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Original Research Article

Clinico-Epidemiological Profile and Association of Autoimmune Disorders among Alopecia Areata Patients: A Hospital Based Study

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Abstract:

Background: Alopecia areata is an autoimmune disease associated with other autoimmune diseases such as atopic dermatitis, thyroid diseases including Hashimoto's thyroiditis, vitiligo, psoriasis, lichen planus, addison's disease, pernicious anemia, lupus erythematosus, diabetes mellitus etc.

Aims: To describe the clinic-demographic profile of alopecia areata; to find out the incidence of different clinical patterns and search for prevalence of other autoimmune disorders in association with alopecia areata.

Materials and Methods: This study was conducted on 120 patients with alopecia areata of any age and both sexes attending dermatology OPD. Same number of age and sex matched patients with cutaneous disorders other than alopecia areata were included in the control group. All the patients were interviewed regarding detail demographic data, clinical pattern of alopecia areata, thoroughly examined to search for other cutaneous as well as systemic autoimmune diseases. All the patients were screened with thyroxin, triiodothyronine, thyroid-stimulating hormone, and microsomal antibody (Anti-TPO Ab) levels and few baseline investigations. Other laboratory investigations were done to diagnose other autoimmune diseases.

Results: In this study, mean age of 26.21 years with 87.5% of patients under 40 years of age. 87 (72.5%) patients were of patchy alopecia areata where most of the cases were of mild (S1) variety (84, 70%). 7 (5.83%) patients had vitiligo, which was the most frequently occurring associated cutaneous autoimmune disorder. Out of 120 alopecia areata patients, 11 (9.16%) patients had thyroid disorders, which was the most frequently occurring associated systemic autoimmune disorder where 14 (11.66%) were found to have elevated Anti-TPO Antibody level compared to only 3 (2.65%) patients of control group.

Conclusion: In our study patchy alopecia areata was most frequent, majority were of mild variety; and vitiligo was the most frequently associated cutaneous autoimmune disorder. This study also indicated about the high incidence of elevated thyroid autoantibody (Anti-TPO) level and thyroid functional disorders associated with alopecia areata prompting us to perform thyroid function tests and thyroid autoantibody tests routinely for all patients with alopecia areata.

Introduction

Alopecia areata (AA) is a non-scarring type of autoimmune alopecia that can affect any hair-bearing area. It is an organ-specific immunologically mediated disorder, which can clinically present with many different patterns. There have only been few large population-based study, the prevalence of alopecia areata in the Olmsted country, USA, has been estimated to be approximately 0.1% to 0.2% of the population [1] with an average lifetime risk of developing alopecia areata estimated to be 1.7% [2]. Most patients develop AA before 40 years of age [3], with 11% to 20% of all cases occurring in children [4]. Clin-

ical presentation of AA is subcategorized according to the pattern or extent of hair loss. According to the pattern the following patterns are seen: patchy AA (round or oval patches of hair loss-most common); reticular AA (reticulated pattern of hair loss); ophiasis pattern (band like pattern of hair loss along the periphery of the temporal and occipital scalp); sisaphio or ophiasis inversus (a rare band like pattern of hair loss in front-parietal-temporal scalp); and diffuse alopecia areata (a diffuse decrease in hair density). If categorized according to the extent of involvement following forms may be seen: alopecia areata (AA), partial loss of scalp hair; alopecia totalis (AT), 100% loss of scalp hair; and alopecia universalis (AU), total loss of all body hair [5]. In the earliest classification of AA, Ikeda (1965) divided AA into [4] categories: the "common" type with generally a good prognosis, the "atopic" type often an onset in the childhood, the "prehypertensive" type showing a high rate of progression to alopecia total is and the "endocrine-autonomic" type or the "autoimmune" type [6, 7]. AA is hypothesized to be an organ specific autoimmune disease mediated by T lymphocytes directed to the hair follicles [8, 9]. AA may be associated with other autoimmune diseases such as atopy, thyroid diseases including Hashimoto's thyroiditis, vitiligo, psoriasis, lichen planus, morphea, lichen sclerosus et atrophicus, pemphigus foliaceus, Addison's disease, pernicious anaemia, lupus erythematosus, diabetes mellitus [10,11]. The relationship may be correlation and not causal. Histopathologic changes with a peribulbar and at the lower one third of the follicle, a lymphocytic infiltrate ('swarm of bees') with no scarring is characteristic in all stages of AA [12].

There is a scarcity of reports of alopecia areata and associated autoimmune disorders from eastern part of India, having only few reports from northern India. The present study was conducted in view of very limited number of studies from eastern India on association of autoimmune disorders among patients with alopecia areata.

Materials and Methods

This study included 120 patients with alopecia areata of any age and both sexes attending dermatology OPD after taking valid written consent to participate in this study. They were put into case group. Same number of age and sex matched patients with cutaneous disorders other than alopecia areata were included in the control group. Patients with immunosuppressive diseases like malignancy, HIV and physiological conditions like pregnancy and lactation were excluded from this study. All the patients were interviewed regarding detail demographic data, complete clinical pattern of alopecia areata, thoroughly examined to search for other cutaneous as well as systemic autoimmune diseases. Patients with alopecia areata were interviewed with special emphasis on the age at onset, duration of illness, h/o recurrence, personal and/or family history of atopy, alopecia areata and autoimmune disorders. Careful physical examination were done including pattern of hair loss (patchy, diffuse, reticulate, ophiasis, sisaphio, alopecia totalis, alopecia universalis), area of involvement, evaluation of disease extent and systemic examination for associated autoimmune diseases. All the patients were screened with thyroxin, triiodothyronine, thyroid-stimulating hormone, and microsomal antibody (Anti-TPO Ab) levels and few baseline investigations. Other laboratory investigations (diabetes mellitus-FBS, PPBS; lupus erythematosus-ANA, Anti dsDNA; pernicious anaemia-Anti parietal cell Antibody, endoscopy and gastric parietal wall biopsy; Addison's disease-plasma ACTH, ACTH stimulation test: cortisol and aldosterone level) were done and recorded in the light of specific complaints and physical examination findings. Data was processed and analyzed using the SPSS. Categorical variables were expressed as number and their percentage (%) of the total. Numerical variables were expressed using Mean ± SD. p-Values were extracted from Fisher's Exact Probability Test for all variables except age distribution, for which Levene's Test for Quality of Variance were applied. The statistical analysis plan for the study considered p values of < 0.05 as significant and the 95% confidence interval for the difference in means.

Results

In this study, male (60) and female (60) patients were equal in number in both the alopecia areata group and control group. In the analysis of age distribution, age at onset ranged from 1 year to 62 years with a mean age was 26.21 years and standard deviation of 12.46 years & the mean age in control group was 24.35 years with S.D 15.45. 21 (17.5%) patients in the case group had a history of atopy compared to 6 (5%) patients in the control group which was statistically significant ($p<0.0001$).

In this study, largest number of patients belonged to 3rd decade (29, 24.16%) followed by 1st decade (31, 25.83%) with 87.5% of patients under 40 years of age. The lowest incidence was in the 7th decade (2, 1.7%). In this study, 87 (72.5%) patients were of patchy alopecia areata. 8 (6.7%) of them were of reticular type, 5(4.2%) ophiasis type, 7(5.8%) diffuse alopecia areata, where 5(4.2%) and 7(5.8%) patients were of alopecia totalis and alopecia universalis type respectively [Fig 1].

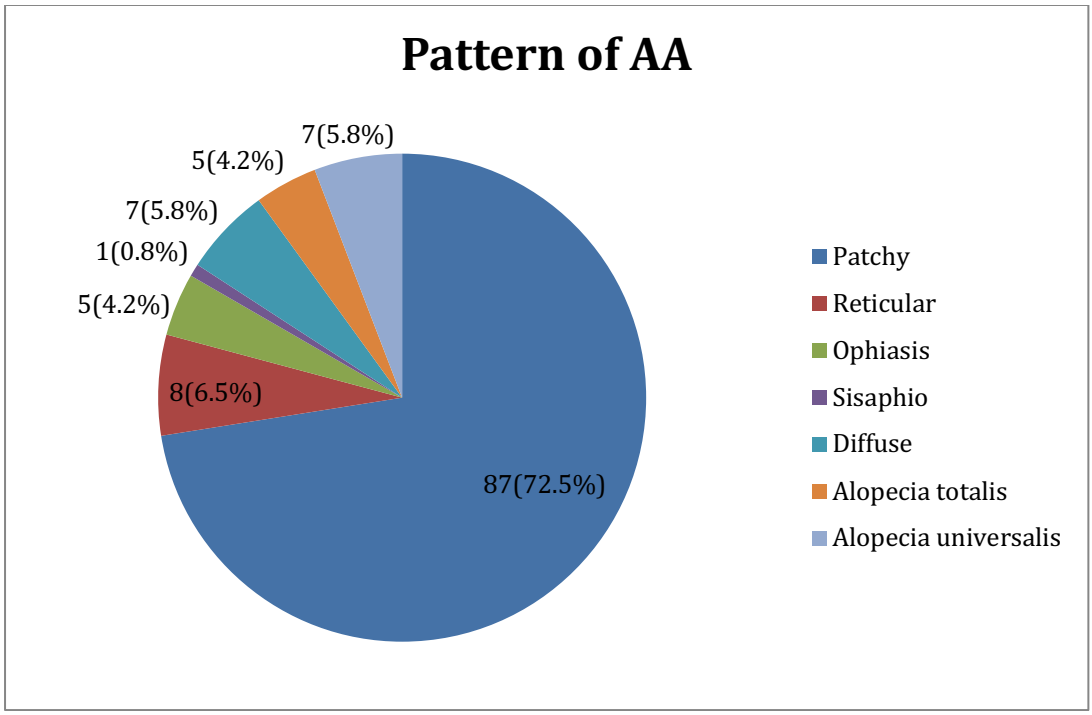

Figure 1: Various pattern of involvement in AA (n=120)

It is clear from the above figure 1 that patchy AA was the dominant pattern (87, 72.5%) and sisaphio was the least frequent type (1, 0.8%).

In this study 40 (33.83%) patients presented with single patch where most 52 patients (43.4%) presented with 2-5 patches with mean number of patches was 3.66 with standard deviation 3.49. [Fig 2]

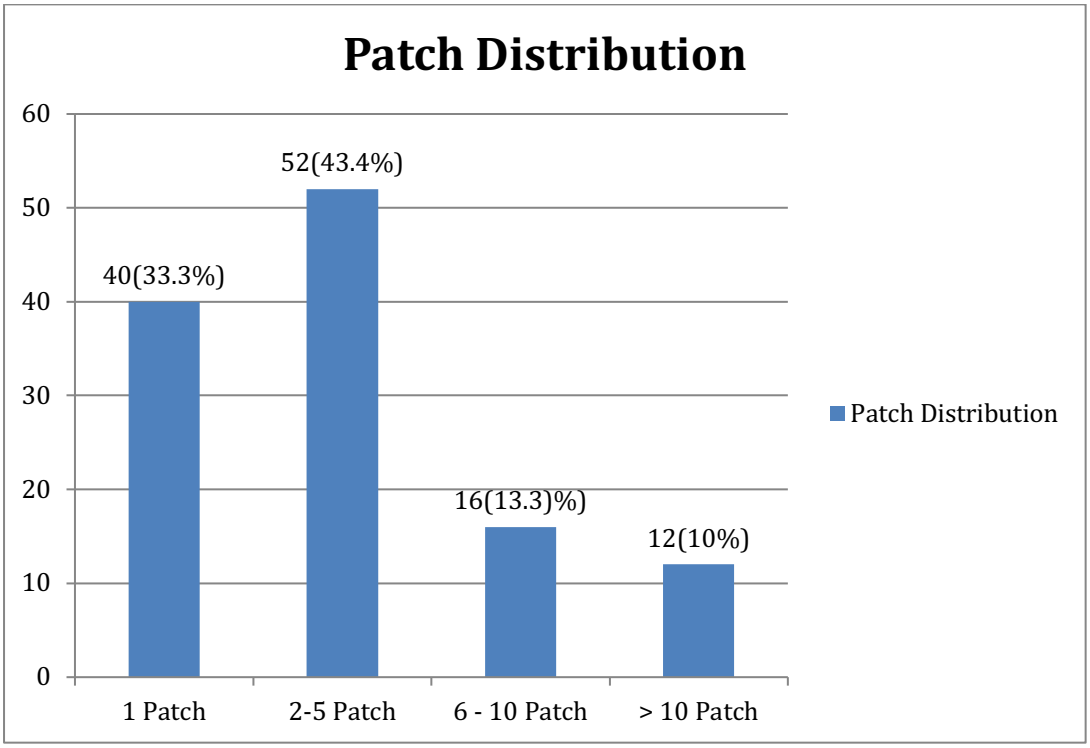

Figure 2: Number of alopecia patch at presentation (n=120)

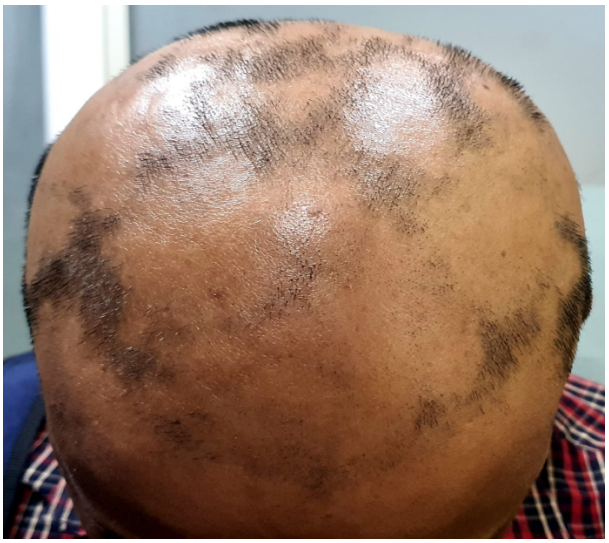

Figure 3: Patchy alopecia areata

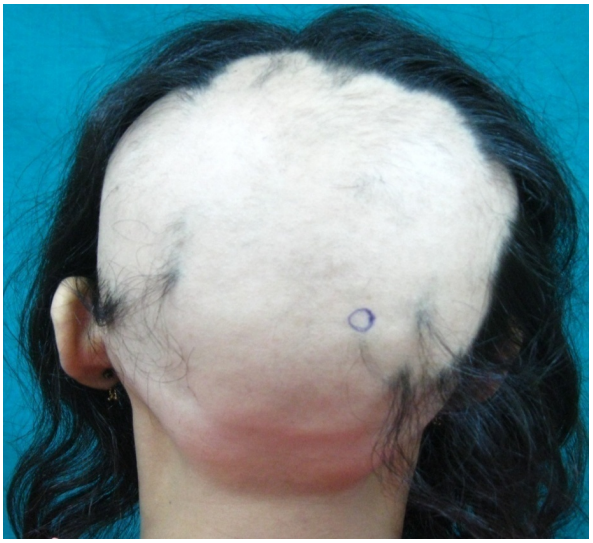

Figure 4: Ophiasis pattern of Alopecia areata

In this study, most of the cases were of mild (S1) variety (84, 70%) and alopecia totalis and alopecia universalis were rarely found [Table 1].

Table 1: Severity of involvement in alopecia areata (n=120)

Severity of involvement	Number of patients	Percentage (%)
Mild (S1)	84	70.0
Moderate (S2)	18	15.0
Severe (S3+S4)	6	5.0
Alopecia totalis (S5)	5	4.2
Alopecia universalis (S5+B2)	7	5.8

Out of 120 patients with alopecia areata 11 (9.16%) patients had thyroid disorders, which was the most frequently occurring associated autoimmune disorder among the systemic disorders. 3 (2.5%) patients had diabetes mellitus, 2 (1.67%) of SLE. Same number (1, 0.83%) of patients with alopecia areata was found to have pernicious anemia, Addison's disease and myasthenia gravis in each. 7 patients had vitiligo (5.83%), which was the most frequently occurring associated cutaneous autoimmune disorder. 4 (3.33%) patients with alopecia areata had psoriasis;

2(1.67%) patients had lichen planus and 1 patient had morphea [Table 2].

Table 2: Autoimmune disorders associated with AA (n=120)

Autoimmune disorders	Number of patients	Percentage (%)
Thyroid disorder	11	9.16
Vitiligo	7	5.83
Psoriasis	4	3.33
Diabetes mellitus	3	2.5
Lichen planus	2	1.67
SLE	2	1.67
Others(Pernicious anemia, Addisons disease, MG, Morphea 1 each)	4	3.0

Among alopecia areata patients 14 (11.66%) patients were found to have elevated Anti-TPO Antibody level whereas only 3 (2.65%) patients of the control group which was statistically significant (p value was 0.002). For thyroid disorders it was 11(9.16%) compared to control which was also found to be statistically significant (p value was 0.0001).

Discussion

Alopecia Areata (AA) is one of the common causes of non-cicatricial alopecia having multi factorial etiology and associations. Early diagnosis of the disease at the earliest and identification of associated conditions are important in the management, prognosis and counseling of the patients.

In our study patchy alopecia areata was most frequent, majority were of mild variety which is also supported by majority of previous studies. In our study, vitiligo was the most frequently associated cutaneous autoimmune disorder. The prevalence of thyroid diseases determined on clinical, or laboratory basis varies among studies from 0.85-14.7%. The incidence of thyroid disease in control subjects is estimated to be 0.17-2% in various studies. The presence of microsomal antibodies is found in 3.3-16% of patients in earlier studies [12, 13].

Antibodies can be found with or without signs or symptoms of thyroid disease, but patients with positive autoantibodies have a higher incidence of functional abnormalities found on thyroid function tests (26% vs 2.8%). In Muller and Winkelman's study (1963) [11], among 736 cases 8% of the patients reported to have thyroid diseases compared to 2% among controls. Among various diseases reported were Simple goiter (3.6%), Myxedema (0.95%), Exophthalmic goiter (1.9%) and Hashimoto's thyroiditis (0.81%). Puavilai et al (1994) [15], in their study in Bangkok, Thailand, reported that microsomal antibodies were detected in seven patients (4.6%) with titres ranging from 1:100 to 1:1600. Five cases (3.3%) of the control group had positive microsomal antibody tests with titres ranging from 1:100 to 1:400. The prevalence of positive microsomal antibodies in the alopecia areata group was not statistically different from the control group (chi 2 = 0.347, DF = 1, P = 0.5558). Thomas and Kadyan (2008) [16], in their study reported that thyroid disorders showed the highest frequency. Among the thyroid disorders, hypothyroidism was the most frequent association (14.1%). In a study of Seyrafi H et. al., thyroid function abnormalities were found in 8.9% of patients. Positive autoimmune antibodies were found to have associated with alopecia areata patients in as high as 51.4 % of patients. In our study there was significantly higher incidence of serum Anti-TPO positivity in alopecia areata patients (14, 11.66% with p-Value=0.002) compared to control subjects (3, 2.65%). Incidence of thyroid diseases was also significantly higher (11, 9.16% with p-Value=0.0001) in alopecia areata patients than control population (0, 0%). So, it is prudent to perform thyroid function test along with thyroid autoantibody tests routinely for all patients with alopecia areata. Vitiligo, psoriasis, morphea, lichen planus, SLE, pernicious anemia, addison's disease and myasthenia gravis were the other associated autoimmune disorders occasionally found which should be searched for with thorough clinical examinations and appropriate laboratory investigations.

Conclusion

In our study patchy alopecia areata was most frequent; majority were of mild variety and vitiligo was the most frequently associated cutaneous autoimmune disorder. Our study provides us the information about the high incidence of elevated autoimmune thyroid antibody (Anti-TPO) level and thyroid functional disorders associated with alopecia areata prompting us to perform thyroid function tests and thyroid autoantibody tests routinely for all patients with alopecia areata. Thorough search for identification of associated autoimmune disorders are important in assessing the prognosis and subsequent management of the patients.

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