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Alopecia Areata and Dry Eye

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Abstract: ***Background: There is paucity of studies reporting tear film changes and ocular surface pathologies in AA patients. Aim and Objectives: This study aims to evaluate anterior segment changes in alopecia areata patients and compare them with healthy individuals. Materials and methods: Total of 34 patients were enrolled for study with a mean age of 24.56±7.82 years. Schirmer'stest, Tear film Break Up Time (TBUT), Tear meniscus height and Optical surface disease Index (OSDI) Questionnaire were performed to assess tear film changes. Pachymetry, keratometry and slit examination to detect any corneal involvement was also done. Results: Asymptomatic punctate lenticular opacities were found in 12 (35.3%) cases and 2 (5.8%) controls. Mean values of schirmer test (in mm) was 18.59±10.15 in cases and 22.76±9.73 in controls with p=0.23 while mean values of TBUT(in seconds) was 9.59±5.49 in cases and 17.76±5.98 in controls with p=0.002. Dry eye was found in 15 (44.11%) cases and 6 (17.6%) controls with a p value 0.03, thus statistically significant. Conclusion: Alopecia areata strikes hair and Meibomian gland and spares out lacrimal gland.***

Keywords: alopecia areata, dry eye, meibomian glands

1. Introduction

Alopecia areata (AA) is a non cicatricial form of hair loss in a patchy, diffuse or confluent pattern on scalp or any hair bearing area of body. Autoimmunity, mainly T-cell-mediated is considered to play a main role in the pathogenesis of the disease[1]. AA may affect people of any age and any sex[1],[2].

AA has been found to be associated with autoimmune diseases such as vitiligo, atopic dermatitis, lichen planus, pemphigus foliaceus, Hashimoto's thyroiditis, lupus erythematosus, Addison's disease, pernicious anaemia, diabetes mellitus, Down's syndrome[3],[4].

Studies have been done reporting ocular findings in AA patients where lenticular and retinal abnormalities have been documented[5],[6]. Relatively there is paucity of studies reporting tear film changes and ocular surface pathologies in AA patients in the literature. This study aims to evaluate ocular surface changes, tear function alteration, retinal and lenticular abnormalities in AA patients and compare them with control subjects.

2. Materials and Methods

A case control study of thirty four patients with AA coming to our outpatient department over a period of 4 months along with equal number of sex and age matched controls were enrolled in the study as per the consent and protocols. The patients were examined by two dermatologists and divided into single patch, multiple patches and alopecia totalis and universalis groups. The diagnosis of AA was made based on patient history, clinical findings and by biopsy in ambiguous cases. Patients using drugs like NSAIDS, diuretics, corticosteroids, immunosuppressant, phototherapy, antidepressant, anxiolytic, anticholinergic drugs or topical eye drops within the last 3 months were excluded from the study.

Schirmer's test, Tear film Break Up Time (TBUT), Tear meniscus height were performed to assess tear film stability. In this study Optical surface disease Index (OSDI) Questionnaire was used to evaluate the symptoms and to correlate it with the results of the tests.

Pachymetry was used to measure corneal thickness. Intraocular pressure (IOP) was measured by Goldman applanation tonometry. Corneal transparency and iris pigmentary changes were examined by slit-lamp. Pupils were dilated by 1% tropicamide for detailed ophthalmoscopic lens examination.

Cases with atleast two positive results amongst these four tests (Schirmer test <10 mm wet, TBUT <10 s, OSDI >25 and tear meniscus height<1mm) were considered to have dry eye.

3. Results

Table 1: Demographic and ophthalmologic characteristics of patients with alopecia areata and control subjects.

	Case	*Control*	*P value*
Gender, male/female, n	20/14	18/16	0.8
Mean age (years)	24.56±7.82	25.81±6.09	0.61
TEAR MENISCUS HEIGHT (MM)	0.751±0.414	0.903±0.404	0.28
OSDI	26.55±10.33	10.63±7.26	<0.0001
PACHYMETRY (in µm)	524.69±24.09	527.08±22.43	0.76
KERATOMETRY (in dioptres)	45.62±2.28	45.34±2.37	0.71
Intraocular pressure, mmHg, mean±SD	15.06±2.40	15.86±2.11	0.32

Table 2: TBUT findings of patients with alopecia areata and control subjects

	Cases	*Controls*
Patients with TBUT >10 seconds, n (%)	15	29
Patients with TBUT <10 seconds, n (%)	19	5
Mean±SD values of TBUT(in seconds)	9.59±5.49	17.76±5.98
Range of TBUT (in seconds)	26-Apr	30-Jul
Median value of TBUT (in seconds)	9	18
P value	0.002	

Table 3: Schirmer test findings of patients with alopecia areata and control subjects

	Cases	*Controls*
Patients with >10 mm wetting, n(%)	24	28
Patients with <10 mm wetting, n (%)	10	6
Mean±SD values of wetting (in mm)	18.59±10.15	22.76±9.73
Range of Schirmer Test (in mm)	Apr-33	Aug-41
Median value of Schirmer Test (in mm)	21	24
P value	0.23	

Demographic & ocular data along with detailed TBUT and schirmer have been elaborated in Table 1, 2 and 3 respectively. Of the patients with alopecia areata, 8 (23.5%) patients had a single patch, 25 (73.5%) patients had multiple patches and 1 (3%) patient had alopecia universalis. 10 (29.4%) patients had madarosis and 6 (17.6%) had eyelash involvement. There was no significant association between ocular findings and type of alopecia or extent of involvement. (p value > 0.05).

Asymptomatic punctate lenticular opacities were found in 12 (35.3%) cases and 2 (5.8%) control patients with a p value <0.005, thus is considered highly statistically significant.

Dry eye was found in 15 (44.11%) cases as compared to 6 (17.6%) controls with a p value 0.03, thus statistically significant.

4. Discussion

Ocular alterations are a common manifestation in alopecia areata with the lenticular changes being a common one ranging from punctate opacities to cataract. In our study we found that lenticular opacities were found in 35.3% cases as compared to 5.8% in controls (p<0.005).Similar observations have been reported by Recupero et al[7] and Tosti[6] et al who found lenticular changes in 78% and 51% cases of alopecia areata as compared to 27% and 3% in control groups respectively while Summerly et al[8] and Bianchi et al[9] did not found any statistically significant association of lenticular opacities in alopecia areata cases versus controls. Pandhi et al[10] on examining 83 AA patients found that 20 patients had punctate opacities, 6 and 4 patients had posterior and anterior subcapsular cataract respectively. This differences in results can be as alopecia areata has been found to be associated with atopic dermatitis in which anterior subcapsular cataract is found or due to long term steroid use to treat AA which can cause posterior subcapsular cataract. In our study we did not found any cataract because patients were relatively young but found punctate opacities. Exact data regarding previous use of steroid could not be obtained.

The mean keratometric (in dioptres) and pachymetric findings (in µm) in our study are 45.62 ± 2.28 and 524.69 ± 24.09 in AA cases versus 45.34 ± 2.37 and 527.08 ± 22.43 in control group, respectively. Similar findings have been reported by Esmer et al[11] in alopecia areata patients, where he noticed keratometric findings to be in a range of 43-44 dioptres and corneal thickness of 536-538 µm in both cases and control groups. No keratoconus was seen in our study as it is seen in atopic dermatitis associated with alopecia areata.

In our study we found that the mean OSDI was 26.55±10.33 in the cases while it was 10.63±7.26 in the controls and the difference is statistically significant. Similar findings have been reported by Ergin et al[12] found OSDI of 30.92 ± 19.26 in cases and 4.43 ± 4.19 in controls. Similarly Ergin et al also reported statistically significant change in TBUT 7.94±3.49 seconds in cases and 13.5±2.65 seconds in controls, likewise as seen in our study.

In our study no statistically significant difference was found in IOP in cases and controls and similar findings have been reported by Esmer et al[11] with an IOP of 12.17 ± 2.12 and 11.89 ± 2.08 in right eye of cases and controls, respectively. Schirmer test findings were statistically insignificant in our study and similarly Ergin et al[12] found 13.72 ± 4.47mm wetting in cases and 13.05 ±2.7mm wetting in controls with p=0.55. Esmer et al[11] also found 12.17 ± 2.12mm wetting in cases and 11.89 ± 2.08mm in controls, p=0.663 in right eye and similar findings in other eye as well.

Prevalence of dry eye worldwide ranges from 5% to 35% and in India it is 29.25% as per Ocular Surface Disease Index (OSDI) data[13] and 18.4% as per another hospital based Indian study[14]. We noticed dry eye in 15 (44.11%) cases as compared to 6 (17.6%) controls with a p value 0.03.

This variation in the prevalence of dry eye may be due to the geographical, climatic and humidity alteration reigning in various places.

This wide disparity in results can be attributed to the fact as there is no standardization of objective tests, dry eye questionnaires and dry eye diagnostic criteria.

5. Conclusion

Studies with eye findings in AA patients are limited and rarely include detailed anterior segment examination which have been performed in the present study. Presence of normal schirmer test with abnormal TBUT indicate that meibomian gland are the target of T lymphocytes with lacrimal glands being spared leading to dry eye. Due to smaller sample size of this study individual findings may differ, thus larger randomised trials are required. Owing to the above findings it can be stated that alopecia areata strikes hair evidently while it hit eyes mutely.

Conflict of interest- NIL

Financial Support- NIL

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