

## OCULAR MANIFESTATIONS OF ATOPIC DERMATITIS- AN OBSERVATIONAL STUDY IN A TERTIARY CARE CENTRE IN WESTERN ODISHA

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### ABSTRACT

#### BACKGROUND

Atopic dermatitis (AD) also known as atopic eczema, is an allergic condition with hereditary predisposition. It mostly presents with intensely itchy skin, raised, splotchy lesions anywhere throughout the body. AD is most commonly seen in younger age group, the severity increases with increasing age. It is a chronic allergic condition, having both dermatologic as well as ocular manifestations. Ocular manifestations and its complications of AD are proven to be potentially morbid.

The aim of this study was to evaluate the frequencies, prevalence and pattern of ocular manifestations in patients with Atopic Dermatitis in our Tertiary eye care center in Western Odisha, so that early diagnosis and treatment of symptoms can be effectively done to prevent complications.

#### MATERIALS AND METHODS

A Hospital based observational study of Ocular manifestations in 80 cases of Atopic Dermatitis was done over 12 months. To study the frequency of ocular symptoms and its complications, a study group comprising of 49 males and 31 females were examined thoroughly. Associated ocular signs, anterior segment of eye and fundus were examined.

#### RESULTS

Atopic keratoconjunctivitis (AKC) having the maximum contribution (38.8%) followed by severe blepharoconjunctivitis (20.3%) was found in our study. Lid involvement appeared as thickening, scaling and Dennie Morgan folds, while conjunctival changes were seen in form of severe follicular and moderate to severe papillary reactions with limbal thickening. Cobblestone appearance of papillae were typically found along with papillary hypertrophy. The ocular abnormalities were mostly found in the age group of 0-10 years with an average duration of suffering from AD of >1 year. The ocular manifestations in our case group were not significantly associated with visual impairment or any serious morbidity.

#### CONCLUSION

Atopic dermatitis is a chronic allergic condition which when presents as ocular manifestations presents mostly with rubbing of eyes which eventually presents as lid thickening and scaling along with red itchy raised lesions like any other part of the body involved due to AD. The inflammatory reactions due to hypersensitivity, raised immunoglobulins like IgE and interleukins and other inflammatory mediators leads to conjunctivitis which eventually involves cornea leading to keratitis also. Complications like keratoconus, uveitis, anterior and posterior sub capsular cataract etc. were not found in our study which can be found with following up the patients for quite a longer time. The severity of the ocular manifestation can be perpetually correlated with the duration of the disease suffered by the patient. This is a condition which is mostly found in younger age group, and our study also could correlate with previous results.

#### KEYWORDS

Atopic Dermatitis, Ocular Manifestation, Atopic Keratoconjunctivitis, Blepharitis.

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#### BACKGROUND

Atopic Dermatitis also known as Atopic Eczema is a type of inflammatory skin disease which may also have ocular manifestations. It is an immediate onset or type-1 hypersensitivity reaction. This chronic pruritic disease is genetically predisposed, individuals with such predisposition has immune system dysfunction, environmental exposures and difficulties with permeability of skin.<sup>1,2</sup> Although it is a

condition with raised immunoglobulin E (IgE), bone marrow derived cell associated chromosome 11 is also found to be associated in such conditions. Abnormal skin reactivity and irritation of skin to various irritants plays a significant role in predisposing the precipitation of such inflammatory conditions repeatedly in such patients. Such patients have history of allergic reactions to various food, pollen, allergens. Many cases of AD are found to have history of Asthma and

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Allergic Rhinitis. Although no clear racial predisposition is proved yet, but cases were mostly found to be in cooler environment and preferentially in urban area. Males were found to be more affected than females in many studies so far. The occurrence of ocular manifestation is often proportionately higher than dermatological diseases. The ocular manifestation may include dermatitis of eyelids, blepharitis,<sup>3</sup> keratoconjunctivitis, keratoconus,<sup>4,5,6</sup> uveitis,<sup>5,6,7</sup> anterior and posterior subcapsular cataract,<sup>6,7,8</sup> retinal detachment.<sup>9</sup> and ocular herpes simplex.<sup>3-11</sup> Eyelids affected in AD commonly shows signs such as Dennie Morgan Infraorbital folds, Infraauricular fissures, periorbital pigmentation.<sup>12</sup> Eyelid lesions like any other lesion in the body in this condition are found to be itchy, red, raised lesions due to constant and repetitive rubbing of eyelids and lid margins as well. Conjunctival reactions such as follicular and papillary hypertrophy and cobblestone papillary reactions are well marked in many cases of AD. It might be potentially blinding or morbid due to complications arising from severe and repetitive itching of eyes like keratoconus. This article efforts in evaluating various ocular disorders, figuring out their frequencies, prevalence and patterns, with due permission from the ethical committee of our institution, so that early diagnosis and treatment of symptoms can be effectively done to prevent complications.

**Aim-** To evaluate various ocular manifestations in patients of Atopic Dermatitis, their frequencies, prevalence and patterns, so that early diagnosis and treatment of symptoms can be effectively done to prevent complications.

## MATERIALS AND METHODS

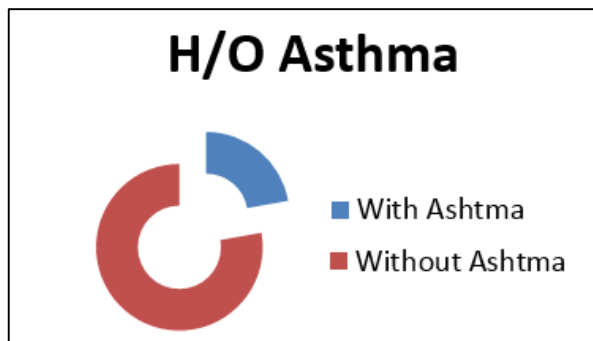
A Hospital based prospective study of 80 patients diagnosed as Atopic Dermatitis in Dermatology Department of a tertiary care center in Western Odisha were taken up for the study and evaluated in ophthalmology department of the same center for a period of 12 months i.e. from June 2016 to May 2017. A thorough history, including symptoms, onset, progression, duration of disease, associated symptoms, history of similar attacks in past, frequency, demographic profile, environmental exposure to allergens, history of asthma, family history, personal history, food allergy, drug allergy, other treatment history like antihistamines, steroids, emollients, sulfones, antibiotics etc. were recorded. Detailed ocular torch light examination, slit lamp examination, visual acuity, fluorescent dye staining, Intra Ocular Pressure with Applanation Tonometry, perimetry in selective cases and Schimer's test were done. Dilated eye

examination for cataractous changes and Fundus examination with Indirect Ophthalmoscopy and 90D Biomicroscopy were performed. Investigations included Routine examination, ESR, Serum IgA and Serum IgE in selected patients. All cases of conjunctivitis were treated with topical decongestant and lubricating eye drops. Cases found to be with Blepharitis were classified into squamous and ulcerative types. Squamous Blepharitis were advised for cleaning of lashes with 3% sodium bicarbonate lotion and in some cases in which infection are found to be superadded appropriate topical antibiotics drops and ointments were prescribed. In cases of Ulcerative Blepharitis cleaning of lashes was advised with 3% sodium bicarbonate lotion and topical antibiotic drops and ointments were prescribed and followed up. Keratoconjunctivitis cases were dealt with topical antihistaminic drops, tapering steroid eyedrops, tacrolimus eye ointments. Selective cases were treated with topical antibiotics eye drops. Few cases with recurrent attacks were also prescribed with topical mast cell stabilizers and topical antihistaminic eye drop for prophylaxis and are followed up. Cases of Vernal keratoconjunctivitis were treated with mast cell stabilizers like topical sodium cromoglycate eye drops, olopatadine eye drops and topical antihistamines eye drops. In some refractory cases we prescribed low potent steroid eye drops and tacrolimus eye ointment and then cases were followed up. Visual Acuity at the time of presentation were recorded and followed up after 3 months and 6 months of treatment. The study included all the patients with AD below 20 years of age and excluded patients above 20 years.

## RESULTS

Out of 80 patients including 49 males and 31 females, 54 cases showed ocular manifestations. Of them 28 were males 26 were females, males succeeding females by 3.7% as clearly described in Chart 1. The mean age of presentation is 8 years. The age group with maximum cases were found to be within 0-10 years. 44 patients were found to be of less than 10 years out of 54 patients (81.4%), which is a significantly higher number. Total number of males in the age group of 0-5 years were 14 and females being less in number, 12 out of 26 patients who were affected in this age group. But at the age group of 6-10 years the pattern changes and female patients affected were found to be 10 and male being 8 in number out of a total of 18 children with ocular symptoms and signs. And the male: female ratio remained comparatively higher in the subsequent age groups of 11-15 years and 16-20 years with 4:3 and 2:1 respectively. As described in Chart 2, the pattern of distribution of ocular manifestation among male and female with respect to different age groups signifies an increase in frequency of ocular manifestation in Atopic Dermatitis patients in males with increasing age of presentation of ocular symptoms. In our study it was also found that most of the cases presenting to eye OPD for the ocular manifestations of Atopic Dermatitis were suffering from AD for a duration of >1 year. Around 36 patients were diagnosed and were being treated for Atopic Dermatitis for

>1 year and then presented with ocular symptoms subsequently. Many cases had family history of Atopic Dermatitis, Asthma, and Allergic Rhinitis also. Chart 3 shows percentage of cases with ocular manifestation and history of Asthma. Out of 54 cases with ocular manifestation 12 cases (22%) were known cases of Asthma and 6 among them had been treated before for acute attack of Asthma in childhood and 4 of them were on prophylactic treatment for Asthma.

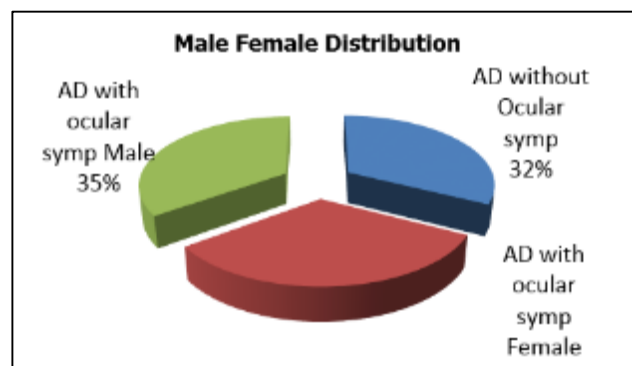


**Chart 3. Percentage of Cases with ocular Manifestation with H/O Asthma**

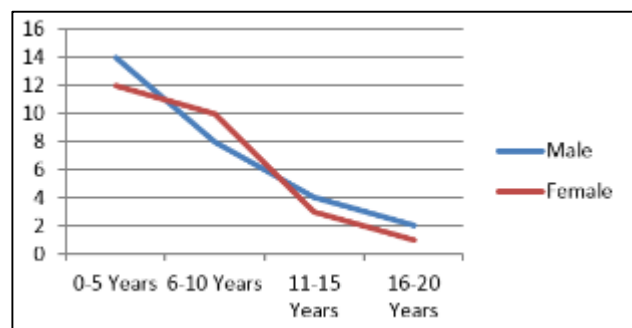
In this study it was found that 22 patients presented with Blepharitis only (40.7%), 21 patients presented with Atopic Keratoconjunctivitis (38.8%) and Blepharoconjunctivitis patients counted 11 in numbers (20.3%). As shown in table 2, age group of 0-5 years has the maximum number of cases with 26 patients followed by 6-10 years of age group having 18 out of total number of cases. This count was followed by 7 cases in the age group of 11- 15 years and only 3 cases in 16-20 years of age group. Figure 1-3 and figure 5 shows cases with various ocular manifestations in already diagnosed cases of Atopic Dermatitis. Figure 4 shows a 3 year old child diagnosed as Atopic Dermatitis and presented to Eye OPD of our Tertiary care center with itching and foreign body sensation of both eyes for past 1 month, later diagnosed with allergic conjunctivitis of both eyes and treated appropriately with topical mast cell stabilizers and antihistamines eye drops. Visual acuity of the patients were recorded at the time of presentation, after 3 months of treatment and then 6 months of treatment. No significant changes could be seen in visual acuity of patients even after treatment.

Age Group	Ocular Manifestation Absent (n=26)	Ocular Manifestation Present (n=54)		
		Male	Female	Total
0-5 years	10	14	12	26
6-10 years	5	8	10	18
11-15 years	8	4	3	7
16-20 years	3	2	1	3
<b>Total</b>	<b>26</b>	<b>28</b>	<b>26</b>	<b>54</b>

**Table 1. Age and Sex Distribution of Ocular Manifestations in AD**



**Chart 1. Male Female Distribution amongst Patients of AD Showing Ocular Manifestation**



**Chart 2. Number of Cases Distributed as Male and Female with Respect to Groups**



**Figure 1. Atopic Keratoconjunctivitis**

Age Group	Lid involvement Only	Conjunctiva Involvement Only	Lids +conjunctiva Involvement	Total
0-5 years	8	10	8	26
6-10 years	10	8	0	18
11-15 years	4	2	1	7
16-20 years	0	1	2	3

**Table 2. Anatomical Distribution in Eye in Various Age Groups in AD Patients**



**Figure 2. Papillary reaction**



**Figure 3. Atopic Dermatitis**



**Figure 4. VKC**



**Figure 5. Blepharitis**

## DISCUSSION

AD being chronic allergic conditions commonly presents with recurrences has both dermatologic as well as ocular manifestations. Although our study did not prove that ocular manifestations in Atopic Dermatitis patients are potentially morbid or blinding, as severe ocular complications are not documented in such patients in a duration of 12 months of study, but it surely could relate the increasing prevalence of ocular manifestations in AD patients and its severity with the duration of illness. In our study, of 80 patients, 54 cases showed ocular manifestation. It was observed that, eye involvement is more common in males than females as evidenced in previous studies.<sup>13</sup> We found out that the mean age of presentation is 8 years. The age group with maximum cases were found to be in 0-10 years. Almost all cases were found to have disease process of more than 1 year.<sup>13</sup> As compared to previous studies in which changes in eyelid have been reported as 16-62.2% of AD patients.<sup>7,14</sup> our study of 80 patients, out of which 54 patients showed ocular manifestation showed (67.5%). This study also showed blepharitis in 22 cases (40.7%), Keratoconjunctivitis in 21 cases (38.8%) and Blepharoconjunctivitis in 11 cases (20.3%).<sup>13</sup> Several authors like Christensen found 6%,<sup>10</sup> Amemiya et al observed 31.8%.<sup>11</sup> and Foster et al reported 64.2% conjunctivitis in their studies.<sup>7</sup>

## CONCLUSION

Our study was done in a tertiary care hospital in western Odisha to find out the prevalence of ocular manifestation in AD patients, which showed male children preponderance, but were not associated with significant ocular morbidity or visual impairment. However more number of cases and further studies are required to derive a definitive conclusion.

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