

Expert Perspectives on the Clinical Practices and Treatment Preferences in the Management of Allergic Conjunctivitis in Indian Settings

Keywords: Allergic conjunctivitis; Seasonal Allergic Conjunctivitis; Perennial Allergic Conjunctivitis; Antihistamines; Alcaftadine; Fluorometholone; Loteprednol

Abstract

Objective: To assess the clinical practice and treatment preferences in allergic conjunctivitis (AC) among ophthalmologists in Indian healthcare settings.

Methods: This cross-sectional study included ophthalmologists practicing in India. A multiple-response questionnaire comprising 23 questions was employed to collect feedback, clinical observations, and experiences related to the management of AC and the routine use of antihistamines. The data were analyzed using descriptive statistics.

Results: The study included 212 participants, and the majority of them (34.91%) preferred alcaftadine for treating AC in children. Half (50%) of the respondents identified alcaftadine as their antihistamine of choice in routine practice. For managing AC in adults, around 36% favored topical steroids such as fluorometholone or loteprednol. In severe cases, approximately 59% preferred these topical steroids as add-on therapy. Alcaftadine was selected by 38% as the preferred treatment for seasonal AC (SAC) and perennial AC (PAC). For vernal keratoconjunctivitis (VKC), 57% favored topical steroids like fluorometholone or loteprednol, while 50% preferred them for atopic keratoconjunctivitis (AKC). In refractory cases of VKC or AKC, 43% preferred loteprednol. Additionally, more than half (52.83%) preferred alcaftadine for treating AC in lactating women.

Conclusion: This study highlights distinct clinician preferences in the management of AC. Alcaftadine was favored for children, SAC/PAC, and lactating women, while topical steroids (fluorometholone and loteprednol) were preferred for adults and severe cases, including VKC and AKC. Loteprednol was particularly preferred in refractory VKC/AKC cases.

Introduction

Allergic conjunctivitis (AC) is a common ocular condition, affecting up to 40% of the population, and is frequently seen by ophthalmologists and cornea specialists. Its global prevalence has risen over the past decade, making it one of the most commonly encountered conditions in clinical practice. However, prevalence rates vary widely across and within countries, likely due to the heterogeneous nature of the disease and differences in ethnicity, allergen exposure, and environmental risk factors. [1,2] It can significantly impact work performance, educational productivity, and



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overall quality of life. The resulting economic burden is substantial, highlighting the need for targeted health and welfare policies to address these challenges.[2]

AC affects 6–30% of the general population and up to 30% of children, either alone or alongside allergic rhinitis.[2] It is a leading cause of ocular morbidity in children and adolescents, increasingly recognized as one of the most common pediatric eye disorders. Seasonal and perennial AC (SAC and PAC) account for 74–95% of cases, while the less common but more severe forms, vernal keratoconjunctivitis (VKC) and atopic keratoconjunctivitis (AKC), pose greater clinical challenges.[3]

The majority of AC cases require pharmacological management. Dual-acting agents, which both block histamine receptors and stabilize mast cells, are safe and effective in alleviating the signs and symptoms associated with AC. [4] Alcaftadine is a multi-action antiallergic agent that functions as an inverse agonist at H1, H2, and H4 histamine receptors and also possesses mast cell-stabilizing and anti-inflammatory properties. Its antihistaminic action helps relieve itching associated with the early phase of ocular allergic reactions, while its ability to stabilize mast cells inhibits the release of pro-inflammatory mediators such as cytokines and lipid-derived substances involved in the late-phase allergic response. These combined mechanisms make alcaftadine an effective therapeutic option for managing AC.[5]

Patients with severe AC often require potent anti-inflammatory treatments, such as topical corticosteroids and immunomodulators. Corticosteroids exert both anti-inflammatory and antiproliferative effects as part of their therapeutic action.[4] They act by inhibiting multiple components of inflammation, including edema, fibrin deposition, capillary dilation, leukocyte migration, capillary and fibroblast proliferation, collagen deposition, and scar formation.[6] Fluorometholone is effective in managing superficial inflammatory conditions of the eye.[7] Loteprednol etabonate (LE) is a corticosteroid that differs structurally from traditional ketone corticosteroids like prednisolone, featuring a chloromethyl ester substitution at the carbon-20 position instead of a ketone group. This unique structural modification is believed to enhance its safety profile, particularly by reducing the risk of intraocular pressure (IOP) elevation.[8]

This study aimed to evaluate the perspectives of current clinical management of AC among ophthalmologists in India, with a focus on disease demographics, preferred pharmacological approaches across different patient populations.

Methods

We carried out a cross-sectional study among ophthalmologists from routine healthcare settings across India from June 2024 to December 2024. The study was conducted after receiving approval from Bangalore Ethics, an Independent Ethics Committee, which was recognized by the Indian Regulatory Authority, the Drug Controller General of India.

A convenient sampling technique was used, and an invitation was sent to leading ophthalmologists in managing AC in the month of March 2024 for participation in this Indian survey. About 212 ophthalmologists from major cities of all Indian states, representing the geographical distribution, shared their willingness to participate and provide necessary data. The questionnaire booklet titled ASTER (Alcaftadine Expert Perspective Study in Allergic Conjunctivitis) was sent to ophthalmologists who were interested in participating in this study. A 23-item questionnaire assessed treatment preferences for AC, including medication choices for various patient groups (adults, children, pregnant women), management strategies for different subtypes (SAC/PAC, VKC, AKC), approaches to refractory cases, and the use of adjunctive therapies. Participants were allowed to skip any questions they did not wish to answer, with unanswered questions considered unattempted. Clinicians were instructed to complete the questionnaire independently without consulting colleagues. Written informed consent was obtained from all participants prior to the study.

Statistical analysis

The data were analyzed using descriptive statistics, with categorical variables expressed as percentages to illustrate their distribution. Each variable's frequency and corresponding percentage were reported to provide a comprehensive overview. To visually represent the distribution of categorical variables, pie and bar charts were generated using Microsoft Excel, version 2409, build 16.0.18025.20030.

Results

The study included 212 participants. Nearly half of the clinicians (46.23%) reported managing more than 25 patients with SAC or PAC per month. The majority (47.17%) indicated that SAC or PAC affects males and females equally. More than half (58.49%) identified the age group 6 to 18 years as the most commonly affected. About 36% observed a higher incidence in urban areas. A substantial proportion (59.91%) noted that SAC or PAC cases are most frequently encountered during the summer months. Approximately 60% of respondents also reported that SAC or PAC is the most frequently encountered form of AC in their practice. Over half of the participants (51.42%) indicated that 5 to 25% of their patients with SAC or PAC also present with systemic allergic conditions. An equal proportion (38.68%) either opted for a comprehensive panel of investigations, including serum IgE, eosinophil count, and skin testing or chose not to rely on any laboratory tests.

Nearly half of the experts (49.53%) indicated that 10–25% of

their patients with SAC or PAC also present with refractive errors. As per 41% of clinicians, compound myopic astigmatism is the most frequently associated refractive error in these patients. Approximately 35% of respondents preferred alcaftadine for treating pediatric AC. Half of the clinicians (50%) expressed a preference for alcaftadine as the antihistamine of choice. The majority of clinicians (36.32%) preferred topical steroids such as fluorometholone or loteprednol for managing AC in adults (Table 2).

A substantial number of clinicians (58.96%) favored topical steroids such as fluorometholone or loteprednol as add-on therapy in cases presenting with severe signs and symptoms of AC (Figure 1). The majority of clinicians (38.21%) indicated alcaftadine as their preferred drug for managing SAC or PAC (Figure 2). Most clinicians (57.08%) selected topical steroids such as fluorometholone or loteprednol as their preferred treatment option for VKC (Table 3).

Half of the clinicians (50%) indicated topical steroids such as fluorometholone or loteprednol as their preferred treatment for AKC (Table 4). According to 43%, loteprednol is their preferred topical steroid in refractory cases of VKC/AKC (Figure 3). Over half of the clinicians (53.77%) favored continuing steroid therapy for more than two weeks in refractory cases of VKC/AKC. More than half of the clinicians (52.83%) preferred prescribing alcaftadine for treating AC in lactating women (Figure 4).

Table 1: Distribution of responses to preferred drug for pediatric AC in routine practice

Preferred medication	(n = 212)
Alcaftadine	34.91%
Olopatadine	27.36%
Bepotastine	8.02%
Topical corticosteroids like fluorometholone/ loteprednol	28.77%
Vasoconstrictors like phenylephrine + naphazoline	0.94%

Table 2: Distribution of responses to preferred drug for AC in adults in routine practice

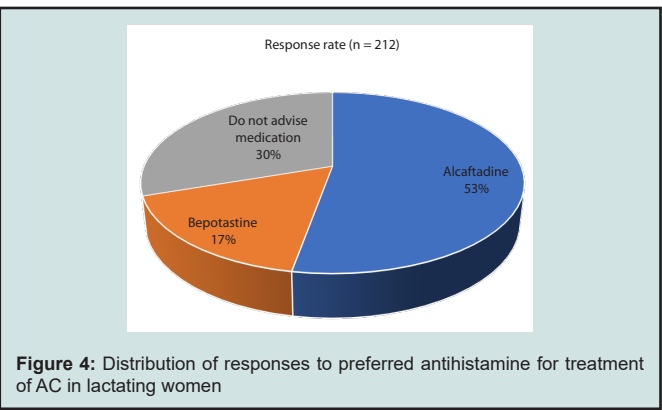
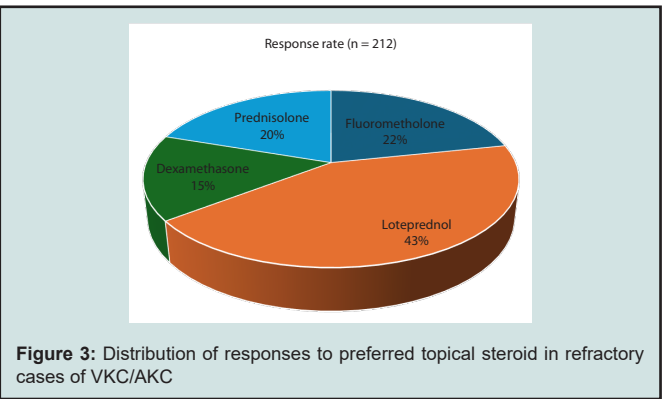
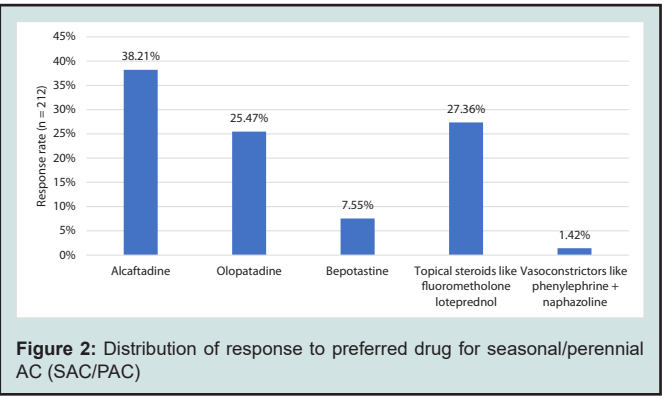
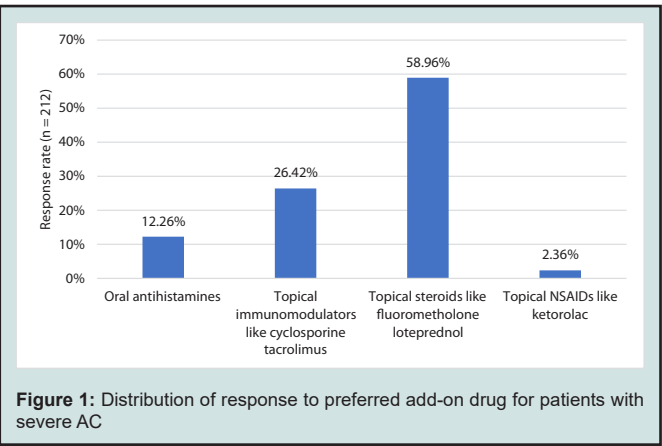
Preferred medication	(n = 212)
Alcaftadine	69 (32.55%)
Olopatadine	48 (22.64%)
Bepotastine	17 (8.02%)
Topical steroids like fluorometholone/loteprednol	77 (36.32%)
Vasoconstrictors like phenylephrine + naphazoline	1 (0.47%)

Table 3: Distribution of responses to the preferred drug for VKC

Preferred medication	(n = 212)
Alcaftadine	19.34%
Olopatadine	18.4%
Bepotastine	4.72%
Topical steroids like fluorometholone, loteprednol	57.08%
Vasoconstrictors like phenylephrine + naphazoline	0.47%

Table 4: Distribution of responses to the preferred drug for AKC

Preferred medication	(n = 212)
Alcaftadine	24.53%
Olopatadine	16.98%
Bepotastine	8.02%
Topical steroids like fluorometholone, loteprednol	50%
Vasoconstrictors like phenylephrine + naphazoline	0.47%



A large proportion of clinicians (75.94%) opted for a combination of adjunctive measures, including artificial tears and cold compresses, in the management of AC. Most of the experts (82.08%) observed that <5% of pregnant women in their practice present with AC. The majority of clinicians (43.40%) reported that they do not prefer using a steroid with an antibiotic combination in the treatment of conjunctival inflammation associated with allergy.

Discussion

The present study results offer a comprehensive overview of real-world practices in the management of allergic conjunctivitis, highlighting clinician preferences for managing various forms of AC across different patient populations. When treating AC in children, clinicians demonstrated a clear preference for alcaftadine, with a majority selecting it as their primary treatment option. This preference extended to the broader category of antihistamine selection, where half of all surveyed clinicians identified alcaftadine as their antihistamine of choice. Furthermore, the majority of clinicians preferred alcaftadine for managing SAC/PAC and in lactating women with AC.

Several studies in the literature support these preferences. A Phase III study by Torkildsen et al. involved 58 healthy volunteers aged 10 and older with a history of AC. Alcaftadine 0.25% demonstrated significant efficacy in reducing ocular itching, conjunctival redness, and other symptoms of AC at both 15 minutes and 16 hours post-administration, with no significant safety concerns reported.[9] A pooled analysis of two multicenter randomized clinical trials by McLaurin et al. supports the use of alcaftadine 0.25% ophthalmic solution for preventing ocular itching associated with AC. Compared to olopatadine 0.2%, alcaftadine 0.25% provided greater relief of itching 16 hours after administration and was significantly more effective than placebo and was generally well tolerated.[10]

Real-world evidence from India also supports these findings. A study conducted in Northern India by Singh et al. reported that alcaftadine 0.25% eye drops provided favorable outcomes with fewer adverse effects. Once-daily administration of alcaftadine 0.25% was more effective in relieving symptoms of AC compared to twice-daily olopatadine 0.1% eye drops.[11] Similar findings were reported by another Indian study by Rajdan et al.[12] Sen et al. found that once-daily alcaftadine 0.25% eye drops demonstrated greater efficacy than once-daily olopatadine 0.2% in relieving the signs and symptoms of AC.[13] Similarly, Gowda et al. reported that alcaftadine 0.25% was more effective than olopatadine hydrochloride 0.1% in reducing the severity of AC.[14]

Greiner et al. demonstrated that treatment with alcaftadine 0.25% ophthalmic solution led to a significant improvement in symptoms, with mean reductions of more than 1 unit in ocular itching and approximately 1 unit in conjunctival redness compared to placebo. [15] A meta-analysis of 12 randomized controlled trials (1,064 patients) found alcaftadine more effective than olopatadine. Although symptom scores were similar on day 3, alcaftadine significantly reduced ocular symptoms by day 7 and 14 and improved conjunctival hyperemia by day 14.) [16]

In adult patients with AC, the treatment approach shifts notably toward topical steroids, with a majority of clinicians preferring

fluorometholone or loteprednol. A randomized controlled trial by Li et al. demonstrated that fluorometholone was effective in managing chronic AC in adults, providing faster symptom relief than pranopfen, particularly in younger patients.[17] Fujishima et al., 0.02% fluorometholone significantly improved both subjective symptoms, such as itching, watering, discharge, and foreign body sensation, and objective signs, including conjunctival injection, edema, papillae, and corneal involvement, after one week of treatment in patients with AC.[18] Ilyas et al. found that loteprednol etabonate 0.2% is a safe topical steroid for long-term use in the treatment of both SAC/PAC.[19] A meta-analysis by Wu et al. involving eight studies found that topical loteprednol significantly improved signs and symptoms of AC compared to placebo. Loteprednol showed efficacy comparable to olopatadine and fluorometholone, with higher improvement rates in clinical signs (RR = 1.53) and symptoms (RR = 1.29).[8]

The preference for topical steroids becomes more pronounced in cases presenting with severe signs and symptoms, where nearly 59% of clinicians in the current survey indicated these as their preferred add-on therapy. For more severe forms, such as VKC and AKC, fluorometholone or loteprednol were favored, with 57% and 50% of clinicians selecting these options, respectively. In refractory cases of VKC/AKC, loteprednol was identified as the preferred topical steroid by the majority of clinicians.

A randomized controlled trial by Chen et al. reported that both fluorometholone alone and in combination with azelastine are effective in relieving the signs and symptoms of severe allergic conjunctival disease.[4] The combination of sodium cromoglycate and fluorometholone eye drops resulted in a 100% therapeutic response in patients with AC. [20] Tahir et al. suggested that fluorometholone may be a more effective treatment option for severe VKC. Among individuals with a baseline severity score of ≥ 6 , fluorometholone achieved an effectiveness rate of 90.7%, compared to 72.1% for cyclosporine.[21] Gupta et al. demonstrated a progressive and statistically significant reduction in symptoms such as itching, watery discharge, and photophobia from day 7 to day 30 with the use of fluorometholone in patients with VKC.[22] Deep et al. demonstrated that loteprednol was more effective than bepotastinebesilate in treating patients with VKC. Loteprednol showed significantly greater improvement in symptoms such as itching, tearing, photophobia, and clinical signs, including upper tarsal papillae, limbal involvement, keratitis, and discharge.[23] Oner et al. reported that loteprednol was effective in the short-term treatment of patients with VKC and was not associated with any side effects during this period.[24]

By highlighting distinct patterns in medication choices, such as the preference for alcaftadine in children and lactating women, and topical steroids like fluorometholone and loteprednol in adults and severe cases, the study provides valuable, practical guidance for ophthalmologists and allergists. The study utilized a carefully designed and validated questionnaire, ensuring that expert opinion was rooted in evidence-based practices. However, several limitations of the study should be acknowledged. As a survey-based investigation, it relies on clinicians' reported preferences rather than objective clinical outcomes or randomized controlled trials. The geographic distribution and areas of specialization of the respondents are not

clearly defined, which may limit the generalizability of the findings. Additionally, the reliance on expert judgment introduces the potential for reporting bias, as individual perspectives and preferences could have influenced the reported conclusions. These limitations should be considered when interpreting the results, and further research is needed to validate and expand upon the findings.

Conclusion

The study highlights distinct patterns in clinician preferences for managing AC, with alcaftadine emerging as the preferred treatment for children, SAC/PAC, and lactating women. For adults and more severe presentations, including VKC and AKC, topical steroids, particularly fluorometholone and loteprednol, were clearly preferred. Loteprednol was specifically favored for refractory cases of VKC and AKC.

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Disclosure of compliance with ethical principles

The study was conducted after receiving approval from Bangalore Ethics, an Independent Ethics Committee, which was recognized by the Indian Regulatory Authority, Drug Controller General of India.

References

1. Baab S, Le PH, Gurnani B, Kinzer EE (2025) Allergic Conjunctivitis. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Apr 18].
2. Miyazaki D, Fukagawa K, Okamoto S, Fukushima A, Uchio E, et al. (2020) Epidemiological aspects of allergic conjunctivitis. *Allergol Int* 69: 487-495.
3. Zhang SY, Li J, Liu R, Lao HY, Fan Z, Jin L, et al. (2021) Association of Allergic Conjunctivitis with Health-Related Quality of Life in Children and Their Parents. *JAMA Ophthalmol.* 139: 830-837.
4. Chen M, Ke B, Zou J, Gong L, Wang Y, Zhang C, et al. (2022) Combination Therapy of 0.1% Fluorometholone and 0.05% Azelastine in Eyes with Severe Allergic Conjunctival Diseases: A Randomized Controlled Trial. *J Clin Med* 11: 3877.
5. Chigbu DI, Coyne AM (2015) Update and clinical utility of alcaftadine ophthalmic solution 0.25% in the treatment of allergic conjunctivitis. *Clin Ophthalmol* 9: 1215-1225.
6. Fung AT, Tran T, Lim LL, Samarawickrama C, Arnold J, Gillies M, et al. (2020) Local delivery of corticosteroids in clinical ophthalmology: A review. *Clin Exp Ophthalmol* 48: 366-401.
7. Minigh J (2025) Fluorometholone. In: Enna SJ, Bylund DB, editors. *xPharm: The Comprehensive Pharmacology Reference* [Internet]. New York: Elsevier; 2007 [cited 2025 Apr 18]. Pp: 1-4.
8. Wu LQ, Chen X, Lou H, Cheng JW, Wei RL (2015) Loteprednol etabonate in the treatment of allergic conjunctivitis: a meta-analysis. *Curr Med Res Opin* 31: 1509-1518.
9. Torkildsen G, Shedden A (2011) The safety and efficacy of alcaftadine 0.25% ophthalmic solution for the prevention of itching associated with allergic conjunctivitis. *Curr Med Res Opin* 27: 623-631.
10. McLaurin EB, Marsico NP, Ackerman SL, Ciolino JB, Williams JM, et al. (2014) Ocular Itch Relief with Alcaftadine 0.25% Versus Olopatadine 0.2% in Allergic Conjunctivitis: Pooled Analysis of Two Multicenter Randomized Clinical Trials. *Adv Ther* 31: 1059-1071.
11. Singh DW, Pandey DML, Rana MK, Chugh DK (2022) Comparative Study Between The Effectiveness And Associated Adverse Effects Of Olopatadine

ISSN: 2334-2838

- And Alcaftadine When Used In Treating Allergic Conjunctivitis In A Tertiary Eye Care Centre Of Northern India. *Journal of Pharmaceutical Negative Results* 31: 3999-4004.
12. Rajdan N, Srivastava B, Titiyal GS, Shujauddin, Kapri S (2025) Comparative study to evaluate efficacy and safety of topical alcaftadine 0.25% versus topical olopatadine 0.2% eye drops in patients with allergic conjunctivitis in a tertiary care teaching hospital, Haldwani. *International Journal of Basic & Clinical Pharmacology* 14: 165-170.
13. Sen S, Yadav HK, Singh P (2020) A Comparative Study of Efficacy of Alcaftadine 0.25 % and Olopatadine 0.2 % in Allergic Conjunctivitis. *J Evid Based Med Healthc* 7: 3153-3158.
14. Gowda MSS, Kumar L K (2021) Comparison of efficacy of topical alcaftadine (0.25%) versus olopatadine (0.1%) in allergic conjunctivitis. *Indian J Clin Exp Ophthalmol* 7: 630-633.
15. Greiner JV, Edwards-Swanson K, Ingerman A (2011) Evaluation of alcaftadine 0.25% ophthalmic solution in acute allergic conjunctivitis at 15 minutes and 16 hours after instillation versus placebo and olopatadine 0.1%. *Clin Ophthalmol* 5: 87-93.
16. Fu X, Xu P, Lu D (2024) Comparative assessment of alcaftadine and olopatadine for allergic conjunctivitis: a meta-analysis. *Postepy Dermatol Alergol* 41: 560-555.
17. Li Z, Mu G, Chen W, Gao L, Jhanji V, Wang L (2013) Comparative evaluation of topical pranopfen and fluorometholone in cases with chronic allergic conjunctivitis. *Cornea*. 32: 579-582.
18. Fujishima H, Tanaka M, Fukagawa K, Okamoto S, Miyazaki D, Yamada J, et al. (2004) Comparison of the efficacy of NSAID (bromfenac sodium) and steroid (fluorometholone) eye drops in the treatment of allergic conjunctivitis. *Investigative Ophthalmology & Visual Science* 45: 4832.
19. Ilyas H, Slonim CB, Braswell GR, Favetta JR, Schulman M (2004) Long-term safety of loteprednol etabonate 0.2% in the treatment of seasonal and perennial allergic conjunctivitis. *Eye Contact Lens* 30: 10-13.
20. Alwadani S (2022) Safety and efficacy of sodium cromoglycate-fluorometholone fixed combination eye drops in allergic conjunctivitis. *Saudi J Ophthalmol* 36: 107-112.
21. Tahir A, Shah SSA, Ashraf MA, Naeem M, Awan LCAH, Iqbal MZ (2023) Treatment Efficacy of Vernal Keratoconjunctivitis with 0.1 Percent Fluorometholone and 0.05 Percent Cyclosporine. *Pakistan Journal of Medical & Health Sciences* 17: 941-941.
22. Gupta SK, Kumar A, Verma A, Agrawal S, Katiyar V (2015) Treatment of vernal keratoconjunctivitis: comparison between topical cyclosporine 0.05% and fluorometholone 0.1% in terms of efficacy and safety. *Indian J Clin Exp Ophthalmol*. 1: 22-28.
23. Deep U, Chander A, Rastogi PS, Ansari M(2020) Comparison of the efficacy and safety of bepotastine besilate 1.5% and loteprednol etabonate 0.5% ophthalmic solution in patients of vernal keratoconjunctivitis. *Indian Journal of Clinical and Experimental Ophthalmology*. 2020;6: 440-444.
24. Oner V, Türkcü FM, Taş M, Alakuş MF, Işcan Y (2012) Topical loteprednol etabonate 0.5 % for treatment of vernal keratoconjunctivitis: efficacy and safety. *Jpn J Ophthalmol*. 2012 Jul;56: 312-328.