Open Access

Original Article

Comparison of Efficacy of Warm Compresses Versus Loteprednol-Tobramycin Combination Therapy in the Management of Posterior Blepharitis

Maryam Nisar, Abid Hassan Naqvi*, Nisar Ahmed Khan, Muhammad Shahid Tarar, Nazia Iqbal**

Department of Ophthalmology, Armed Forces Institute of Opthamology/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Department of Ophthalmology, Combined Military Hospital Quetta/National University of Medical Sciences (NUMS) Pakistan, **Department of Community Medicine, Abbottabad International Medical Institute, Abbottabad Pakistan

ABSTRACT

Objectives: to compare the efficacy of warm compresses to add-on therapy with Loteprednol-Tobramycin in patients with posterior Blepharitis.

Study Design: Quasi-experimental study.

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

Methodology: Pre-diagnosed posterior blepharitis patients using warm compresses (Group-A) and add-on antibiotic steroid therapy (Group-B) were included in the study. A detailed history and ophthalmic examination evaluated tear breakup time, tear film height, intra-ocular pressure measurement, meibomian gland function, structure, and meibum appearance. In addition, the patient's symptoms were noted through the ocular surface disease index questionnaire.

Results: The study sample had seventy-one males (56%) and 55 females (43.6%) with mean age of 35.33±12.24 years. The clinical parameters in the two groups were almost alike at enrollment. There was a significant improvement in the clinical parameters in both groups. With slightly better improvement among Group-B (using Loteprednol-Tobramycin), Only two individuals did not report an increase in IOP at six weeks of treatment in Group-B. (p=0.53).

Conclusion: Lid hygiene with warm compresses is an effective alternative with no side effects, provided if appropriately practised; however, add-on therapies may further improve MGD and Blepharitis.

Keywords: Blepharitis, Meibomian gland dysfunction, Warm compresses.

How to Cite This Article: *Nisar M, Naqvi AH, Khan NA, Tarar MS, Iqbal N. Comparison of Efficacy of Warm Compresses Versus Loteprednol-Tobramycin Combination Therapy in the Management of Posterior Blepharitis. Pak Armed Forces Med J 2023; 73(4): 1067-1070.*
DOI: https://doi.org/10.51253/pafmj.v73i4.7695

INTRODUCTION

Posterior Blepharitis is a condition of eyelids which is chronic and presents with pain, discomfort, and inflammation of the lid structures. It may affect all age groups and ethnicities.[1] The eyelid has anterior and posterior lamellae separated by a grey line. The structures posterior to the grey line, such as meibomian glands, orifices, tarsal plates, and blephroconjuctival junction, are affected in posterior Blepharitis.[2] The inflammation may lead to meibomian glands dysfunction, inflammation of the glands (meibomianitis) and irregularity of the lid margins disrupting the tear film, causing dry eye conditions, creating corneal superficial punctate erosions, ulcerations, scarring and permanent vision loss.[3] The permanent disfigurement of the lid margin and watery red eyes leads to low self-esteem.[4]

Posterior Blepharitis and Meibomian gland disease contribute around 60% of the disease burden in Asian countries.[5,6] An estimated 16.4 million individuals in America face dry eye conditions and MGD, with the burden of the disease being 9.3% among adults.[7] However, long-term treatments lead to complications.[8] Long-term steroids lead to raised intraocular pressures, and antibiotic treatment results in resistance; some immunomodulatory drugs cause irritation and discomfort.[9] Hence, more natural therapies like warm compresses shall be used.[10]

Blepharitis requires long-term treatment and is often exasperating for both patient and physician. Thus more natural therapies shall be considered trustworthy to overcome the risks of complications. Hence, the rationale of the study was to discover the efficacy of methods that may lead to lesser complication rates with long-term treatment. Therefore, the study aimed to compare the effectiveness of warm compresses to add-on therapy with Loteprednol-Tobramycin in patients with posterior Blepharitis.

METHODOLOGY

The quasi-experimental study was conducted from June 2020 to July 2021 at the Armed forces institute of Ophthalmology, Rawalpindi. The Institutional Ethics and Review Board approved the study

Correspondence: Dr Maryam Nisar, Department of Ophthalmology, Armed Forces Institute of Opthamology Pakistan
Received: 29 Nov 2021; revision received: 15 Jan 2022; accepted: 21 Jan 2022

(Reference Number: 203/ERC/AFIO). Written and informed consent was taken from the patients. The WHO sample size calculator was used to assess the sample size, using an effect size of 0.5, standard deviation of 1, and 10% attrition rate.[10]

Inclusion Criteria: Patients of either gender with prediagnosed posterior Blepharitis aged more than 18 years, with prescribed warm compresses (once per day) and add-on antibiotic steroid therapy, were included. One eye per patient was considered for computing the data. The eye with more severe disease was chosen for patients with both eyes, or the right eye was considered for data collection and inclusion in the study.

Exclusion Criteria: Patients with lid structure abnormalities, ocular surface disruption, surgery, a history of drug allergy, and patient on treatment for more than two weeks were excluded.

Patients prescribed warm compresses with lid hygiene and lubricants were categorized in Group-A. Patients prescribed Loteprednol (0.5% w/v)-Tobramycin (0.3% w/v) eye drops with lid hygiene were considered Group-B.

A detailed history and ophthalmic examination were conducted. Tear break-up time (above 10 seconds was considered normal), tear film height (average above 0.2 mm), and intraocular pressure measurement were conducted through slit lamp examination and Goldman Applanation tonometer, respectively, at the time of enrollment. In addition, meibomian gland function, structure and meibum appearance were evaluated. The patient's symptoms were noted through the ocular surface disease index proformas having set questions and meibomian gland expressibility grading based on the scoring proformas.[11,12] Meibum expressibility was graded as all glands expressible (score zero), 3-4 glands showing meibum (score one), 1-2 glands showing meibum (score two), and MG blockage (score three). Meibum Quality scoring was done based on consistency as clear (score-0), cloudy (score-1), particulate (score-2), and toothpaste-like (score-3). (Ocular surface disease index) OSDI scoring was done based on the scores from the questions as mild (score=13-22), moderate (score=22-32), and severe (score=33-100).[13] Patients were followed up after six weeks, and the abovementioned assessment was repeated.

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Quantitative variables were expressed as mean±SD and qualitative variables were expressed as frequency and percentages. Independent sample t-test was applied to explore the inferential statistics. The *p*-value of 0.05 or less was taken as significant.

RESULTS

The study sample (n=126) was divided into two groups. Group-A (n=63) patients were prescribed warm compresses with lubricants and lid hygiene, and Group-B (n=63) had prescribed Loteprednol-Tobramycin eye drops three times a day and lid hygiene instructions.

The clinical parameters of two groups were almost identical at enrolment (Table-I). The mean ocular surface disease index for both groups was in the moderate disease range with cloudy to particulate meibum expressible from 1-2 glands on the examination eye. There was a significant improvement in the clinical parameters in both groups (Table-II). The tear breakup time increased with a decrease in OSDI and Meibum expressibility scores. No significant change was observed in intraocular pressures in Group-B in comparison to Group-A.

Table–I: Ocular Clinical Parameters at the time of Enrollment (n=126)

	Group-A (n=63)	Group -B (n=63)	*p*-value
Ocular Parameters	**Mean±SD**	**Mean±SD**	
Tear break up time (sec)	6.09±3.20	6.65±2.62	0.627
Ocular dry eye index	32.70±9.78	30.97±9.04	0.305
Intraocular pressure (mmHg)	12.25±1.83	12.25±1.82	1.000
Meibum expressibility score	2.11±0.785	2.02±0.72	0.095
Meibum Quality score	1.84±1.03	1.78±0.88	0.712
Tear Meniscus height (mm)	0.2±0.05	0.2±0.03	0.041

Table-II: Ocular Clinical Parameters 6 weeks after Treatment (n=126)

	Group-A (n=63)	Group 2-B (n=63)	*p*-value
Ocular Parameters	**Mean±SD**	**Mean±SD**	
Tear break up time (sec)	8.71±2.38	9.51±1.81	0.038
Ocular dry eye index	28.59±10.10	25.33±8.51	0.053
Intraocular pressure (mmHg)	11.95±1.71	12.21±2.74	0.535
Meibum expressibility score	1.90±0.777	1.60±0.661	0.021
Meibum Quality score	1.62±1.08	1.56±0.94	0.720
Tear Meniscus height (mm)	0.2±0.05	0.2±0.03	0.040

There was a slightly better improvement in Group-B at six weeks follow-up than in Group-A. The mean tear breakup time was better in Group-B than in Group-A (p=0.03). The mean OSDI score remained in the moderate eye disease category. However, it was noted to be slightly better in Group-B compared to Group-A (*p*=0.05). The meibum quality score improved

cloudiness in Group-A and Group-B (p=0.727). Meibum gland expressibility improved almost equally to 3-4 glands expressible after treatment in Group-A and Group-B (p=0.021). The complication rate needed to be adequately significant among the two groups. No individuals reported any complications in the Group practising lid hygiene with lubricants and compresses. However, two individuals had raised IOP in Group-B.

DISCUSSION

Our results showed that warm compresses with lid hygiene could improve the Meibomian gland dysfunction almost equally compared to supporting antibiotic and steroid treatment. However, adding steroids and antibiotics to warm compresses may benefit the treatment slightly better than warm compresses alone. The long-term addition of medications has its complications. Hence knowledge about the efficacy of natural methods becomes eminent for managing such diseases.

Research study by Lee *et al*.[13] showed that (tear break-up time) TBUT, meibum quality and expression, eyelid margin irregularity, and OSDI showed significant improvement (p=<0.001). These results were achieved after employing regular eyelid hygiene with scrubbing and manual meibomian gland squeezing without medication. The management of Blepharitis with warm compresses and lid hygiene was also supported by another study.[14] showing that the TBUT, eyelid margin irregularities, meibum quality, and ocular surface index showed significant improvement (p<0.001). However, they highlighted that adding an intervention to the conventional treatment could improve the outcomes. This is because warm compresses help remove the meibum, decreasing the content for infections to flourish and improving the meibomian gland dysfunction.[15] Another study by Eom *et al*. on cataract surgery patients documented cataract surgery as a risk factor for MGD and Blepharitis.[16] Their results revealed that the MGD worsened with Blepharitis in patients advised not to follow lid hygiene and warm compresses pre-and post-operatively, despite antibiotics and steroids. Furthermore, the research concluded a significantly decreased number of individuals facing Blepharitis and MGD who practised lid hygiene protocols pre-and post-operatively per the doctors' instructions.

Our results showed that the clinical parameters significantly improved in both groups, with slightly better efficacy with antibiotics and steroids. The reason is that Loteprednol effectively decreases inflammatory cytokines in dry eye conditions.[17] The cytokines which trigger the inflammation in meibomian gland dysfunction tend to lower with Loteprednol use. The chief fear of steroid treatment is increased intraocular pressure for steroid responders and long-term therapies. Loteprednol-Tobramycin is a combination of equal efficacy with fewer risks of complications due to Loteprednol having little effect on intraocular pressure. Hence complication rates such as raised intraocular pressure or irritability are less with Loteprednol antibiotic combinations than with the Tobramycin-dexamethasone combination.[18,19] This was supported by our results, where the intraocular pressure was not raised in the Group using Loteprednol treatment.

Our results showed that if practised adequately, warm compresses alone may significantly improve MGD and OSDI. Furthermore, the improvements in clinical parameters reflect almost equal efficacy compared to add-on therapies with steroids and antibiotics. The steroids and antibiotics may facilitate further by controlling the inflammation and infectious processes in the eyes having gland dysfunction.

CONCLUSION

Blepharitis is a condition of eyelids known for its chronicity and inflammatory element that may lead to infection, permanent eyelid structure change, and corneal disruption if unattended. Therefore, topical antibiotics, steroids, and other medications recommended as first-line therapy must be used with precaution for longer treatments to avoid complications. Hence, our results concluded that warm compresses with lid hygiene are an effective alternative with no side effects, provided if appropriately practised.

Conflict of Interest: None.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

MN: & AHN: Conception, study design, drafting the manuscript, approval of the final version to be published.

NAK: & MST: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

NI: Critical review, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. AlDarrab A, Alrajeh M, Alsuhaibani AH. Meibography for eyes with posterior blepharitis. Saudi J Ophthalmol 2017; 31(3): 131-134. https://doi.org/10.1016%2Fj.sjopt.2017.05.014

2. Suzuki T. Inflamed Obstructive Meibomian Gland Dysfunction Causes Ocular Surface Inflammation. Investig Ophthalmol Visual Sci 2018; 59(14): DES94-DES101. https://doi.org/10.1167/iovs.17-23345
3. Suwal A, Hao JL, Zhou DD, Liu XF, Suwal R, Lu CW, et al. Use of Intense Pulsed Light to Mitigate Meibomian Gland Dysfunction for Dry Eye Disease. Int J Med Sci 2020; 17(10): 1385-1392.https://doi.org/10.7150%2Fijms.44288
4. Meduri A, Frisina R, Rechichi M, Oliverio GW. Prevalence of Meibomian Gland Dysfunction and Its Effect on Quality of Life and Ocular Discomfort in Patients with Prosthetic Eyes. Prosthesis 2020; 2(2): 91-99. https://doi.org/10.3390/prosth2020
5. Mostovoy D, Vinker S, Mimouni M, Goldich Y, Levartovsky S, Kaiserman I, et al. The association of keratoconus with blepharitis. Clin Exp Optom 2018; 101(3): 339-344. https://doi.org/10.1111/cxo.12643
6. Irfan S. Meibomian Gland Dysfunction. Pak J Ophthalmol 2019; 35(1): 63-72.
7. O'Neil EC, Henderson M, Massaro-Giordano M, Bunya VY. Advances in dry eye disease treatment. Curr Opin Ophthalmol 2019; 30(3): 166-178. https://doi.org/10.1097/icu.000000000569
8. Lam PY, Shih KC, Fong PY, Chan TCY, Ng AL, Jhanji V, et al. A Review on Evidence-Based Treatments for Meibomian Gland Dysfunction. Eye Contact Lens 2020; 46(1): 3-16. https://doi.org/10.1097/icl.0000000000000680
9. Viswambaran VK, Chandrababu G, Babu A, Rajeev G, Gupta S. Blepharitis: A Review on Human Clinical Trials with Synthetic and Natural Remedies. Biomed Pharmacol J 2020; 13(4): 1939-1945. https://dx.doi.org//10.13005/bpj/2072
10. Murphy O, O' Dwyer V, Lloyd-Mckernan A. The Efficacy of Warm Compresses in the Treatment of Meibomian Gland Dysfunction and Demodex Folliculorum Blepharitis. Curr Eye Res 2020; 45(5): 563-575. https://doi.org/10.1080/02713683.2019.186153
11. Wolffsohn JS, Arita R, Chalmers R, Djalilian A, Dogru M, Dumbleton K, et al. TFOS DEWS II Diagnostic Methodology report. Ocular Surf 2017; 15(3): 539-574. https://doi.org/10.1016/j.jtos.2017.05.001
12. Xiao J, Adil MY, Chen X, Utheim ØA, Ræder S, Tønseth KA, et al. Functional and Morphological Evaluation of Meibomian Glands in the Assessment of Meibomian Gland Dysfunction Subtype and Severity. Am J Ophthalmol 2020; 209(1): 160-167. https://doi.org/10.1016/j.ajo.2019.09.005
13. Lee H, Kim M, Park SY, Kim EK, Seo KY, Kim TI, et al. Mechanical meibomian gland squeezing combined with eyelid scrubs and warm compresses for the treatment of meibomian gland dysfunction. Clin Exp Optom 2017; 100(6): 598-602. https://doi.org/10.1111/cxo.12532
14. Albietz JM, Schmid KL. Randomised controlled trial of topical antibacterial Manuka (Leptospermum species) honey for evaporative dry eye due to meibomian gland dysfunction. Clin Exp Optom 2017; 100(6): 603-615. https://doi.org/ 10.1111/cxo.12524.
15. Leal SM Jr, Rodino KG, Fowler WC, Gilligan PH. Practical Guidance for Clinical Microbiology Laboratories: Diagnosis of Ocular Infections. Clin Microbiol Rev 2021; 34(3): e0007019. https://doi.org/ 10.1128/CMR.00070-19.
16. Eom Y, Na KS, Hwang HS, Cho KJ, Chung TY, Jun RM, et al. Clinical efficacy of eyelid hygiene in blepharitis and meibomian gland dysfunction after cataract surgery: a randomized controlled pilot trial. Sci Rep 2020; 10(1): 11796. https://doi.org/10.1038/s41598-020-67888
17. Ko JS, Seo Y, Chae MK, Jang SY, Yoon JS. Effect of topical loteprednol etabonate with lid hygiene on tear cytokines and meibomian gland dysfunction in prosthetic eye wearers. Eye 2018 ; 32(2): 439-445. https://doi.org/10.1038/eye.2017.213
18. Comstock TL, DeCory HH. Loteprednol Etabonate 0.5%/ Tobramycin 0.3% Compared with Dexamethasone 0.1%/ Tobramycin 0.3% for the Treatment of Blepharitis. Ocul Immunol Inflam 2017; 25(2): 267-274. https://doi.org/10.3109/09273948.2015.1115879
19. Beckman K, Katz J, Majmudar P, Rostov A. Loteprednol Etabonate for the Treatment of Dry Eye Disease. J Ocul Pharmacol Therapeut 2020; 36(7): 497-511. https://doi.org/10.1089/jop.2020.0014