Original Article

Effects of Drugs in Keratoconjunctivitis

Efficacy of Lodoxamide Versus Sodium Cromoglycate in Vernal Keratoconjunctivitis

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ABSTRACT

Objective: To determine efficacy of lodoxamide as compared to that of sodium cromoglycate when used for the treatment of vernal keratoconjunctivitis.

Study Design: Prospective comparative clinical trial.

Place and Duration of Study: This study was carried out at the Department of Pharmacology and Therapeutics Basic Medical Sciences Institute (BMSI) in collaboration with Department of Ophthalmology Jinnah Postgraduate Medical Center (JPMC) Karachi **f**rom April 2010 to October 2010.

Materials and Methods: A total of untreated 80 cases with clinical diagnosis of vernal keratoconjunctivitis (VKC) of 5-29 years of age and of both sexes were included in this study. Patients of other types of allergic conjunctivitis and of VKC already on medication were not included in this study. Follow up visits were carried out at fortnightly intervals for the period of at least three (03) months to rule out comparative efficacy of the two drugs.

Results: We studied a total of 80 cases, 56 males (70%) and 24 females (30%) with diagnosis of VKC. All cases were divided in two groups; group A and group B. Group A comprised of 40 patients who used lodoxamide whereas; Group B comprised 40 patients who used sodium cromoglycate. No significant difference in demographic features was found in two groups ($p>0.05$). The results showed significant improvement in all symptoms and signs in 60 days of study in group A (lodoxamide) and in group B (sodium cromoglycate) improvement was observed in 90 days of the study ($p<0.05$).

Conclusion: Improvement in all the symptoms and signs was earlier (within 30 days of study) in group A than in group B.

Key Words: Efficacy Lodoxamide, Sodium cromoglycate, VKC.

INTRODUCTION

Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, asymmetrical seasonally exacerbated allergic inflammation of cornea (-kerato) and of bulbar or tarsal conjunctiva (-conjunctivitis). It is more common in children and young adults having atopic history and living in hot climates[1, 2]. Atopic individuals often develop asthma and eczema in childhood[3]. Its incidence in males is twice as compared to females at pre-pubertal age and incidence is equal at puberty[4, 5]. This male preponderance is demonstrated in different studies in Pakistan[6].

The disease is an immunologically mediated type I hypersensitivity reaction to environmental allergens like pollens, animal dander, mites and molds[7]. Clinical types of disease are palpebral, limbal and mixed types. Presenting symptoms are severe itching, photophobia and lacrimation accompanied by ocular discomfort and lacrimation[8, 9]. Signs are ropy mucous discharge, edema of eyelids, chemosis and cobblestone papillae, the hallmark of disease[10]. Diagnosis of disease is based on clinical signs and symptoms. The disease is more prevalent in hot climates like Sub Saharan and Middle East and less common in temperate and almost non-existent in cold climate countries[11]. Severity of disease increases in spring and summer and decreases in fall winter in Mediterranean and other temperate regions[12] while large number of cases reported from subtropical areas like Pakistan[7]. Therapeutic measures are required to alleviate signs and symptoms and to avoid long-standing permanent damage to vision[13]. Lodoxamide and sodium cromoglycate are the two mast cell stabilizer drugs commonly used for treatment of VKC. Both the drugs act by preventing calcium influx in mast cell membrane which prevents its degranulation hence; inflammatory mediators are prevented from being released[14, 15]. Although severe and resistant cases are also treated with topical steroids but these may cause unwanted elevation of intraocular pressure and risk of corneal infections through local immunosuppression[16].

MATERIALS AND METHODS

This prospective study was conducted on eighty (80) patients at Department of Pharmacology and Therapeutics Basic Medical Sciences Institute (BMSI) in collaboration with Department of Ophthalmology Jinnah Postgraduate Medical Center (JPMC) Karachi during April 2010 to October 2010.

Lodoxamide and Sodium cromoglycate were instilled topically four times daily in each eye, in both treatment groups A and B of 40 patients separately. Severity of signs & symptoms was assessed at baseline visit day 0, then evaluation of improvement in all parameters i.e. cobblestone papillae, ropy mucous discharge, photophobia, itching and lacrimation, was carried out at fortnightly follow-up visits at day 15, 30, 45, 60, 75 and 90 with the help of slit-lamp examination.

Statistical Analysis: A comparative trial (Lodoxamide vs. Sodium cromoglycate) was conducted and samples of 80 diagnosed patients (40 from each group) with vernal keratoconjunctivitis were enrolled for this study after taking written consent. Statistical software SPSS version 11.5 was used for data analysis. The results were given in numbers and percentages for qualitative variables and mean and standard deviation for quantitative variable (age). Chi-square test was used for comparison of two treatment groups and p-value of < 0.05 was considered as statistically significant.

RESULTS

The demographic features are shown in **Table.1** which reveals that all patients ranged in ages between 5-29 years of age. Males were 70% (56 patients) and females were 30% (24patients) in both treatment groups. Mean value in group A was14.7 ± 0.96 whereas; in group B it was14.4 ± 0.91. There was no statistically significant difference in gender and age distribution in both treatment groups (p>0.05).

Table No.1: Demographic Features in Two Treatment Groups

	Treatment group	
	Lodoxamide (n=40)	Sod. Cromoglycate (n=40)
Gender		
Male	28 (70%)	28 (70%)
Female	12 (30%)	12 (30%)
Age (years)		
5 – 14	23 (57.5%)	21 (52.5%)
15 – 19	8 (20.0%)	10 (25.0%)
20 – 24	5 (12.5%)	7 (17.5%)
25 – 29	4 (10.0%)	2 (5.0%)
Mean ± SEM	14.7 ± 0.96	14.4 ± 0.91

No significant difference in two treatment groups (p >0.05)

Table No.2: Improvement in different symptoms and signs in two treatment groups from day 0 to day 90

	Lodoxamide (n=40)		Sod. Cromoglycate (n=40)		
	No.	%	No.	%	P-value
Cobblestone papillae					
Day 0	40	100.0	39	97.5	-
Day 15	29	72.5	39	97.5	0.002
Day 30	6	15.0	31	77.5	0.001
Day 60	1	2.5	16	40.0	0.001
Day 90	1	2.5	2	5.0	-
Ropy mucous discharge					
Day 0	30	75.0	32	80.0	0.592
Day 15	11	27.5	29	72.5	0.001
Day 30	1	2.5	18	45.0	0.001
Day 60	-	-	2	5.0	-
Day 90	-	-	-	-	-
Itching					
Day 0	40	100.0	40	100.0	1.000
Day 15	39	97.5	39	97.5	0.812
Day 30	21	52.5	38	95.0	0.001
Day 60	1	2.5	21	52.5	-
Day 90	-	-	3	7.9	-
Photophobia					
Day 0	37	92.5	35	87.5	0.709
Day 15	36	90.0	35	87.5	1.000
Day 30	20	50.0	34	85.0	0.001
Day 60	1	2.5	22	55.0	0.001
Day 90	-	-	2	5.0	-
Lacrimation					
Day 0	40	100.0	38	95.0	0.473
Day 15	28	70.0	36	90.0	0.025
Day 30	8	20.0	30	75.0	0.001

Day 60	1	2.5	18	45.0	0.001
Day 90	-	-	2	5.0	-

Table.2 reveals the improvement along with the comparison of percentage decrease in all symptoms and signs in both treatment groups from day 0 to day 90. A total of eighty (80) patients enrolled in both groups (40 patients in each group). All patients were followed up fortnightly. There was a highly significant improvement in all symptoms and signs in group A (lodoxamide) at day 30 and 60 of the study ($p<0.001$) whereas; improvement in symptoms and signs in group B (sodium cromoglycate) was observed at day 90 of study ($p<0.05$).

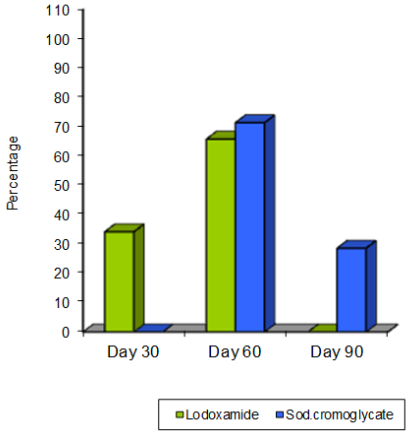

Figure No.1: Comparison of improvement rate in both treatment groups (day-30 to day 90)

Figure 1 reveals that the improvement in symptoms and signs was seen within 30 days of study in 34.2% (13) cases in group A whereas; in group B improvement was not seen. Within 60 days, 65.8% (25) cases were improved in group A and 71.4% (25) cases in group B. Within 90 days remaining of 28.6% (10) cases in group B were improved. The overall improvement rate in group A (Lodoxamide) was 97.4% (38 out of 39 cases) whereas; in group B (Sodium cromoglycate) it was 92.1% (35 out of 38 cases). The improvement was declared when patients became free from symptoms and signs.

Clinically Lodoxamide shown to have faster mode of action on all parameters as compared to Sodium cromoglycate as shown in table 2.

DISCUSSION

The VKC is a common ocular allergy prevailing in our society due to allergens (like pollens, animal dander, industry fumes) and hot weather also adds intensification of the disease. Topical steroids are widely used in controlling the severe distressing symptoms and signs of the VKC e.g. intense itching, photophobia and lacrimation, giant papillary conjunctivitis, corneal shield ulcers and limbitis. But the injudicious and prolonged use of topical steroids carries a high risk of steroid-induced cataract, glaucoma and corneal ulcer with superadded-infections of fungi, viruses and bacteria[17, 18]. Keeping in view all these aspects this study was conducted to evaluate efficacy of two commonly used topical mast cell stabilizers; lodoxamide and sodium cromoglycate. Lodoxamide has been used topically as an ophthalmic solution since late 1990s[19]. The study to assess the safety and efficacy of lodoxamide in vernal keratoconjunctivitis was conducted by the principal author in 2011 and that also revealed very promising effects in improving symptoms and signs of VKC[20]. Sodium cromoglycate also known as 'Cromolyn sodium' was approved by Food and Drug Adminstraion (FDA) America, in 1973[21, 22]. Both the drugs proved to be effective in controlling the early phase inflammation of VKC. But the lodoxamide controlled signs and symptoms of disease i.e. itching, photophobia, lacrimation, ropy mucous discharge and cobblestone papillae, more effectively and earlier than sodium cromoglycate as the results of our study revealed. Bonini et al reported in1997[23] in their study that lodoxamide controlled significantly the ocular itching as compared with placebo. Though the lodoxamide is used in controlling the symptoms and signs of VKC but sodium cromoglycate can also be used for the same purpose and itching is especially controlled within a week after commencement of therapy[24].

CONCLUSION

Our study revealed that between the two mast cell stabilizers used during this study, the lodoxamide is clinically fast effective than Sodium cromoglycate in relieving symptoms and signs of VKC.

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