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A study on epidemiological features of alopecia areata in children: At tertiary care center, Telangana

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Abstract
Aim & Objective: The objective of this study to assess the epidemiology of alopecia areata, including its incidence, prevalence, and distribution by sex and age.
Methodology: A cross sectional study was carried out at the Department of Dermatology 2017 January-2019 December. During the study period all patients presenting to the dermatology outpatient with a possible diagnosis of alopecia areata were evaluated.
Results: Out of 50 children, 33 (66%) were males, 17 (34%) were females. five (10%) were in 0-5years age group, 31 (62%) were in 6-10 years age group, 14 (28 %) were in 11-15 years age group. Mean age of onset was 8.63 years. In present analysis duration of the illness, out of 50 patients, 24 (48%) had duration less than 3 months, 17 (35%) had duration 4-6 months, five (10%) patients had duration 7 months - 1 year and four (8%) patients had AA of more than one year duration. In the present investigation, out of 50 children, 15(30%) had a positive family history of alopecia areata. Out of 15 patients with family history of AA, twelve were males (24%) and three (6%) were females. Out of 33 males with AA, 15 (45.45%) had a family history of AA. Out of 17 females with AA, only three (17.64%) had a positive family history of AA. scalp was the initial site of involvement in 48 (96%) children whereas the face was the initial site involved in two (4%) child. Out of 48 patients with scalp as initial site of onset, Occipital region was the most common presenting initial site for 22 (45.83%) cases followed by vertex in 13 (27.08%) cases, temporal and parietal in five (10.41%) cases each. In the present study, out of 50 children, 23 (46%) had only single lesion, while 27 (54 %) had multiple lesions. Out of 50 children, patchy AA was found in 28(58 %) children, combined patchy and ophiasis was found in 9 (17 %), ophiasis was found in 7 (16%), combined patchy and diffuse AA was found in 1(2.08%) child, and alopecia universalis, subtotal AA, reticular AA were found in 1(2.08%) child each. Severity of AA in 48 patients with scalp involvement was assessed using the SALT (SEVERITY OF ALOPECIA TOOL) scoring system. 72.91% (35) of the children were having mild AA, 22.91% (11) were having moderate AA and only 4.16% (2) had severe AA. Out of 35 children with mild AA, 20 (57.14%) were males and 15 (42.86%) were females. Out of 11 children with moderate AA, 8 (72.72%) were males and 3 (27.27%) were females. two children with severe alopecia was male.
Conclusion: AA is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgeneticalopecia, and the lifetime risk in the global population is approximately 2%. AA is associated with psychiatric and medical co-morbidities including depression, anxiety, and several autoimmune disorders, and an increased global burden of disease.

Keywords: Autoimmunity, epidemiology, clinical features

Introduction

Alopecia areata (AA) is a common, clinically heterogenous, immune-mediated, non-scarring hair loss disorder [1-3]. The disease may be limited to one or more discrete, well-circumscribed round or oval patches of hair loss on the scalp or body, or it may affect the entire scalp (alopecia totalis) or the entire body (alopecia universalis) [1, 2].

In AA, CD4+ and CD8+ T-cells violate the immune privilege of the anagen hair follicle, leading to loss of the growing hair shaft [4]. CD8+ T-cells are present in significantly greater quantities than CD4+ cells, and a subset of them known as CD8+ NKG2D+ T-cells has been found both necessary and sufficient to induce AA in C3H/HeJ mice [5, 6]. A predominant Th1 cytokine profile has been discovered at the site of AA lesions. Recently, a genome-wide association study demonstrated a genetic predisposition to AA.[7] Environmental insults, such as viral infections, trauma, or psychosocial stress, have also been suspected to possibly contribute to the development of the disease.

It accounts for 2-3% of the new dermatology cases in UK and USA, 3.8% in China, and 0.7% in India [4]. In general population, the prevalence was estimated at 0.1-0.2% with a lifetime risk of 1.7% [4]. Both males and females are equally affected [5], but some studies reported male preponderance [7]. It can occur at any age. The youngest was 4-months-old, and the oldest was in late seventies [8]. Twenty percent of cases were children, and 60% of AA patients had their first patch before 20 years of age [5]. Highest prevalence was between 30-59 yrs of age. Family members are affected in 8.7-20% of cases [2, 8].

Hypotheses regarding the pathogenesis of AA include a lymphocyte-mediated inflammation that suggests an underlying autoimmune etiology, an association with HLA class II antigen alleles, and contribution from environmental factors such as hormonal fluctuation, infectious agents, vaccinations, and stress. Common treatment modalities includeintralesional steroids and topical immunosuppresants.

The objective of this study to assess the epidemiology of alopecia areata, including its incidence, prevalence, and distribution by sex and age.

Materials and methods

Patients & methods

This is an observational study conducted over a period of 24 months, from January 2017 to December 2019 among the children attending DVL OPD at Dr VRK Women's Medical College & Teaching Hospital and Research Centre, Hyderabad.

Inclusion criteria

Patients with alopecia areata who were less than 18 years age, presenting to dermatology OPD, were included in the study.

Exclusion criteria

All patients more than18 years of age were excluded. Non scarring alopecias of other etiologies were excluded. All scarring alopecias were excluded. Patients unwilling to participate in the study were excluded.

All the patients with alopecia areata presenting to DVL OPD were included in the study with prior informed parental consent.

Name, age, sex and detailed demographic data of the patient were recorded. A detailed history on duration of AA, chief complaints, skin lesions, onset and progression of lesions was elicited and recorded. Dietary history and family history were noted. History of atopy, thyroid disorders, diabetes, connective tissue disorders and any history suggestive of other autoimmune disorders and HTN in patients or other family members was taken.

A detailed general and systemic examination was carried out and findings were noted. In Dermatological examination, size, surface, number, site of patch/patches, nail changes, pattern of hair loss and hair changes like exclamatory mark hair were noted. SALT scoring was done in all cases. Severity of AA was graded as mild (SALT Score less than 25), moderate (SALT Score 25-75) and severe (SALT Score more than 75). Examination for other dermatological disorders was done. Patients were also examined for caries tooth.

Routine investigations like, complete blood picture, absolute eosinophil count, blood sugar, blood urea, serum creatinine, liver function tests and thyroid profile were carried out in all patients. Data was tabulated and analysed using ratios and percentages.

Results and Discussion

The present study comprised of 50 children with alopecia areata (AA). The present investigation showed that variation in different epidemiological factors. The variation occurring, sex, age, duration of illness, family history, site of onset, site of involvement, number of lesions, site of scalp and site of scalp lesions in various age groups and patterns of alopecia areata and involvement of different parts of the body out of 50 children, 33 (66%) were males, 17 (34%) were females. These studies were similar or close related with some other previous studies. This variation may be influenced by the various genetic and environmental factors. No significant difference in the incidence of AA was found between males and females in either of the two population studies.

Table 1: Sex distribution

Males	Females	Total
33 (66%)	17 (34%)	50

In the present study, the age of the children in the study group ranged from 3 months – 15 years. Out of 50 children, five (10%) were in 0-5years age group, 31 (62%) were in 6-10 years age group, 14 (28 %) were in 11-15 years age group. Mean age of onset was 8.63 years. Previous studies done by other studies done by Viswanath and Guruprasad [9, 10]. (7-10 Years, 44%, 7-10 Years, 47%), In children, the mean age of onset has been reported as between ages 5 and 10 years. Mean age of onset in our study was 8.73 years compared to the studies done by Ahmed [11] and Viswanath [9]. In our study, 85% presented within 6 months of onset of AA. These studies were similar or closely related with other previous findings.

Table 2: Age distribution

Age group	Male	Female	Total	Percentage
0-5 years	3	2	5	10%
6-10 years	22	9	31	62%
11-15 years	12	2	14	28%
Total	37	13	50	

In present analysis duration of the illness, out of 50 patients, 24 (48%) had duration less than 3 months, 17 (35%) had duration 4-6 months, five (10%) patients had duration 7 months - 1 year and four (8%) patients had AA of more than one year duration. These studies revealed that the duration of the illness seen more in less than 3 months and moderately have observed in other age groups (above 6 months age).

Table 3: Duration of illness

Duration	No. of Patients	Percentage
0-3 months	24	48%
4-6 months	17	34%
7months -1 year	5	10%
>1 year	4	8%

In the present investigation, out of 50 children, 15(30%) had a positive family history of alopecia areata. Out of 15 patients with family history of AA, twelve were males (24%) and three (6%) were females. Out of 33 males with AA, 15 (45.45%) had a family history of AA. Out of 17

females with AA, only three (17.64%) had a positive family history of AA. From this study we acknowledged that 15-20% patients had family history of alopecia areata. These findings more or similar with other studies made by Guru Prasad. [10] From the above observations, it can be stated that various immunological and genetic factors is important in the occurrence of this disease. The differences may be attributed to various environmental and psychological factors which may play an important role for its manifestation.

Table 4: Family history of alopecia areata

	Family history present	Family history absent
Males	15 (45.45%)	18 (54.54%)
Females	3 (17.64%)	14 (82.35%)

Out of 50 children, scalp was the initial site of involvement in 48 (96%) children whereas the face was the initial site involved in two (4%) child.

Table 5: Site of onset

Site of onset	No. of patients	Percentage
Scalp	48	96%
Face	2	4%

Out of 48 patients with scalp as initial site of onset, Occipital region was the most common presenting initial site for 22 (45.83%) cases followed by vertex in 13 (27.08%) cases, temporal and parietal in five (10.41%) cases each. Frontal region was least common presenting initial site accounting for only three (6.25%) cases. In a study done by Vishwanath *et al*. [9] occipital region was the site of onset in 52% of the patients.

Table 6: Site of onset on scalp

Initial site of scalp involvement	No. of patients	percentage
Occipital	22	45.83%
Vertex	13	27.08%
Parietal	5	10.41%
Temporal	5	10.41%
Frontal	3	6.25%

Out of 50 children with AA, scalp was the only site involved in 35 (70%) children, face was the only site of involvement in two (4%) child whereas 11 (22%) children had both scalp and face involvement, two (4%) child had scalp, face and truncal lesions and one child had complete body involvement. The other studies reported by Jain scalp involvement in 72.67%, 12.67% had AA without scalp involvement, 14.66% had involvement of both scalp and other areas [12]. The other studies carried out by Saeedeh Farajzad scalp (82%) to be the predominant site of involvement [13].

Table 7: Sites of involvement

Sites involved	No. of children	Percentage
Only scalp	35	70%
Only face	2	2%
Scalp and face	11	22 %
Scalp, face, trunk	1	2%
Whole body	1	2%

In the present study, out of 50 children, 23 (46%) had only single lesion, while 27 (54 %) had multiple lesions. In a study done by Vishwanath, 16% cases had multiple lesions and 84% of cases had single lesion [9]. In a study done by Jain S *et al*. 140, 64.66% cases had multiple lesions and 35.34% of cases had single lesion.

Table 8: Number of lesions

No of lesions	Male	Female	Total	Percentage
Single	15	8	23	46%
Multiple	18	9	27	54%
Total	33	17	50	

Site of scalp lesions

Out of 48 patients with scalp involvement, occipital region 15 (31%) was the most common site involved followed by parietal region 11 (22.91%), vertex 10 (20.83%), temporal 8 (16.66%) and frontal region 4 (8.33%).Vishwanath *et al*.[9] reported occipital region (52%) as the commonest site of involvement in his study followed by vertex (32%). In a study by Guruprasad *et al*. [10] occiput (48.7%) was the common site in children followed by vertex (38.4%).

Table 9: Site of scalp lesions

Site if scalp involvement	Total	Percentage
Occipital	15	31%
Vertex	10	20.83%
Parietal	11	22.91%
Temporal	8	16.66%
Frontal	4	8.33%

Analysis of various age groups showed similar trends in affliction of the scalp regions. Occipital region was the most common site of involvement and frontal region was the least common site of involvement in all the age groups of the study population. Vishwanath *et al*. [9] reported occipital area as most common site in less than 6 years old children. In his study, 7-10 years children presented an equal split of 36% each between temporal area and occipital area, while children more than 10 years showed vertex as a primary site (40%).

Table 10: Site Involvement

Site of scalp involvement	0-5 years	6-10 years	11-15 years
Occipital	2 (13.33%)	9 (60%)	4 (26.66%)
Vertex	2 (20%)	6 (60%)	2 (20%)
Parietal	2 (18.18%)	5 (45.45%)	4 (36.36%)
Temporal	2 (25%)	4 (50%)	2 (25%)
Frontal	0	2 (50%)	2 (50%)

Patterns of alopecia areata

Out of 50 children, patchy AA was found in 28(58 %) children, combined patchy and ophiasis was found in 9 (17 %), ophiasis was found in 7 (16%), combinedpatchy and diffuse AA was found in 1(2.08%) child, and alopecia universalis, subtotal AA, reticular AA were found in 1(2.08%) child each. Patchy alopecia areata was the most common pattern observed in both males and females, followed by ophiasis, diffuse AA, alopecia universalis, subtotal AA and reticular AA. Alopecia universalis was 2% and Alopecia subtotalis was 2% had been observed in our study. Maitreyee Panda *et al*. [14] reported patchy alopecia

areata was the commonest (88%) variant noted, while alopecia totalis (1%), alopecia universalis (6%) and ophiasis pattern (5%) were other patterns noted.

Table 11: Patterns of alopecia areata

Patterns of AA	Males	Females	Total	Percentage
Patchy AA	18	10	28	58%
Ophiasis	7	1	8	18%
Patchy and ophiasis	4	3	7	6%
Patchy and diffuse	0	1	1	2.08%
Reticulate	1	0	1	2.08%
Subtotalis	1	0	1	2.08%
Universalis	1	0	1	2.08%

Involvement of face

Out of 15 children with face involvement, both eyebrow and eyelashes were involved in 8 (53.33%) Only eyelashes were involved in 4 (26.66%) children. Only eyebrows were involved in 3 (20 %) children.

Table 12: Involvement of face

	Males	Females	Total
Eyebrows &eyelashes	8	0	8 (53.33%)
Eyelashes only	3	1	4 (26.66%)
Eyebrows only	3	0	3(20%)
Total	14	1	15

14 (93.33%) out of 15 children with facial involvement were found to be males. In a study done by Gopal *et al*. [15] eyebrows were involved in 7.5% of cases, eyelashes in 0.83%. Out of 50 children with AA, 13(26%) had nail changes. Out of 13 children with nail changes, Nail pitting was observed in eight (61.53%) children, ridging was observed in two (15.38%) children, nail thinning was observed in two (15.38%) children and leukonychia was seen in one (7.69%) child. Out of 33 males with AA, 9 (27.27) had nail changes. Out of 17 females with AA, 6 (35.29%) had nail changes.

Table 13: Involvement of nail

Nail changes	Males	Females	Total
Pitting	2	6	8 (61.53%)
Ridging	2	0	2(15.38%)
Thinning	1	1	2(15.38%)
Leukonychia	1	0	1(7.69%)
Total	6	7	13

Exclamatory mark hair

Out of 50 children, 35 (70%) children with AA showed exclamatory mark hair at the periphery of the lesions. Suma Patil *et al*. 159 observed 12% of patients with exclamatory mark hair with equal sex incidence in her study. Guruprasad *et al*. [10] and Gopal *et al*. [15] found exclamatory mark hair in all patients of their study.

Table 14: Exclamatory mark hair

Males	23
Females	12
Total	35 (70%)

Severity of alopecia areata

Severity of AA in 48 patients with scalp involvement was assessed using the Salt (Severity of Alopecia Tool) scoring system. 72.91% (35) of the children were having mild AA, 22.91% (11) were having moderate AA and only 4.16%(2) had severe AA. Out of 35children with mild AA, 20 (57.14%) were males and 15(42.86%) were females. Out of 11 children with moderate AA, 8 (72.72%) were males and 3 (27.27%) were females. two children with severe alopecia was male. More number of males had moderate and severe forms of alopecia areata. In a study done by Ahmed *et al*. [11], Mild alopecia areata (41%) was the most common presentation followed by moderate disease (31%), severe alopecia (17%). Nasreen *et al*. [11] also reported mild (40.2%) form of the disease to be the most common presentation followed by moderate (32%) and severe (17%) forms of alopecia areata.

Table 15: Severity of alopecia areata

Severity of Salt score	Males	Female	Total	Percentage
<25 (Mild)	20	15	35	72.9%
26-75 (Moderate)	8	3	11	22.91%
>75 (Severe)	2	0	2	4.16%
	30	18	48	

Severity of alopecia areata and face involvement

Out of 35 children with mild AA, 8 (17.14%) had eyebrow (EB) / eyelash (EL) involvement. Out of 19 children with moderate AA, four (40%) had eyebrow/eyelash involvement. One child with severe AA had eyebrow/eyelash involvement.

Table 16: Severity of alopecia areata and face involvement

Severity (SALT score)	EB/EL+	EB/EL -
<25	7	26
26-75	4	9
>75	2	0

Conclusion

Alopecia areata is a psychologically debilitating disease for which no cause has yet been found. Disease pathogenesis has been partially unraveled in the last few decades and polygenic inheritance potential has been suggested. An association with thyroid disorders supports an autoimmune aetiology. Nail changes were more frequent in atopics and in severe alopecia. Thyroid disorders were more frequent in moderate and severe form of alopecia areata. Ophiasis, a bad prognostic factor, was more frequent in atopics but the severity assessment using the SALT scoring did not show a direct correlation with atopy. Further multi-centric long term follow-up studies are needed to better understand the disease process.

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Conflict of Interest: Nil

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