of pediatric and adult patients presented with multiple patches of AA which represent the most common clinical patterns in this study. These results are consistent with other studies.[12,13] The workers found that SVHs correlate negatively with the severe variants of AA in pediatric patients which indicates a marker for hair growth according to Lencastre *et al*.[25] and Bain *et al*. studies.[12]

In the current study, the authors found that URHs had a negative correlation with severe variants in both adult and pediatric cases. They reflect the nondestructive nature of the disease and hair regrowth; therefore, it is considered a marker of healthy, new, hair regrowth according to Waśkiel *et al*. study,[15] however, this result was statistically not significant.

YDs were correlated with the severe clinical subtypes of the disease in both adult and children patients and indicate a poor prognostic sign according to Inui *et al*. study.[23]

THs are considered a marker of progressive disease,[15] since, triangular hairs represent a distal pointed head hair and proximal end embedded under the skin, and this study detects an association between THs and severe clinical patterns of AA in adult patients.

EHs associated statistically with severe clinical forms of AA in adults only, this sign was an indicator of severe and active disease according to Bain *et al*. study,[12] while in children BHs were correlated with severe clinical patterns of AA.

In conclusion, AA affects females child more than males child. YDs and BHs were the most common dermatoscopic finding in children and related to disease activity and severity. In adult patients, SVHs were the most frequent sign followed by YDs. Nail changes were correlated with disease severity in both adults and children.

References

1. Pratt CH, King LE Jr, Messenger AG, Christiano AM, Sundberg JP. Alopecia areata. Nat Rev Dis Primers. 2017;3:17011. Published 2017 Mar 16. doi:10.1038/nrdp.2017.11
2. Xiao FL, Yang S, Liu JB, *et al*. The epidemiology of childhood alopecia areata in China: a study of 226 patients. Pediatr Dermatol. 2006;23(1):13-18. doi:10.1111/j.1525-1470.2006.00161.x
3. Wohlmuth-Wieser I, Osei JS, Norris D, *et al*. Childhood alopecia areata-Data from the National Alopecia Areata Registry. Pediatr Dermatol. 2018;35(2):164-169. doi:10.1111/pde.13387.
4. Nanda A, Al Fouzan AS, Al Hasawi F. Alopecia areata in children: A clinical profile. Pediatr Dermatol 2002;19:482 5.
5. Bhardwaj, Pallawi; Basu, Dibyendu1; Podder, Indrashis2,; *et al*. Clinico-Epidemiological Profile of Childhood Alopecia Areata Along with Dermoscopic Correlation: A Cross-Section, Observational Study. Indian Dermatology Online Journal: Mar–Apr 2021 - Volume 12 - Issue 2 - p 250-257 doi: 10.4103/idoj.IDOJ_451_20
6. Alshahrani AA, Al Tuwaijri R, Abuoliat ZA, Alyabsi M, AlJasser MI, Alkhodair R. Prevalence and clinical characteristics of alopecia areata at a tertiary care center in Saudi Arabia. Dermatol Res Pract 2020;2020:1 4. doi: 10.1155/2020/7194270.
7. Kasumagic-Halilovic E, Prohic A. Nail changes in alopecia areata: frequency and clinical presentation. J Eur Acad Dermatol Venereol. 2009;23:240–241. doi: 10.1111/j.1468-3083.2008.02830.x.
8. Blum, A; Kreusch, J; Stolz, W; Haenssle, H., Braun, R., Hofmann-Wellenhof, R., Tschandl, P., *et al*. (2017). Dermatoskopie bei malignen und benignen Hauttumoren : Indikation und standardisierte Terminologie [Dermoscopy for malignant and benign skin tumors : Indication and standardized terminology]. Der Hautarzt; Zeitschrift fur Dermatologie, Venerologie, und verwandte Gebiete, 68(8), 653–673. https://doi.org/10.1007/s00105-017-4013-5
9. Lallas A, Kyrgidis A, Tzellos TG, *et al*. Accuracy of dermoscopic criteria for the diagnosis of psoriasis, dermatitis, lichen planus and pityriasis rosea. Br J Dermatol. 2012;166(6):1198-1205
10. Al-Refu K. Clinical Significance of Trichoscopy in Common Causes of Hair Loss in Children: Analysis of 134 Cases. Int J Trichology. 2018;10(4):154-161. doi:10.4103/ijt.ijt_101_17
11. Qasim S. Al Chalabi; Anfal Al harbawi; Hala N. Al Salman. "Dermatoscopic evaluation of alopecia areata". Annals of the College of Medicine, Mosul, 43, 2, 2021, 144-151. doi: 10.33899/mmed.2021.131614.1116
12. Bains P, Kaur S. The Role of Dermoscopy in Severity Assessment of Alopecia Areata: A Tertiary Care Center Study. J Clin Aesthet Dermatol. 2020;13(4):45-50.
13. Mane M, Nath AK, Thappa DM. Utility of dermoscopy in alopecia areata. Indian J Dermatol. 2011;56(4):407-411. doi:10.4103/0019-5154.84768
14. Mahmoudi H, Salehi M, Moghadas S, Ghandi N, Teimourpour A, Daneshpazhooh M. Dermoscopic Findings in 126 Patients with Alopecia Areata: A Cross-Sectional Study. Int J Trichology. 2018;10(3):118-123. doi:10.4103/ijt.ijt_102_17
15. Waśkiel A., Rakowska, A., Sikora, M., Olszewska, M., & Rudnicka, L. (2018). Trichoscopy of alopecia areata: An update. The Journal of dermatology, 45(6), 692–700. https://doi.org/10.1111/1346-8138.14283.
16. Olsen EA, Hordinsky MK, Price VH, *et al*. Alopecia areata investigational assessment guidelines--Part II. National Alopecia Areata Foundation. J Am Acad Dermatol. 2004;51(3):440-447. doi:10.1016/j.jaad.2003.09.032.
17. Tan, E., Tay, Y. K., & Giam, Y. C. (2002). A clinical study of childhood alopecia areata in Singapore. Pediatric dermatology, 19(4), 298–301. https://doi.org/10.1046/j.1525-1470.2002.00088.x.
18. Farajzadeh, S., Rahnama, Z., Esfandiarpour, I., Tardast, A., Hasheminasab, S., Damavandi, F. D., . & Fathi, O. (2013). Clinical and demographic profile of childhood alopecia areata in Iran. Journal of pakistan association of dermatologists, 23(1), 20-27.
19. Nikhil N., Mamatha P., Hanumanthayya K. A study of clinical and dermoscopic features in alopecia areata at a tertiary referral center. Int J Res Dermatol. 2020 Nov;6(6):744-749. DOI: https://dx.doi.org/10.18203/issn.2455-4529.IntJResDermatol20204457.

20. Lima CS, Lemes LR, Melo DF. Yellow dots in trichoscopy: relevance, clinical significance and peculiarities. An Bras Dermatol. 2017; 92(5): 724–726.
21. Bapu, N. G., Chandrashekar, L., Munisamy, M., Thappa, D. M., & Mohanan, S. (2014). Dermoscopic findings of alopecia areata in dark skinned individuals: an analysis of 116 cases. International journal of trichology, 6(4), 156–159. https://doi.org/10.4103/0974-7753.142853
22. Waśkiel-Burnat, Anna *et al*. "Trichoscopy of alopecia areata in children. A retrospective comparative analysis of 50 children and 50 adults." Pediatric dermatology vol. 36,5 (2019): 640-645. doi:10.1111/pde.13912.
23. Inui S, Nakajima T, Nakagawa K, Itami S. Clinical significance of dermoscopy in alopecia areata: Analysis of 300 cases. Int J Dermatol. 2008;47: 688–693.
24. Waśkiel-Burnat, Anna *et al*. "Alopecia areata predictive score: A new trichoscopy-based tool to predict treatment outcome in patients with patchy alopecia areata." Journal of cosmetic dermatology vol. 19,3 (2020): 746-751. doi:10.1111/jocd.13064.
25. Lencastre, André, and Antonella Tosti. "Role of trichoscopy in children's scalp and hair disorders." Pediatric dermatology vol. 30,6 (2013): 674-82. doi:10.1111/pde.12173.
26. Waśkiel, A., Rakowska, A., Sikora, M., Olszewska, M., & Rudnicka, L. (2018). Trichoscopy of alopecia areata: An update. The Journal of dermatology, 45(6), 692–700. https://doi.org/10.1111/1346-8138.14283.