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COMPARISON OF IMPROVEMENT IN HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH VERNAL KERATOCONJUNCTIVITIS TREATED WITH BEPOTASTINE BESILATE (1.5%) AND OLOPATADINE HYDROCHLORIDE (0.1%) TOPICAL SOLUTIONS

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ABSTRACT: Vernal keratoconjunctivitis (VKC) is a chronic inflammatory condition affecting the cornea and conjunctiva of young children. Health-related quality of life (HRQoL) is impaired in children with VKC. Mast cell stabilizers are often offered as the first-line therapy for VKC. In this study, the effects of two types of mast stabilizers on HRQoL were compared. This was a prospective, open-label, randomized, and comparative clinical study. Patients were randomized to receive one of two mast cell stabilizers-bepotastine or olopatadine. The HRQoL was assessed using the Quality of Life in Children with Vernal Keratoconjunctivitis (QUICK) questionnaire at baseline and after 3 weeks. The change in the QUICK score was recorded to see the impact of treatment on HRQoL. The mean age of the cohort was 9.6 ± 2 years. Most patients presented in the months of April and May. A statistically significant ($p < 0.1$) change of over 60% in QUICK scores was observed in both groups, but there was no statistically significant difference ($p 0.07$) in the QUICK questionnaire score at 3 weeks between the groups. The bepotastine and olopatadine were comparable in improving HRQoL in patients of VKC patients at 3 weeks.

INTRODUCTION: Health-related quality of life (HRQoL) is the degree of subjective well-being attributable to or associated with a lack of symptoms, psychological state, and activities pursued¹. Physical and mental health have direct and indirect cross-effects between them, and these two together impact the functionality of an individual². Hence, persistent symptoms are expected to affect the psychological state and functionality of an individual.

Vernal keratoconjunctivitis (VKC) is a bilateral, chronic, recurrent, inflammatory disease affecting the ocular surface of young children³. The hallmark symptom of VKC is ocular itching, associated with tearing, discharge, irritation, redness, blepharospasm, and photophobia⁴. Classic immunoglobulin E (IgE)-mediated hypersensitivity and T helper cell type 2 (Th2)-mediated responses are thought to play a major role^{5,6}.

In addition, various inflammatory mediators (e.g., histamine, interleukins) are released along with increased expression of histamine receptors (H1, H2, and H4 receptors) in conjunctival tissue^{7,8}. Several classes of drugs are available in topical form to manage the symptoms of allergic conjunctivitis, including VKC. The first drug for

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VKC is mast cell stabilizers⁹. These drugs effectively control the signs and symptoms of VKC, which show exacerbations during the spring and summer seasons, but only a small percentage of patients have the perennial form¹⁰. The chronic course with seasonal exaggeration of symptoms negatively affects the HRQoL in children with VKC¹¹. The clinical efficacy and safety of different mast cell stabilizers have been compared. However, how treatment with these drugs affects HRQoL is not well studied. In this study, the effects of two types of mast stabilizers on HRQoL were compared.

METHODOLOGY: The prospective, open-label, randomized, and comparative clinical study was conducted in the Department of Pharmacology in collaboration with the outpatient Department of Ophthalmology at a tertiary care teaching hospital. The study protocol was approved by the institutional ethics committee of Maharaja Agarsen Medical College, Agroha (No. MAMC/Pharma/IEC/18/261) and adhered to the Declaration of Helsinki. We invited patients with VKC aged between 5 and 15 years diagnosed with VKC to participate in this study. Informed, written consent was obtained from a legally acceptable representative of the patient, as the age group of study participants was less than 18 years. Based on disease prevalence, the desired sample size was 72 patients, who were randomized into two groups. Patients were randomized (odd and even OPD) to either of the study arms in a 1:1 proportion. Arm-A patients were administered bepotastine besilate ophthalmic solution (1.5% w/v) and arm-B patients were administered olopatadine hydrochloride ophthalmic solution (0.1% w/v) in subjects suffering from VKC.

One drop of either bepotastine besilate ophthalmic solution 1.5% w/v (7 AM and 7 PM) or olopatadine hydrochloride ophthalmic solution 0.1% w/v (7 AM and 7 PM) was administered twice daily to the affected eye in subjects with VKC for 21 days. All the patients received the commercial preparation of study medicines, which are available in hospitals and markets. The same brand and formulations were used throughout the study. A Quality of Life in Children with Vernal Keratoconjunctivitis (QUICK) questionnaire was administered at enrollment to capture the impact of symptoms of

VKC on HRQoL in untreated patients. The Quick Questionnaire is a standardized tool that is used to assess the effect of VKC symptoms on everyday life and daily activities¹². The 16 items of the QUICK questionnaire were allocated into two domains: a) symptoms (12 items) and b) daily activities (4 items). This patient indicated which of the selected items they had experienced directly in the preceding two weeks on a three-point scale (1=never, 2=sometimes, and 3=always). The item and scale scores were ordered, so that higher scores indicated worse HRQoL. The QUICK questionnaire was re-administered at 3 weeks post-treatment to determine the change in HRQoL.

The data was entered in an Excel spreadsheet (Microsoft Co., USA) and analyzed using GraphPadInStat (GraphPad Software Inc., San Diego, California, USA). Descriptive statistics were used to summarize the demographics and clinical data. The values were expressed as the mean (\pm standard deviation) for age and QUICK scores. The statistical significance of the difference between the two groups was computed by applying a two-tailed unpaired "t" test or Mann-Whitney test. The association between categorical variables was studied using the Chi-square test of independence. The level of significance was set at <0.05 .

RESULTS: We recruited 65 patients in two groups (33 in the bepotastine group and 32 in the olopatadine group), of whom 60 completed the study, 30 in each group. The two groups were comparable in terms of age and gender **Table 1**. The demographic and clinical details of the cohort have been published before¹³. In brief, the mean age of the cohort was 9.6 ± 2 years, and 67% of the participants were in the age group of 5 to 10 years. Nearly 56% ($n = 34$) of the patients presented in April and May. A majority ($n = 48$; 80%) belonged to rural areas. The history of atopy was present in 11 (18%) children. The history of VKC in siblings was present in 4 (7%) children.

The baseline QUICK questionnaire score for the bepotastine group was 25.5 ± 0.94 , which reduced to 9.93 ± 1.08 (61%) at 3 weeks. A statistically significant change (<0.01) of 61% was observed. In the olopatadine group, the QUICK questionnaire score was 24.9 ± 0.86 at baseline and 9.46 ± 0.89 at 3

weeks. There was a statistically significant ($p < 0.01$) reduction (62%) in the QUICK questionnaire score at week 3. There was a

statistically significant difference ($p 0.07$) in the QUCIK questionnaire score at 3 weeks between the groups.

TABLE 1: COMPARISON OF DEMOGRAPHICS AND QUCIK SCORE BETWEEN TWO GROUPS

	Bepotastine group (n=30)	Olopatadine group (n=30)	p value
Age (mean \pm SD) in years	8.8 \pm 2.8	9.7 \pm 2.9	0.2
Gender ratio (Boy/Girls)	1.72	3.28	0.3
Atopy history	3	4	0.1
QUICK Score			
-Baseline	25.5 \pm 0.94	24.9 \pm 0.86	0.01
-3 weeks interval	9.93 \pm 1.08	9.46 \pm 0.89	0.07

DISCUSSION: The HRQoL improved with treatment in both groups. The QUICK questionnaire score at 3 weeks decreased by 61% for the bepotastine group and 62% for the olopatadine group, and there was no statistical difference between the two groups. Both treatment arms were comparable regarding the improvement in HRQoL in patients with VKC.

VKC impairs HRQoL by affecting the physical, mental, and social dimensions of health¹⁴. HRQoL is impaired in children with VKC, independent of the ophthalmologic changes and active disease state¹¹. Currently, available topical drugs for allergic conjunctivitis belong to several pharmacologic classes, and mast cell stabilizers are the first-line drugs for VKC⁹. An 8-week comparative study found that bepotastine 1.5% eye drops provided better and faster relief of watering, eye discomfort, and conjunctival hyperplasia, while olopatadine 0.1% eye drops improved papillary hyperplasia more quickly. Both drugs were equally effective in reducing itching¹⁵. However, in our study, we found that improvement in clinical parameters, particularly ocular itching, was superior with bepotastine when compared to olopatadine, though both drugs were well tolerated without any serious adverse effects¹³.

HRQoL measures are used to evaluate different methods of symptom management and the effects of treatments^{16,17}. The QUICK questionnaire is a new, simple instrument to measure HRQoL in children with VKC. Psychometric characteristics make QUICK useful to evaluate the specific burden of VKC on HRQoL¹⁸. Olopatadine 0.2% has been shown to effectively control the symptoms and improve the quality of life in patients with VKC¹⁹. We also found that the improvement in HRQoL of patients was comparable for both drugs. There are a

few limitations of this study worth mentioning. In this study, an improvement in HRQoL was seen at 3 3-week intervals, which is quite short for a chronic disease. However, improvement in HRQoL within in acute phase of the disease shows that exaggeration of symptoms affects the HRQoL and both bepotastine and olopatadine are effective in improving it.

CONCLUSIONS: Both bepotastine (1.5%) and olopatadine (0.1%) improved HRQoL in patients of VKC patients, which was comparable.

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CONFLICTS OF INTEREST: None

REFERENCES:

- Bulpitt CJ: Quality of life as an outcome measure. *Postgrad Med J* 1997; 73: 613-6
- Ohrnberger J, Fichera E and Sutton M: The relationship between physical and mental health: A mediation analysis. *Soc Sci Med* 2017; 195: 42-9.
- Bonini S and Leonardi A.: The multifaceted aspects of ocular allergies: Phenotypes and endotypes. *Ocul Surf* 2022; 26: 174-83
- Radhika R and Pushpa Latha M: Demographic and Clinical Profile of Vernal Keratoconjunctivitis in Teaching Hospital, Kurnool. *Int J Intg Med Sci* 2021; 8: 976-80
- Rodrigues J, Kuruvilla ME, Vanijcharoenkarn K, Patel N, Hom MM and Wallace DV: The spectrum of allergic ocular diseases. *Ann Allergy Asthma Immunol* 2021; 126: 240-54.
- Chigbu DI, Jain P and Khan ZK: Immune Mechanisms, Pathology, and Management of Allergic Ocular Diseases. In: Jain, P., Ndhlovu, L. (eds) *Advanced Concepts in Human Immunology: Prospects for Disease Control* Springer Cham 2020.
- Leonardi A, Fregona IA, Plebani M, Secchi AG and Calder VL: Th1- and Th2-type cytokines in chronic ocular allergy. *Graefes Arch Clin Exp Ophthalmol* 2006; 244: 1240-5
- Leonardi A, Di Stefano A, Vicari C, Motterle L and Brun P.: Histamine H4 receptors in normal conjunctiva and in vernal keratoconjunctivitis. *Allergy* 2011; 66: 1360-6.
- Mehta JS, Chen WL and Cheng ACK: Diagnosis, management, and treatment of vernal keratoconjunctivitis

- in Asia: Recommendations from the management of vernal keratoconjunctivitis in Asia Expert Working Group. *Front Med (Lausanne)* 2022; 9: 882240. Published 2022 Aug 1.
10. Bruschi G, Ghiglioni DG, Cozzi L, Osnaghi S, Viola F and Marchisio P: Vernal Keratoconjunctivitis: A Systematic Review. *Clinic Rev Allerg Immunol* 2023; 65: 277–329.
 11. Artesani MC, Esposito M and Sacchetti M: Health-related quality of life in children at the diagnosis of Vernal Keratoconjunctivitis. *Pediatr Allergy Immunol* 2021; 32: 1271-7
 12. Sacchetti M, Baiardini I and Lambiasi A: Development and testing of the quality of life in children with vernal keratoconjunctivitis questionnaire. *Am J Ophthalmol* 2007; 144: 557-63
 13. Gupta P, Baishnab S and Rewri P: Comparative evaluation of efficacy and safety of bepotastine besilate 1.5% ophthalmic solution versus olopatadine hydrochloride 0.1% ophthalmic solution in patients with vernal keratoconjunctivitis. *International Journal of Basic & Clinical Pharmacology* 2021; 10: 552–60.
 14. Carr AJ, Gibson B and Robinson PG: Measuring quality of life: is quality of life determined by expectations or experience. *BMJ* 2001; 322(7296): 1240-3.
 15. Sruthi V, Reddy RN, Sowmini K and Grace NS: To evaluate the efficacy and safety of olopatadine 0.1% ophthalmic solution and bepotastine 1.5% ophthalmic solution in patients with vernal keratoconjunctivitis in a tertiary care hospital. *Indian J Pharmacol* 2020; 52: 476-81
 16. Coomans MB, Taphoorn MJB and Aaronson NK: Measuring change in health-related quality of life: the impact of different analytical methods on the interpretation of treatment effects in glioma patients. *Neurooncol Pract* 2020; 7: 668-75.
 17. Hernández-Segura N, Marcos-Delgado A, Pinto-Carral A, Fernández-Villa T and Molina AJ: Health-Related Quality of Life (HRQOL) Instruments and Mobility: A Systematic Review. *International Journal of Environmental Research and Public Health* 2022; 19: 16493.
 18. Zhang SY, Li J and Liu R: Association of allergic conjunctivitis with health-related quality of life in children and their parents. *JAMA Ophthalmol* 2021; 139: 830-7.
 19. Scoper SV, Berdy GJ and Lichtenstein SJ: Perception and quality of life associated with the use of olopatadine 0.2% (Pataday) in patients with active allergic conjunctivitis. *Adv Ther* 2007; 24: 1221-32.

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