ORIGINAL RESEARCH

A study on clinical profile of patients with allergic conjunctivitis

[1]Dr. SoumyaPatil,[2]Dr. Rakesh Anjenappa, [3]Dr. Guru Prasad N S,[4]Dr. Shubha V

[1]Cornea Refractive Fellow, Minto Hospital, BMCRI, Bangalore, Karnataka, India
[2]Post Diploma DNB, BharathrathnaDrBabasahebAmbedkar Memorial Hospital, Central Railway, Byculla, Mumbai, India
[3]Phacorefractive Fellow at Prasad Nethralaya, Udupi, Karnataka, India
[4]Medical Officer, ESI Hospital, Bangalore, Karnataka, India

Corresponding Author
Dr.Guru Prasad N S
Phacorefractive Fellow at Prasad Nethralaya, Udupi, Karnataka, India

Received: 11Aug, 2023 Accepted: 03Sept, 2023

ABSTRACT
Allergic conjunctivitis is an increasingly prevalent allergic reaction having clinical gravity similar to asthma and allergic rhinitis. Currently around 40% of global population is suffering from allergic conjunctivitis. After obtaining approval and clearance from the Institutional ethics committee, the patients diagnosed with allergic conjunctivitis and those fulfilling the inclusion criteria were enrolled for the study after obtaining informed consent. A full medical and ocular history was taken on Case record form with follow up chart. The differences in mean age and gender distribution were not statistically significant (p value for Alcaftadine was 0.17 and Bepotastine was 0.502). The data reveals that most of the participants in the Alcaftadine group (n=37, 69.81%) and in the Bepotastine group, (n=35, 66.04%) did not have any similar episodes of allergic conjunctivitis in the past while 16 participants (30.19%) in the Alcaftadine group and 18 participants (33.96%) in Bepotastine group had similar episodes in the past.

Key words: Allergic conjunctivitis, alcaftadine, bepotastine

INTRODUCTION

Allergic conjunctivitis (AC) refers to the inflammation of the conjunctiva with an underlying allergic cause, manifesting itself most commonly as ocular itching and conjunctival hyperemia. It has been found that 94% of patients with allergic conjunctivitis may also have allergic rhinitis symptoms like nasal itching and rhinorrhea.[1]As allergic conjunctivitis occurs usually alongside rhinitis; the term rhino conjunctivitis is often used interchangeably to refer to both of these conditions.[2]

These symptoms create a negative impact on patient's ocular and nasal comfort and result in disruption and restriction of day-to-day activities and also increases economic burden.[1] Prevalence of allergic conjunctivitis in the above 18 age group in south India has been found to be 12.5%.[3]

Allergic conjunctivitis is an increasingly prevalent allergic reaction having clinical gravity similar to asthma and allergic rhinitis. Currently around 40% of global population is suffering from allergic conjunctivitis[4].

Exposure to particulate matter less than 2.5 μm can lead to allergic reactions. The prevalence of allergic conjunctivitis was found to be 40%, 32%, 25.5% and 20% in Japan, Africa, India and USA respectively. High level of allergy in India is because of high pollution levels in thecountry. The prevalence is common among childrenstudying in government schools due to poor hygiene.[5]

Allergic conjunctivitis commonly occurs due to a type I hypersensitivity reaction which is triggered by allergen antigen exposure. After a previously sensitized individual comes into contact with the same allergen, cross-linking of complementary IgE on the conjunctival mast cell surface occurs which triggers the mast cell degranulation which causes the release of histamine. This is known as the early-phase response of allergic conjunctivitis and it is characterized by ocular itching, redness and chemosis. After 6 to 12 hours later this is followed by a late phase reaction involving conjunctival infiltration of inflammatory cells like eosinophils. In this late phase, the reaction can cause tissue damage and severe allergic inflammation of the conjunctiva can occur.[1]

Allergic signs and symptoms result from a cascade of immune responses following the first exposure of a genetically predisposed individual to an allergen

through a process called sensitization. Macrophages and neutrophils recognize antigens by toll like receptors (TLR) on cell surface that are specific for allergen structures. TLR stimulates the antigen-presenting cells which leads to the activation and priming of antigen-specific naive T cells. Activated T cells produces cytokines that, in turn, regulate the synthesis of immunoglobulin E (IgE) and eosinophil proliferation.[6]Activated T cells interact with B lymphocytes that have encountered the same allergen and this interaction results in the release of additional T-helper cytokines such as interleukin (IL)-4. B-cell activation leads to the production of allergen-specific IgE class immunoglobulins that bind to high- affinity IgE receptors present on mast cells and basophils. As a result, the immune cells become 'primed' to initiate the allergic response upon re-exposure to the same allergen.[7] Upon exposure of the ocular surface to same allergen to which an individual has become sensitized, this crosslinking causes mast cells to degranulate and release inflammatory mediators like histamine which is responsible for ocular itching, redness, inflammation, watering and chemosis, etc.

The inflammatory mediators that contributes to the signs and symptoms of SAC include the presynthesized mediator histamine that triggers the early phase of the allergic response, as well as the newly synthesized prostaglandins, leukotrienes and other inflammatory mediators that cause secondary inflammatory cascade known as the late-phase allergic response. Histamine acts via multiple subtypesof the histamine receptor, although only H1 and H2 receptors have been identified in the conjunctiva. The majority of the ocular allergic reaction occurs via activation of H1 receptors by histamine, which elevates intracellular inositol phosphate, which increases intracellular calcium and leads to the symptom of pruritus as well inflammatory cytokine secretion. Activation of H2 receptors causes vasodilation that result in ocular redness. The effects of histamine binding to H1 and H2 receptors in the conjunctiva include Hyperaemia, oedema, fibroblast cell proliferation, cytokine secretion and increased micro-vascular cell permeability.[8] The presence of proinflammatory mediators, prostaglandins and leukotrienes in the tear fluid is associated with the itching, redness, watering and mucous discharge that occur with SAC. Prostaglandins causes the increase in microvascular permeability that causes ocular surface Hyperaemia, amplifies the pruritogenic effects of histamine as well as stimulates goblet cell that leads to mucus hypersecretion. Prostaglandin-2 also stimulates eosinophil infiltration, leading to further inflammation as part of the late phase of the allergic reaction. Leukotrienes are found in high concentrations in tear fluid following allergen exposure along with prostaglandins enhances vascular permeability and oedema formation. Matrixmetalloproteinases (MMPs) that degrade all components of the extracellular matrix are involved in inflammation related to eosinophil migration during allergic inflammation and have been found in high concentration in tears of patients with SAC.[9] Allergic conjunctivitis is characterized by the infiltration of inflammatory cells into the conjunctiva in approximately 25-43% of patients with SAC. This infiltration of inflammatory cells into the conjunctiva occurs because of release of inflammatory mediators such as tumor necrosis factor alpha (TNFa), which up-regulates adhesion molecules such as intercellular adhesion molecule(ICAM)-1.ThecytokineIL-4playsakeyroleincontinuedinflammation during the late phase of the ocular allergic response through the promotion of T-cell growth, induction of IgE production from B cells, upregulation of adhesion molecules and regulation of T-helper type 2 (Th2) cell differentiation. IL-4 also promotes eotaxin expression and secretion from corneal stromal keratocytes and conjunctival fibroblasts, which preferentially attracts eosinophils. Activation of these cells causes the release of additional inflammatory mediators and the propagation of the inflammatory response. A higher proportion of conjunctival infiltration of cellular components is present in the common form of SAC compared with allergic rhinitis.[10]

METHODOLOGY

A. STUDY DESIGN

Prospective randomized comparative study.

B. INCLUSION CRITERIA

1. Patients of Allergic conjunctivitis attending Regional Institute of Ophthalmology, Minto Ophthalmic Hospital, Bengaluru diagnosed with Allergic conjunctivitis. On basis of:

i) Itching, watering and photophobia (sensitivity to light).

ii) All subjects agreed to avoid disallowed medication and to discontinue contact lenses.

C. EXCLUSION CRITERIA

1. Patients with any known allergy or contraindication to study medication.
2. Ocular surgery within 3 months or refractive surgery within 6 months.
3. Contact lenses users.
4. Patient already in treatment with systemic steroids and other immunosuppressive drugs in past 6 months.
5. Patients already using topical anti allergic drugs.

METHODOLOGY

After obtaining approval and clearance from the Institutional ethics committee, the patients diagnosed with allergic conjunctivitis and those fulfilling the inclusion criteria were enrolled for the study after obtaining informed consent. A full medical and ocular history was taken on Case record form with follow up chart.

It was a prospective randomized comparative study in which 106 cases of allergic conjunctivitis were included in the study and divided equally into two groups based on systemic random sampling. One group was treated with Bepotastine 1.5% eye drop twice daily and the other with Alcaftadine 0.25% eye drop twice daily.

A thorough evaluation of all the study subjects was taken by detailed history taking followed by general, systemic and ocular examination at base line visit. Follow-up was done at zero-day, one week and 4th week regarding number of patients for itching, Hyperaemia, watering and photophobia by using four-point scale method.

During the study period if any patient complaint regarding any side effect of eye drops was instructed to contact immediately in OPD.

RESULTS

Table 1: Comparison of Mean Age between Genders

Gender	Alcaftadine		Bepotastine	
	N	Mean±SD	N	Mean±SD
Male	35	25.29±14.584	26	29.44±11.950
Female	18	31.11±14.536	27	27.31±10.997
Total	53	27.26±14. 69	53	28.4±11.433
P value*		0.17		0.502

*Student 't' test

Table 2: Distribution of Religion

Religion	Alcaftadine	Bepotastine	Total
	N (%)	N (%)	N (%)
Hindu	34 (64.15)	31 (58.5)	65 (61.3)
Muslim	19 (35.85)	22 (41.5)	41 (38.7)
P value†	0.34		

† Chi square test

Table 3: Distribution of Occupation

Occupation	Alcaftadine	Bepotastine	Total
	N (%)	N (%)	N (%)
Professional	4 (7.55)	9 (16.98)	13 (12.26)
Semi Professional	3 (5.66)	3 (5.66)	6 (5.66)
Clerical, shop-owner/farm	2 (3.77)	1 (1.89)	3 (2.83)
Skilled Worker	8 (15.09)	9 (16.98)	17 (16.04)
Semiskilled Worker	6 (11.32)	1 (1.89)	7 (6.60)
Unemployed	30 (56.60)	30 (56.60)	60 (56.60)
Total	53 (100)	53 (100)	106 (100)

Table 4: Distribution of Education Level

Education Level*	Alcaftadine	Bepotastine	Total
	N (%)	N (%)	N (%)
Post Graduate/Professional	3 (5.66)	6 (11.32)	9 (8.49)
Graduate	12 (22.64)	16 (30.19)	28 (26.42)
Higher Secondary	8 (15.09)	4 (7.55)	12 (11.32)
High School	15 (28.30)	16 (30.19)	31 (29.25)
Middle School	6 (11.32)	1 (1.89)	7 (6.60)
Primary	9 (16.98)	10 (18.87)	19 (17.92)
Illiterate	0	0	0
Total	53 (100)	53 (100)	106 (100)

† Chi Square Test

According to Revised Kuppuswamy's Socioeconomic Status Scale66.

Table 5: Distribution of Allergic Conjunctivitis Episodes in the past

	Alcaftadine	Bepotastine	Total
	N (%)	N (%)	N (%)
Present	16 (30.19)	18 (33.96)	34 (32.08)
Absent	37 (69.81)	35 (66.04)	72 (67.92)

Total	53 (100)	53 (100)	106 (100)

Table 6: Distribution of Comorbid Conditions

	Alcaftadine	Bepotastine	Total
	N (%)	N (%)	N (%)
DM	1 (1.89)	0	1 (0.94)
HT	1 (1.89)	3 (5.66)	4 (3.77)
DM & HT	1 (1.89)	2 (3.77)	3 (2.83)
Absent	50 (94.34)	48 (90.57)	98 (92.45)
Total	53 (100)	53 (100)	106 (100)

Table 7: Distribution of History of Allergies

	Alcaftadine	Bepotastine	Total
	N (%)	N (%)	N (%)
Allergic Rhinitis	8 (15.09)	11(20.75)	19(17.92)
Dust Allergy	6 (11.32)	10 (18.87)	16 (15.09)
Skin Allergy	1 (1.89)	2 (3.77)	3 (2.83)
Sinusitis	2 (3.77)	1 (1.89)	3 (2.83)
Atopic Dermatitis	1 (1.89)	0	1 (0.94)
Asthma	1 (1.89)	0	1 (0.94)
Absent	34 (64.15)	29 (54.72)	63 (59.43)
Total	53 (100)	53 (100)	106 (100)

DISCUSSION

The mean age in the Alcaftadine group was 27.26±14 and 28.40±11.43 years in the Bepotastine group. The Alcaftadine group consisted of 35 male (66.03%) and18female (33.96%) participants. In the Bepotastine group, 26 male (49.05%) and 27female (50.94%) participants were recruited. The differences in mean age and gender distribution were not statistically significant (p value for Alcaftadine was 0.17 and Bepotastine was 0.502).

The distribution of religion among the total 106 participants enrolled in the study shows that there was no statistically significant difference between two study groups in this regard. (p value 0.34). Most of the participants were Hindu in both the Alcaftadine and Bepotastine groups. The religion of the remaining participants was Muslims.

In the Alcaftadine group 56.6% (n=30) were unemployed and 15.09% (n=8) were skilled workers. In the Bepotastine group, 56.60% (n=30) were unemployed and 16.98% (n=9) were skilled workers.

In the Alcaftadine group, 28.3% (n=15) of the participants were graduates and in Bepotastine group, 41.5% (n=22) of the participants were graduates. Most of the study participants were educated (at least till the primary education) in both the study groups.

Past history of allergic conjunctivitis in the study participants as indicated by the number of episodes of allergic conjunctivitis and there was no statistically significant difference between two study groups in this regard (p value 0.169). The data reveals that most of the participants in the Alcaftadine group (n=37, 69.81%) and in the Bepotastine group, (n=35, 66.04%) did not have any similar episodes of allergic conjunctivitis in the past while 16 participants (30.19%) in the Alcaftadinegroup and 18 participants (33.96%) in Bepotastine group had similar episodes in the past.

The participant's with presence of history of allergy (n=19, 35%), in the Alcaftadine group. In the Bepotastine group, the participant's with history of allergy (n-24, 45%).

CONCLUSION

- There is no Statistically significant difference in gender and religion in both the groups
- Majority of patients have co existing history of non-ocular allergies

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