Therapeutic Efficacy of Topical Olopatadine 0.1% Versus Ketotifen Fumarate in Allergic Conjunctivitis

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ABSTRACT

Objective: To compare the therapeutic efficacy of topical Olopatadine 0.1% versus Ketotifen Fumarate among the patients diagnosed with allergic conjunctivitis at Armed Forces Institute of Ophthalmology.

Study Design: Prospective comparative study.

Place and Duration of Study: Armed Forces Institute of Ophthalmology, Rawalpindi Pakistan, from Jan 2020 to Jan 2021.

Methodology: Patients diagnosed with allergic conjunctivitis by consultant ophthalmologist fulfilling the exclusion/inclusion criteria were included in the study. They were divided into two groups by block randomization with group A receiving Olopatadine 0.1%, while group B just received the Ketotifen Fumarate. Symptoms were assessed on a symptom severity score upon diagnosis before the start of medication and then after 72 hours of treatment by a different consultant ophthalmologist who was unaware of the group of patients.

Results: A total of 100 patients were included in each group. The mean age of the study participants was 30.944 ± 3.349 years. 148 (74%) patients were males while 52 (26%) were females. The difference in mean score of symptoms in group A was 5.76 ± 1.39 while in group B was 3.33 ± 2.51. Application of t-test revealed that topical Olopatadine 0.1% was superior to Ketotifen Fumarate in reducing the symptoms of acute allergic conjunctivitis on the third day of treatment (p-value<0.001).

Conclusion: Seasonal allergic conjunctivitis was the commonest type of allergic conjunctivitis seen in our study participants. Topical Olopatadine 0.1% emerged as a better treatment option when compared to Ketotifen Fumarate for immediate management of acute allergic conjunctivitis among patients managed at a tertiary care ophthalmology hospital.

Keywords: Allergic conjunctivitis, Efficacy, Ketotifen fumarate, Olopatadine 0.1%.

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INTRODUCTION

Allergic conjunctivitis (AC) is an inflammation of conjuctiva which may occur when conjunctiva comes in contact with any antigen in the air. Seasonal allergic conjunctivitis and perennial allergic conjunctivitis usually encountered by the clinicans and are more common than other types.[1] Seasonal allergic conjunctivitis is an acute condition manifesting as ocular itching, redness in the conjunctiva (hyperemia) and burning sensations in eyes.[2,3] Role of mast cells is well established in pathogenesis of this ocular condition. Release of histamine and other inflammatory markers ocuur from mast cells when they come in contact with the antigen. Main culprit chemical for the symptoms of AC is histamine and if its action is not encountered, symptoms may get worse.[4] Allergic conjunctivitis if not managed in time leads to compromised over all quality of life of individual.[5,6]

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Topical antihistamines and mast cell stabilizers have been main stay of treatment for allergic conjunctivitis.[7] Agents with dual mechanism of action i.e. stabilizing the mast cells and preventing degranulation cater for both short term and long term signs and symtoms of AC. Commonly used options from this class include Ketotifen fumarate (KF) and olopatadine hydrochloride (OHCL).[8] Aguilar *et al*, compared these two drugs in terms of efficacy and adverse effects for management of AC. Short term and long term improvement in symtpoms of allergic conjunctivitis was noted in all the patients included in their study and were comparable in both the groups.[8] A randomized controlled trial published by Ganz *et al*, concluded that he efficacy of ketotifen was higher than olopatadine on day 5 (88% vs 55%) and day 21 (94% vs 42%).[9] Another study concluded that there is no significant difference in efficacy of olopatadine hydrochloride 0.1% ophthalmic solution and ketotifen fumarate (KF) in the management of allergic conjunctivitis having efficacy of 73.3% vs 73% 7th day and 89.2% vs 86.5% on 28th day respectively.[10]

Currently available literature showed that there is no consensus among researchers that which drug is better and different studies had different results. Therefore, this study would be a contribution towards adopting more efficient drug for the treatment of this disease. The rationale of this study was to compare the therapeutic efficacy of topical olopatadine 0.1% versus ketotifen fumarate among patient suffering from allergic conjunctivitis.

METHODOLOGY

This prospective comparative study was conducted at the Armed forces institute of Ophthalmology, Rawalpindi, from January 2020 to January 2021. The sample size was 62 i.e. 31 for each group. P1= efficacy of Ketotifen Fumarate as 88% and P2=efficacy of Olopatadine 0.1% in allergic conjunctivitis as 55% based on the previous study.[9] Significance level was 5% and power was 95% under the WHO sample size calculation formula. A consecutive non-probability sampling technique was used to recruit the study participants.

Inclusion Criteria: Patients of both genders with ages between 18 and 60 years and having moderate to severe ocular itching and hyperemia were included in the study.

Exclusion Criteria: Patients presenting with conjunctivitis with other associated ocular pathologies like asthma, eczema, dry infective conjunctivitis, uveitis or eczema) or history of ocular surgery or contact lens use were excluded from the study. Patients receiving systemic or topical ocular medication or pregnant women were also part of the exclusion criteria.

After approval from the institutional ethical committee via letter-number ERC-214/12, all the patients who attended the AFIO outpatient department with complaints, including ocular itching, hyperemia, tearing, photophobia having a clinical diagnosis of AC based on the abnormal clinical sign,[11] of hyperemia on slit-lamp examination,[12] were included in the study according to above-mentioned selection criteria. Written informed consent was taken from them for including them in the study. They were grouped by block randomization as group A (Olopatadine 0.1% group) and group B (Ketotifen Fumarate group). A detailed history and clinical examination were performed. Clinical signs and symptoms like hyperemia, tearing, itching & photophobia scores were noted before treatment in both groups. Each patient received one drop of respective ophthalmic solution in each eye every,[12] hours. On 3rd day the clinical signs and symptoms (hyperemia, tearing, itching & photophobia scores) were noted in both groups. All the data was recorded like name, age, sex, scores for various signs & symptoms, etc. on a pre-designed proforma. Scoring of signs and symptoms of allergic conjunctivitis pre and post-treatment was performed as under (Table-I).[4,13]

Table-I: Scoring of signs and symptoms of allergic conjunctivitis.

Sign/ Symptoms	Score 0	Score 1	Score 2	Score 3
	Absent	Mild	Moderate	Severe
Itching	Absent	Occasionally	Frequently	continuously
Hyperemia of conjunctiva	Absent	Slightly dilated blood vessels	Moderate vasodilatations	Dilated blood vessels deep red
Tearing	Absent	Occasionally	Frequently	Persistent
Photophobia	Absent	Occasionally	Continuous	The eye responds with blepharospasm on exposure to light

All the analysis was done in Statistical Package for Social Sciences (version 23). Mean and standard deviation was computed for variables like age, and total symptoms score before and after the use of both ophthalmic solutions for both groups. Frequency and percentages was calculated for variables like gender, and types of allergic conjunctivitis. Therapeutic efficacy in both groups was assessed by seeing the statistical difference in difference in mean symptoms scores of both groups by t-test keeping p-value ≤0.05 as significant.

RESULTS

A total of 200 patients were included in the study making 100 patients in each group after block randomization. The mean age of the study participants was 30.94 ± 3.34 years. 148 (74%) patients were male while 52 (26%) were female. Table-II showed the general characteristics of the patients. Seasonal allergic conjunctivitis was the commonest 104 (52%)type of allergic conjunctivitis seen in our study participants followed by perennial allergic conjunctivitis 78 (39%), keratoconjuctivitis 12 (6%) and vernal keratoconjuctivitis 6 (3%). The difference in the mean score of symptoms in group A was 5.76 ± 1.39 while in group B was 3.33 ± 2.51.

Table-III showed the findings of t-test. It was revealed that topical Olopatadine 0.1% was superior to

Ketotifen Fumarate in reducing the symptoms of acute allergic conjunctivitis on the third day of treatment (*p*-value <0.001) as mean score of symptoms in group A was 5.76 ± 1.39 while in group B was 3.33 ± 2.51.

Table-II: Characteristics of study participants.

Study Parameters	n (%)
Age (years)	
Mean ± SD	30.944 ± 3.34 years
Range (min-max)	20 years - 59 years
Gender	
Male	148 (74%)
Female	52 26%)
Difference in mean symptoms score	
Group A	5.76 ± 1.39
Group B	3.33 ± 2.51
Types of Allergic conjunctivitis	
Seasonal allergic conjunctivitis	104 (52%)
Perennial allergic conjunctivitis	78 (39%)
Keratoconjunctivitis	12 (6%)
Vernal Kerato-conjunctivitis	6 (3%)

Table-III: Comparison of difference in symptoms severity score in both groups.

	Group A	Group B	*p*-value
Difference in mean scores	5.76 ± 1.39	3.33 ± 2.51	<0.001

DISCUSSION

Allergic conjunctivitis is a common ophthalmology condition encountered by general physicians as well as ophthalmologists. Usually, it's a benign condition with a good prognosis but it may affect the quality of life of patients and early diagnosis and management may reduce the morbidity associated with this condition.[11] Local and foreign studies have revealed that it is a prevalent condition among all age groups.[14,15] Topical therapy has usually been the treatment of choice and various agents have been tried for this purpose. Due to limited local data available for the most suitable medication for this condition we performed this study with the objective to compare the therapeutic efficacy of topical Olopatadine 0.1% versus Ketotifen Fumarate among the patients diagnosed with allergic conjunctivitis at the Armed Forces Institute of Ophthalmology.

Patel *et al*,[16] published a study, from India which spanned over 1.5 years regarding the use of topical Olopatadine Hydrochloride versus Ketotifen Fumarate for allergic conjunctivitis. They concluded that scores of itching, tearing, redness, eyelid swelling, chemosis, and papillae addition reduced significantly by the 4th and 15th days of Olopatadine and Ketotifen application and Olopatadine was clearly superior to Ketotifen in this regard. We check the same scores on 3rd day of treatment and compared the same agents. Our results supported the findings of Patel *et al*, as Olopatadine was found superior to ketotifen.

Kam *et al*,[17] published an interesting meta-analysis in this perspective comprising of randomized-controlled trials that included patients with allergic conjunctivitis and compared olopatadine versus placebo or alternative anti-allergic medications. They came up with the findings that when compared with placebo, topical olopatadine was highly effective in reducing ocular itch and ocular hyperemia. When compared with other agents, Olopatadine was inferior to alcaftadine on ocular itch but comparable with Epinastine and Ketotifen. Our findings suggested that it is not only effective but superior to ketotifen.

Leonardi *et al*,[18] published a study comparing patients preference regarding use of olopatadine and ketotifen for treatment of allergic conjunctivitis. Results of their study showed that most patients selected olopatadine based on their understanding of efficacy and tolerability. It was an interesting study because authors didn't target clinical parameters directly. Our study design was different and it was more a clinician observed response on the third day of treatment with both the agents but still our findings were not very different and olopatadine was clearly superior in reducing the symptoms of allergic conjunctivitis as compared to ketotifen.

LIMITATIONS OF STUDY

Recruiting the patients from one ophthalmology insititue was one of the important limitations in our study. Baseline charecteristics of patients were not matched for both groups which may cause confounding factors to interfere with the associations established in the study. Future studies with better design preferably randomized controlled trials with longer follow up of patients may generate better and generalizable results.

CONCLUSION

Seasonal allergic conjunctivitis was the commonest type of allergic conjunctivitis seen in our study participants. Topical Olopatadine 0.1% emerged as a better treatment option when compared to Ketotifen Fumarate for immediate management of acute allergic conjunctivitis among patients managed at a tertiary care ophthalmology hospital.

Conflict of Interest: None.

Authors' Contribution

FUA: Conception, data collection and analysis, MHS: Statistical and interpretation, HJ: Data collection and manuscript drafting, AK: Research supervision and approval, SK: Con-

ception and research analysis, HJ: Conception and research analysis.

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