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Original Article

Prevalence of thyroid disorders in patients with alopecia areata

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Abstract

Objective To study the prevalence of autoimmune thyroid disorders – thyroid auto-antibodies in patients with alopecia areata (AA) in Kerman, a city in South-East part of Iran.

Methods 52 patients with AA from those attending the dermatology ward of Afzalipour hospital in Kerman were enrolled. An equal number of age- and sex-matched controls (n=52) was included. Physical examination of thyroid was done for all patients and controls. The rate of positivity of anti-thyroid peroxidase (TPO) antibodies and abnormal thyroid hormone levels in both groups were measured and compared.

Results In both cases and controls, 48.1% and 51.9 % were males and females, respectively. The mean age in group of cases and control groups were 30.55 and 31.80 years, respectively. The number of lesions ranged from 1 to 10, and the duration of disease ranged from 0.6 to 96 months. No meaningful statistical difference was seen between prevalence of thyroid disorders in patients of AA and controls.

Conclusion In this study no correlation between AA and thyroid disorders was noted.

Key words
Alopecia areata, thyroid disorders, autoimmune disorders.

Introduction

Alopecia areata (AA) is a common hair disorder that manifests as sudden appearance of patches of nonscarring alopecia. Around 1-2% of communities are affected and it usually commences in childhood-juvenile period.[1]

Potentially, every hair-bearing area of skin can be involved; however, AA usually affects scalp. The disease may progress to involve the whole scalp (alopecia totalis) or total body (alopecia universalis). AA, may be associated with specific signs in nails, as well.[2] Hair loss affects the quality of life and may lead to social loneliness especially in children and adolescents.[3]

Although many theories have been propounded, its etiology and pathogenesis have not been elucidated yet, but many evidences support the theory that AA is an autoimmune disease affected by genetic, psychological and environmental factors, but relative importance of these factors is not clear yet.[4] Many evidences and data support the role of autoimmune processes in the pathogenesis of AA.[5,6,7] The interaction between T lymphocytes of the immune system and follicular antigens has been

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shown.[5] In histopathology examination of AA a lymphocytic infiltration around follicular root of anagen and early catagen hairs was found.[8]

In many cases AA is associated with other autoimmune diseases such as atopy,[6] Hashimoto's thyroiditis,[9] diabetes mellitus and vitiligo. There are studies regarding increased risk of autoimmune disorders in first degree relatives of children with AA, especially thyroid disorders.[10] A few reports regarding probable association of AA with celiac disease (gluten sensitive enteropathy) exist.[11] There are reports of abnormal thyroid function tests in patients with AA[9,10,12] as 8-10% cases of alopecia totalis and alopecia universalis are reported with increased prevalence of thyroid dysfunction.[13]

Despite many reports regarding association of AA with thyroid disease, no complete consensus exists about prevalence of thyroid disease and thyroid dysfunction in AA.[14] As few studies exist in this field, we decided to study the prevalence of thyroid disease and thyroid autoantibodies in patients with AA in Kerman.

Methods

This was a case-control study comprising of 52 cases of AA who visited dermatology ward in Afzalipour hospital and private clinics in Kerman, a city located in South-East of Iran. These cases were enrolled with simple sampling method. Inclusion criteria for the cases in this study consisted of clinical diagnosis of AA by a dermatologist. Exclusion criteria for the study consisted of history of thyroid disease, pregnancy and other autoimmune diseases.

The second group (control group) had also 52 cases from those who visited in dermatological clinics and had no history of AA and other autoimmune or thyroid diseases. Written consent form was obtained from patients or their parents. Demographic data including age, sex, involved area, number of patches, size of the lesions, duration and severity of disease and type of the lesions were recorded. For all the cases in both groups physical examination for thyroid was undertaken and blood samples for studying of dysfunction and diseases of thyroid were collected. Serum levels of anti-thyroid peroxidase (TPO) antibodies, TSH, free T3 and free T4 with chemiluminescent method were done. All the laboratory tests were carried out in the same conditions.

Finally the rates of positivity of anti-TPO and serum level of thyroid hormones were compared in the 2 groups.

Demographic data were recorded in a predesigned form. The relationship between dysfunction of thyroid gland and AA was assessed by $\chi 2$ (Chi square), and Fischer bicaudal exact test and T test used for analysis of data. P value of less than 0.05 was statistically considered meaningful. Data analysis was done by SPSS software. The process of the study was explained for cases in both groups and consent form was obtained, as well.

Results

In general 48.1% of the cases were male and 51.9% were female and no meaningful difference was seen (**Table 1**). The average age

Table 1 Age and sex distribution in two groups.

	Cases	*Controls*	*Total*	*P value*
Male	29 (55.8)	21 (40.4)	50(48.1)	0.169
Female	23 (44.2)	31 (59.6)	54(51.9)	
Mean age (years)	30.55±10.01	31.80±8.38		0.497

Table 2 Disease characteristic in the study population (n=52).

Feature	
Clinical type	
Limited	47 (90.4%)
Totalis	3 (5.8%)
Ophiasis	2 (3.8%)
Involved sites	
Scalp	50 (96%0
Eyebrows	5 (9.6%)
Beard area	17 (33%)
Eyebrow, beard and eyelashes	22 (42.6%)
Nail changes	
Present	5 (9.5%)
Negative	47 (90.5%)
Family history	
Positive	5 (9.5%)
Negative	47 (90.5%)
Duration of illness (months)	
Range	0.6-96
Mean	9.3±16.13
Number of lesions	
Range	1-10
Mean	3.40±2.52
Scalp hair loss	
No hair loss	3 (6%)
>25% hair loss	44 (84%)
26%-50% hair loss	4 (8%)
100% hair loss	1 (2%)
Body hair loss	
No body hair loss	42 (80)
Body hair loss	10 (19.25%)
No nail changes	45 (86%)
Nail involvement	7 (14%)

of the cases was 30.55 and 31.80 in case and control groups, respectively (p>0.05). The duration of lesions ranged from 0.6 up to 96 months, and the number of lesions ranged from 1 up to 10. Table 4 shows these results.

Table 2 shows the different involved areas by AA. Eighty percent of the cases with AA had no involvement of body hairs, and 86% had no nail involvement.

The seropositivity rate of anti-TPO in case group and control group were 11.5% and 5.8%, respectively (**Table 3**).

Frequency of TSH dysfunction in thyroid gland in case group and control group were 7.7% and 3.8%, respectively (p>0.05), (**Table 4**). T3 dysfunction in case group and control group were 7 and 2 individuals, respectively (p>0.05). Similarly, there was no difference in the rate of dysfunction of T4 in the two groups (p>0.05).

Discussion

In this case-control study, in the case group there were 52 patients with AA, and in control group 52 individuals with other skin diseases were enrolled. We tried to consider all confounder factors. In our study, there was no gender difference. Alopecia in juvenile group has the same prevalence in both sexes.[1-3] The age of onset in our study was in accordance with previous studies[1,2,14] with the onset of first episode in the first 4 decades of life. Based on the previous studies alopecia in juvenile period is the most sever type with the worst probable outcome.[15] The duration of lesions ranged between 0.6 and 96 months and the number of lesions from 1-10. Eighty percent of the cases with AA had no involvement of body hairs, and 86% were free from nail involvement.

The positivity rate of thyroid dysfunction and dysfunction of TSH, T3 and T4 in the case group and control group showed no meaningful statistical difference (p>0.05). Also there was no meaningful statistical difference between thyroid diseases and severity of AA (p>0.05). Our results are in agreement with many studies.[12,13,16]

In a study done by Seyrafi *et al*.[13] the diseases of the thyroid and autoimmune antibodies were seen in 8.9% and 51.4% of individuals and no meaningful statistical difference was observed, and no correlation between these autoantibodies and the severity or duration of AA were seen, as

Table 3 Frequency of anti-TPO between two groups.

	Cases (n=52)	*Controls (n=52)*	*Total*	*P value*
Normal	46 (88.5%)	49 (94.2%)	95 (91.3%)	0.488
Abnormal	6 (11.5%)	3 (5.8%)	9 (8.7%)	

*Based on Chi-square, Data are shown as abundance (%)

Table 4 Abundance rate of dysfunction in thyroid gland in the study.

	Cases	*Controls*	*Total*	*P value*
TSH levels				
Normal	48 (92.3%)	50 (96.2%)	98 (94.2%)	0.678
Abnormal	4 (7.7%)	2 (3.8%)	6 (5.8%)	
T3 levels				
Normal	45 (56.5%)	50 (96.2%)	95 (91.3%)	0.160
Abnormal	7 (13.5%)	2 (3.8%)	9 (8.7%)	
T 4 levels				
Normal	46 (88.5%)	48 (92.3%)	94 (90.4%)	0.741
Abnormal	6 (11.5%)	4 (7.7%)	10 (9.6%)	

*Based on Chi-square, Data are shown as abundance (%)

well.[13] These results are in concordance with our study.

In another study done by Kasumagic-Halilovic *et al.*[12] thyroid gland disorders were seen in 11.4% of the patients and no correlation between these diseases and the severity or duration of AA were seen. These results are very similar to our study.

In still another study accomplished by Ghalamkar *et al*.[16] in BooAli hospital in Tehran (2001), 70 cases were examined in 2 groups. Each group consisted of 18 female cases (51%) and 17 male cases (49%) at age 23±10 years. None of the cases in control group had thyroid disease, whereas 11.4% of cases in case group had thyroid disorders and the statistical difference was meaningful (P>0.06). The results of this study might be doubtful due to the small sample size, whereas our study has larger sample size.

Conclusion

Despite a small arithmetical difference in the frequency of thyroid dysfunctions in patients with AA and control, the results of our study rejected any association of thyroid disorders with AA.

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