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Original article

IOP-lowering efficacy and tolerability of preservative-free tafluprost 0.0015% among patients with ocular hypertension or glaucoma

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Abstract

Objective:
Tafluprost, the first preservative-free prostaglandin analogue for topical ophthalmic use to lower IOP, was introduced in Germany in 2008. After the approval for ophthalmic use, an open-label, multicentre, observational study was conducted between October 2008 and April 2009. Major objectives of this study were to evaluate the real world efficacy, local tolerability and safety of this first in class preservative-free prostaglandin preparation in patients with ocular hypertension and glaucoma.

Methods:
A total of 544 patients were treated with the preservative-free formulation of tafluprost 0.0015%. The majority of these patients had poor IOP control and/or poor local tolerance of their medication prior change of medication. The decision to change the previous therapy or to initiate treatment was made solely by the participating ophthalmologists. IOP readings were recorded at baseline before changing medication or initiating treatment in newly diagnosed patients, 4–6 weeks and 12 weeks after change of medication or initiation of treatment with preservative-free tafluprost. In addition, patient demographics, subjective symptoms (i.e. burning, foreign body sensation, itching and stinging) and objective clinical signs such as conjunctival hyperaemia were collected. Subjective symptoms were evaluated using a 4 point scale ranging from 'no symptoms', 'mild symptoms', 'moderate symptoms' to 'severe symptoms'. As a clinical sign severity of conjunctival hyperaemia was evaluated. All adverse events were collected.

Results:
Three hundred and sixty patients were switched from monotherapy, 45 patients were naïve to treatment. A total of 139 patients were treated with fixed or non-fixed combinations prior to changing medication. In these patients preservative-free tafluprost was used either as a substitution for the fixed or non-fixed combination, as an add-on to the existing combination therapy or as one agent in a newly initiated treatment regimen. Preservative-free tafluprost provided an IOP decrease in most pre-treatment subgroups, with an overall reduction of IOP in all patients ($N = 544$) from 19.4 ± 5.0 mmHg at baseline to 15.7 ± 4.1 mmHg after 4 to 6 weeks and to 15.3 ± 3.5 mmHg after 12 weeks. Both values were significantly lower than treated baseline IOP ($p < 0.001$). An IOP of ≤ 18 mmHg was achieved in 79.5% of eyes treated with the preservative-free formulation of tafluprost 12 weeks after changing medication. Both subjective symptoms and objective clinical signs improved after changing medication. Only a few adverse events occurred during the follow-up period.

Conclusions:
Although this study was limited by its observational design, the results demonstrate that preservative-free tafluprost is an effective, well tolerated, and safe medication in a patient population with poor IOP control and/or tolerability issues with their medication prior used.

Introduction

Glaucoma is the second leading cause of blindness worldwide. Increased intraocular pressure (IOP) is considered to be the most important risk factor and the only one that can be modified. Major outcome studies published in recent years have shown that lowering IOP is beneficial for patients with primary open-angle glaucoma and ocular hypertension[1–4]. Worldwide, prostaglandins have become the major therapeutic class for medical treatment of glaucoma because of their excellent efficacy and favourable safety profile[5]. Tafluprost is a novel prostaglandin that has been approved for ophthalmic use in a number of markets worldwide. It is currently marketed under the following brand names: Taflotan* and Taflotan sine* by Santen Oy, Tampere, Finland, Tapros† by Santen Pharmaceutical Co. Ltd in Japan and as Saflutan‡ by Merck Sharp & Dohme Corp. Tafluprost, an efficacious prostaglandin which is highly selective for the prostaglandin FP-receptor[6,7] lowered IOP effectively and was well tolerated in clinical studies[8–10].

Preservative-free tafluprost 0.0015% is the first and only preservative-free prostaglandin that is available for the treatment of patients with glaucoma and ocular hypertension. In a cross-over study, it was demonstrated that the preservative benzalkonium chloride (BAK) has no effect on the efficacy of tafluprost. Both a BAK preserved and a preservative-free formulation of tafluprost were equivalent in lowering IOP[10]. Furthermore, several separate studies clearly demonstrate the toxic effects of preservatives such as BAK. Animal studies have shown that inflammatory markers and cells (i.e. polymorphs, neutrophils and lymphocytes) increase in conjunctival tissues after application of ophthalmic solutions containing BAK. A complete loss of conjunctival goblet cells was also reported in these studies[11,12]. Other clinical studies demonstrate major differences with respect to subjective symptoms, local tolerability and objective clinical signs after the use of preserved and preservative-free glaucoma medications[13–17].

This observational study was conducted between October 2008 and April 2009 in Germany. The purpose of the study was to evaluate the efficacy, local tolerability and safety of preservative-free tafluprost in a heterogeneous patient population in a real world setting.

Patients and methods

In this open-label, multicentre study, patients previously diagnosed with glaucoma or ocular hypertension who required a change of medication, an add-on therapy or who were naïve to medical treatment were followed for 12 weeks after changing medication to or initiation of medical therapy with the preservative-free formulation of tafluprost 0.0015% once daily. In this observational, non-interventional study design, the study treatment was based on the decision of the physician only regardless of study participation and treatment use. German law does not require informed consent for this type of non-interventional observational studies. Using an internet based standardized data collection format, participating ophthalmologists provided anonymous patient data for patients who required initiation or a switch of an IOP-lowering therapy to achieve IOP control. The switch or initiation of medication was done at the physician's discretion, and their reasons for recommending the new medication were collected. Demographics, information about prior treatments and IOP readings were recorded. The presence of subjective symptoms and clinical signs was recorded by the physician using a 4-point scale (none, mild, moderate, severe) at the initial visit. In a subpopulation of patients, tear-film break-up time (TBUT) and amount of tear fluid (Schirmer test) were measured. Satisfaction of patients and physicians was measured using a 4-point scale (very satisfied, satisfied, less satisfied, not satisfied at all). Symptoms at final visit (week 12) were compared to baseline by the patient, clinical signs by the physician using a 3 step scale (better, same, worse). IOP measurements were made using Goldman applanation tonometry for each eye at baseline (run-in on prior treatment or start of medical therapy), 4 to 6 weeks and 12 weeks after changing or initiation of treatment with preservative-free tafluprost 0.0015%. Paired *t*-tests were conducted to compare IOP values at baseline to IOP values after treatment with tafluprost 0.0015%. All adverse events were recorded by the physicians.

Results

Patient population

Reports of 544 patients (1088 eyes) were included in the evaluation (Table 1). A majority of the patients ($N = 339$; 62.3%) were female. Primary open angle glaucoma (POAG) was the most common diagnosis ($N = 833$ eyes; 76.6%) followed by ocular hypertension (OH) ($N = 119$ eyes; 10.9%), normal tension glaucoma (NTG) ($N = 67$ eyes; 6.2%), pseudo exfoliation glaucoma (PEX) ($N = 33$ eyes; 3.0%) and 'other glaucomas' ($N = 36$ eyes; 3.3%). Prior medication was changed in 330 patients due to efficacy reasons (60.7%). However, subjective symptoms and clinical signs were other important reasons for changing therapy to or adding preservative-free tafluprost to an

*Taflotan and Taflotan sine are registered trade names of Santen Oy, Tampere, Finland.

†Tapros is a registered tradename of Santen Pharmaceutical Co. Ltd, Osaka, Japan.

‡Saflutan is a registered trade name of Merck Sharp & Dohme Corp.

Table 1. Patient demographics. Characteristics of the patient population included in the observational study with preservative-free tafluprost 0.0015%.

Patients (*N*)		544
Mean age [Range]		65.5 [15–100]
Gender	*n*	%
Male	205	37.7
Female	339	62.3
Diagnoses (number of eyes)		
Ocular hypertension	119	10.9
Primary open angle glaucoma	833	76.6
Normal tension glaucoma	67	6.2
Pseudo exfoliation glaucoma	33	3.0
Other glaucomas	36	3.3
Glaucoma duration (years)	Mean	Range
	6.5	<1–35

Table 2. Reasons for changing therapy to preservative-free tafluprost 0.0015%, adding preservative-free tafluprost 0.0015% to an existing medical treatment regimen or initiating therapy with preservative-free tafluprost 0.0015%.

Reason for changing medication	*N*	%
Efficacy	330	60.7
Lowering of IOP not sufficient or target pressure not achieved	296	54.4
Tachyphylaxis to medication prior change	19	3.5
Progression of glaucomatous defects	15	2.8
Ocular symptoms and clinical signs	167	30.7
Ocular symptoms (irritation, burning, stinging . . .)	94	17.3
Objective clinical signs (hyperaemia, tearing, blepharitis . . .)	73	13.4
Adverse events/contraindication(s)	27	5.0
Systemic intolerability	15	2.8
Contraindication(s) vs. prior therapy	12	2.2
Others	20	3.7
Total	544	100.0

existing medication ($N = 167$ patients; 30.7%) (Table 2, Figure 1).

Prior therapy

Prior to switching to preservative-free tafluprost, patients used a variety of other medications (Tables 3 and 4). Most patients had been on monotherapy ($N = 360$; 66.2%); ß-blockers ($N = 129$) and prostaglandin analogues (PGA) ($N = 124$) were the most common monotherapies with 23.7% and 22.8% of patients, respectively. One hundred and thirty-nine patients (25.6%) used a fixed or non-fixed combination prior to change of medication (Tables 4 and 5).

Effect on IOP

Overall mean IOP (±SD) was 19.4 ± 5.0 mmHg at treated baseline. Four to 6 weeks after changing medication, overall mean IOP was reduced to 15.7 ± 4.1 mmHg, and after 12 weeks to 15.3 ± 3.5 mmHg (Figure 2). At both 4 to 6 weeks and 12 weeks, overall treated IOP values were significantly lower than baseline values ($p < 0.001$). The IOP reduction is equivalent to 19.1% and 21.1% from treated baseline, respectively (Figure 2).

In all monotherapy pre-treatment subgroups preservative-free tafluprost 0.0015% lowered IOP significantly versus mean treated baseline IOP at both 4 to 6 weeks and 12 weeks (Figure 3, Table 6). This includes patients who were switched from a ß-blocker monotherapy, a PGA monotherapy or a monotherapy with a carbonic anhydrase inhibitor (CAI) to a monotherapy with preservative-free tafluprost. Patients who had been using ß-blocker monotherapy prior to switch achieved a 25.6% reduction from treated baseline at week 12 (Figure 3, Table 6). Former CAI monotherapy users achieved a 21.9% reduction and patients who had been using a PGA monotherapy prior to switch achieved an 8.7% reduction in IOP at week 12. All changes were significant ($p < 0.001$) vs. treated baseline. In patients naïve to medical treatment IOP was reduced from an average of 22.1 ± 4.0 mmHg at baseline to 15.0 ± 2.9 mmHg at week 12 (Figure 3). This IOP reduction is equivalent to a 32.1% drop in IOP. Among all patients who finished the 3 month follow-up period ($N = 497$) 658 eyes (66.2%) had a lower IOP compared to their prior therapy, 117 eyes (11.8%) stayed the same, and 219 eyes (22.0%) were at a higher IOP level. In all patients preservative-free tafluprost 0.0015% provided IOP of less ≤18 mmHg for 79.5%, ≤16 mmHg for 63.8% and ≤14 mmHg for 47.3% of all eyes. In a subgroup of patients who were switched to preservative-free tafluprost due to efficacy reasons with prior monotherapy treatment regimen IOP was lowered significantly ($p < 0.001$). In the subgroups switched due to tolerability reasons (ocular signs and subjective symptoms) from prior monotherapy a much smaller effect on IOP reduction was achieved (Table 6).

Subjective signs and clinical symptoms

Physicians and patients both rated tolerability of treatment with preservative-free tafluprost at the final visit. Sixty-nine point two of physicians and 94.8% of patients indicated they were either 'very satisfied' or 'satisfied' with the tolerability of preservative-free tafluprost. All subjective symptoms improved by the final examination (12 weeks after change of medication) compared to the baseline (Figure 1 and Figure 4). Clinical signs had also improved by the final examination (12 weeks after changing medical treatment). The frequency and severity of hyperaemia was reduced over the 3 month treatment period. The percentage of patients without any signs of hyperaemia increased from 55.7% ($N = 303$) at baseline prior to changing

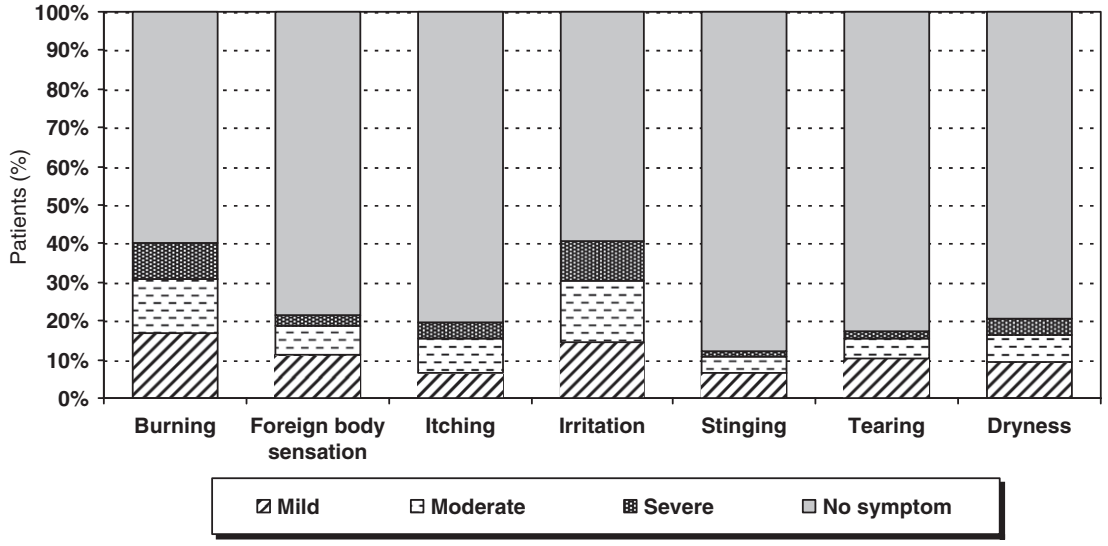

Figure 1. Frequency and severity of ocular symptoms at baseline prior to change of medication.

Table 3. Prior therapy used before initiating, switching or adding preservative-free tafluprost 0.0015%.

Type of pre-treatment	*N*	%
Naïve patients	45	8.3
Monotherapy	360	66.2
ß-blockers	129	23.7
Prostaglandin analogues	124	22.8
Alpha-2 agonists	37	6.8
Carbonic anhydrase inhibitors	69	12.7
Miotics	1	0.2
Combination therapy	139	25.6
Fixed combinations	60	11.0
Non-fixed combinations (2 agents)	32	5.9
Non-fixed combinations (≥3 agents)	47	8.6
Total	544	100.0

Table 4. Medical treatment with fixed and non-fixed combinations at baseline prior to change of medication.

	N	%
Fixed combinations	60	11.0
CBFC	32	5.9
ABFC	13	2.4
PBFC	13	2.4
MBFC	2	0.4
Non-fixed combinations – 2 drugs	32	5.9
C + P	9	1.7
A + P	7	1.3
A + B	4	0.7
A + C	3	0.6
B + P	3	0.6
B + C	3	0.6
B + M	2	0.4
A + M	1	0.2
Fixed combinations plus additional drug	34	6.3
CBFC + P	15	2.8
PBFC + C	6	1.1
CBFC + A	4	0.7
PBFC + A	4	0.7
ABFC + P	2	0.4
ABFC + C	1	0.2
MBFC + C	1	0.2
PBFC + B	1	0.2
Non-fixed combination – 3 drugs	4	0.7
A + C + P	4	0.7
Combination of 2 fixed combinations	1	0.2
CBFC + PBFC	1	0.2
Combination of fixed combination plus 2 additional drugs	8	1.5
CBFC + A + P	3	0.6
CBFC + C + P	1	0.2
CBFC + A + M	1	0.2
ABFC + A + P	1	0.2
ABFC + C + P	1	0.2
PBFC + A + C	1	0.2

Fixed combinations – CBFC: carbonic anhydrase inhibitor + beta blocker; ABFC: alpha-2 agonist + beta blocker; PBFC: prostaglandin analogue + beta blocker; MBFC: miotic + beta blocker. Single agents – A: alpha-2 agonist; B: beta blocker; C: carbonic anhydrase inhibitor; M: miotic; P: prostaglandin analogue.

medication to 88.2% ($N = 480$). In a subgroup of patients who had been using PGA monotherapy, the number of patients without any hyperaemia increased from 35.5% ($N = 44$) at baseline to 86.3% ($N = 107$). In addition, no severe hyperaemia occurred in this subgroup of patients 12 weeks after changing medication to preservative-free tafluprost (Figure 5).

In small subgroups of patients TBUT ($N = 32$) and Schirmer test ($N = 37$) were measured at baseline and 12 weeks after changing medication to or initiating therapy with preservative-free tafluprost. Both parameters improved significantly after 12 weeks compared to baseline: TBUT increased from an average of 9.4 ± 3.5 s at baseline to 11.8 ± 3.1 s at week 12 and tear production as measured by Schirmer from 12.7 ± 5.3 mmHg to 14.9 ± 5.5 mmHg. Both changes were statistically significant versus baseline ($p < 0.005$).

Table 5. Prior therapy with fixed and non-fixed combinations. Details of change of medical treatment including preservative-free tafluprost.

	N	%
Total pre-treatment fixed combinations	60	11.0
Switched from fixed combination to †PF tafluprost monotherapy	43	7.9
†PF tafluprost added to fixed combination	13	2.4
Change of medical treatment from fixed combinations	4	0.7
Total pre-treatment non-fixed combinations	79	14.5
Pre-treatment non-fixed combinations 2 agents	33	6.1
Switched to †PF tafluprost monotherapy	16	2.9
†PF tafluprost added to non-fixed combinations	1	0.2
Substitution of single drug/product of combination therapy by †PF tafluprost	9	1.7
Change of medical treatment from non-fixed combinations	7	1.3
Total pre-treatment non-fixed combinations ≥3 agents	46	8.5
Switched from non fixed-combination to †PF tafluprost monotherapy	10	1.8
†PF tafluprost added to non-fixed combinations	3	0.6
Substitution of single drug/product of combination therapy by †PF tafluprost	16	2.9
Change of medical treatment from non-fixed combinations	17	3.1

†PF tafluprost: preservative-free tafluprost.

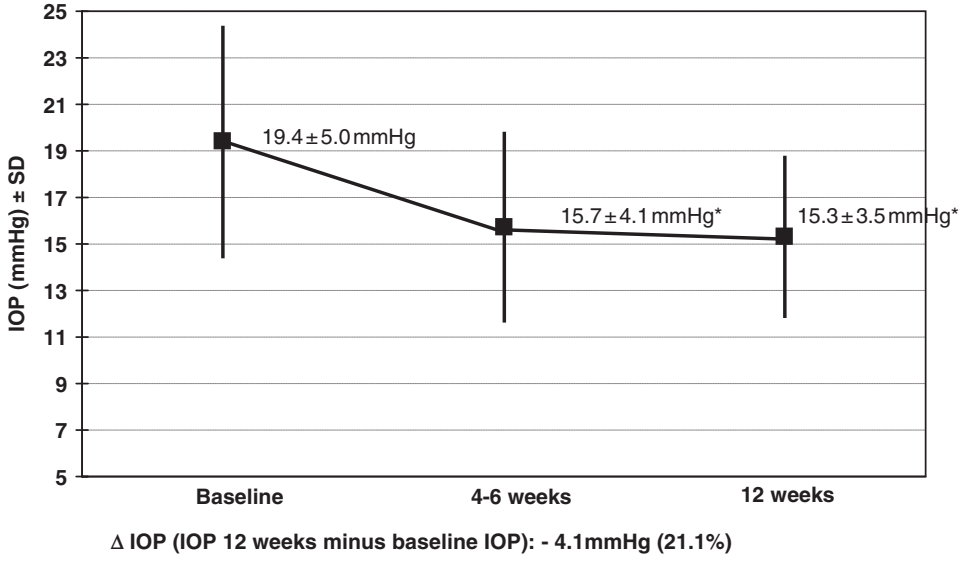

Figure 2. Mean intraocular pressure (IOP) ± standard deviation (SD) for all patients. *$p < 0.001$ vs. corresponding baseline, paired *t*-test.

Adverse events and terminations of treatment

All adverse events that were observed comprised fewer than 10% of all patients included in the study and none was serious: 47 of all patients (8.6%) terminated treatment during the 12 week follow-up period. A major reason for termination was a lack of efficacy which was reported for 17 of all patients (3.1%), followed by local intolerance ($N = 14$; 2.6%), systemic side effects ($N = 4$; 0.7%) and allergy ($N = 2$; 0.4%). All patients who terminated the treatment within the 12 week follow-up period were included in the IOP outcome analysis. Other reasons for termination of treatment included difficulties with the handling of the single-dose containers ($N = 4$; 0.7%) and 'other reasons' ($N = 6$; 1.1% of all patients).

Discussion

The results of this non-interventional, open-label, multicentre observational study demonstrate that preservative-free tafluprost can achieve good IOP control in a difficult patient population with poor IOP control and/or tolerability issues. Many patients had a complex treatment regimen prior to switching, including various drug classes and dosing schemes (Tables 4 and 5). Sixty patients (11.0%) were treated with a fixed combination prior change of medication, 79 patients (14.6%) received a non-fixed combination prior change of medication. There were two main reasons for switching therapy to preservative-free tafluprost: lack of efficacy of prior medication accounted for 60.7% and ocular symptoms and

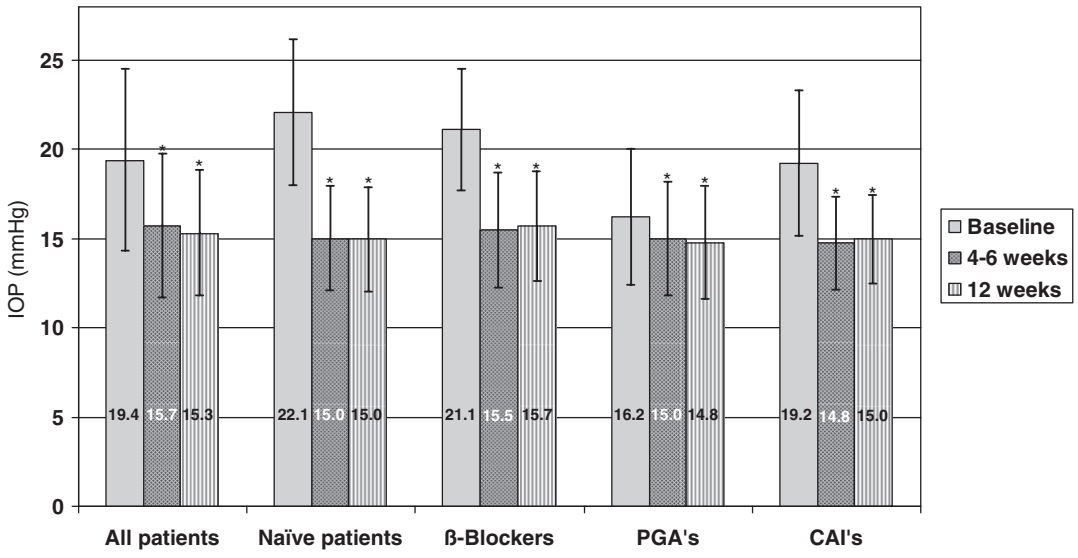

Figure 3. Mean intraocular pressure (IOP) ± SD is shown for all patients ($N = 544$) and for the subgroups of patients naïve to medical treatment, patients who were switched from a ß-blocker monotherapy, prostaglandin analogue (PGA) monotherapy or carbonic anhydrase inhibitor (CAI) monotherapy to a monotherapy with preservative-free tafluprost irrespective of the reasons for changing medication. *$p < 0.001$ vs. corresponding baseline, paired *t*-test.

Table 6. Development of mean intraocular pressure (IOP) at baseline and at final visit in patients with prior monotherapy stratified by major reason for changing medication to monotherapy with preservative-free tafluprost.

	N (eyes/ patients) at baseline	mean IOP (mmHg) baseline	mean IOP (mmHg) final visit	Δ IOP (mmHg)*	*p*-value
Lowering of IOP not sufficient/target pressure not achieved					
All patients	346/173	21.2	15.6	−5.6	<0.001
ß-blockers	176/88	21.5	15.8	−5.7	<0.001
PGAs†	48/24	20.2	16.3	−3.9	<0.001
CAIs††	76/38	20.1	15.5	−4.6	<0.001
Alpha-2 agonists	46/23	22.7	14.5	−8.2	<0.001
Clinical signs					
All patients	80/40	16.6	14.4	−2.2	<0.001
ß-blockers	6/3	20.2	13.0	−7.2	n/a**
PGAs†	62/31	15.5	14.1	−1.4	0.009
CAIs††	6/3	21.2	16.5	−4.7	n/a**
Alpha-2 agonists	6/3	20.2	16.5	−3.7	n/a**
Subjective symptoms					
All patients	110/55	15.3	14.6	−0.7	0.06
ß-blockers	10/5	17.3	14.6	−2.7	n/a**
PGAs†	82/41	14.9	14.8	−0.1	0.761
CAIs††	16/8	16.4	13.7	−2.7	n/a**
Alpha-2 agonists	2/1	12.5	11.5	−1.0	n/a**

*IOP at final visit minus IOP at baseline.
**Not analysed due to limited sample size.
†PGA: prostaglandin analogue.
††CAI: carbonic anhydrase inhibitor.

clinical signs for 30.7% of changes of treatment in all patients.

Preservative-free tafluprost 0.0015% lowered mean IOP significantly compared to mean pre-treatment IOP and in all subgroups of patients being treated prior with different monotherapy regimens. Secondly, in approximately one third of patients (30.7%) prior medication was changed due to tolerability issues and clinical signs like hyperaemia. Mean (treated) IOP at baseline was relatively low, 19.4 ± 5.0 mmHg. This may be an effect of the relatively high proportion of patients who were treated either with a PGA monotherapy ($N = 124$; 22.8%) or a fixed or non-fixed combination ($N = 139$; 25.6%) before changing medication. Regardless of low mean baseline IOP lower IOP values were achieved 12 weeks after changing medication in almost two thirds of all eyes ($N = 658$ eyes,

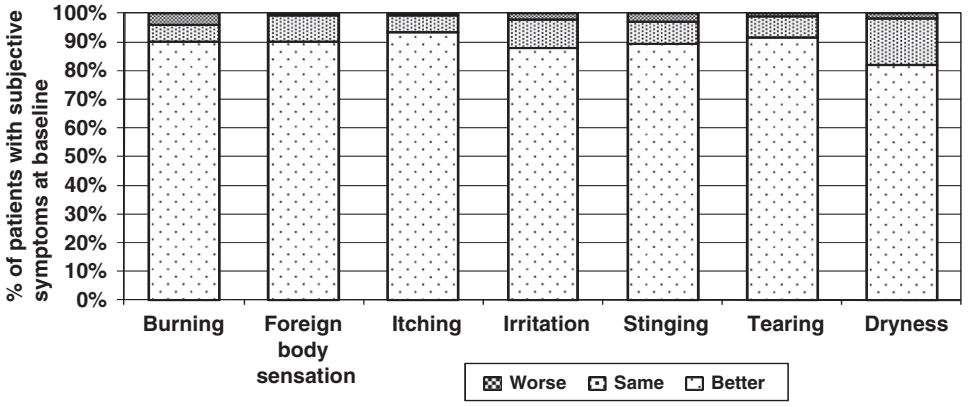

Figure 4. Development of subjective symptoms in all patients complaining of subjective symptoms with their medication at baseline 12 weeks after changing medication.

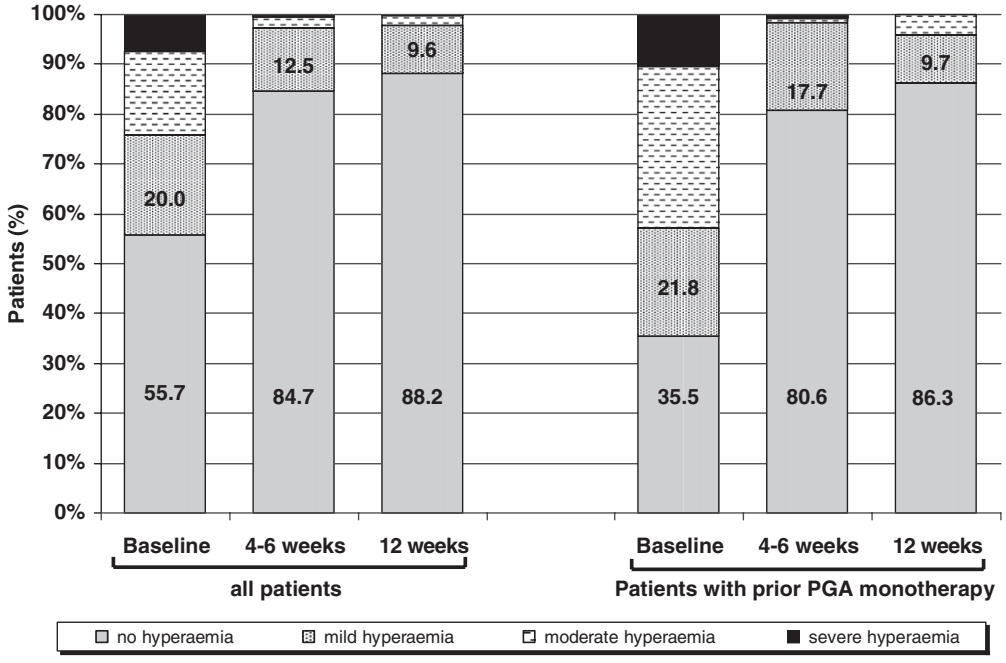

Figure 5. Percentage of patients with different severity of conjunctival hyperaemia in all patients and in the subgroup of patients treated with a prostaglandin analogue (PGA) monotherapy. The percentage of the different severities (none, mild, moderate and severe) for both groups of patients over the 12 week follow-up period is shown.

66.2%), IOP remained at the same level in 117 eyes (11.8%) and was higher in about one fifth ($N = 219$ eyes; 22.0%) of all eyes.

In treatment naive patients preservative-free Tafluprost lowered mean IOP from 22.1 ± 4.0 mmHg at baseline to 15.0 ± 2.9 mmHg at final visit which is equivalent to an IOP reduction of 7.1 mmHg. A similar effect was found by Uusitalo et al in patients after a wash-out period for their prior medications.[22] A large body of evidence from experimental and clinical studies exists showing that the long-term use of topical drugs containing BAK as a preservative may induce changes of the ocular surface, tear film instability, epithelial apoptosis conjunctival inflammation, and the loss of goblet cells[18–20]. After switching to preservative-free tafluprost subjective symptoms and clinical signs as well as local tolerability improved in most patients and overall patient satisfaction with their glaucoma treatment increased. Consistent with previous reports[21] our results confirm that patients with irritation of the ocular surface, subjective symptoms and clinical changes of the eye surface, such as hyperaemia may benefit from a change of medication to the preservative-free formulation of tafluprost. Clinical studies show that a high proportion of glaucoma patients that were treated over

long periods of time with preserved glaucoma medications developed symptoms like burning and stinging, foreign body sensation, dry eye and other symptoms consistent with ocular surface irritation. These symptoms were reported significantly less often in patients receiving preservative-free preparations[15,17].

A further important aspect in the medical management of glaucoma is the occurrence of ocular surface disorders. In a register study at 900 centres across Germany, with a total of 20.506 glaucoma patients, dry eye syndrome was diagnosed for 52.6% of patients, irrespective of glaucoma type[16]. In this study, the occurrence of dry eye syndrome increased with the number of antiglaucoma drugs used and with the duration of glaucoma disease. A possible explanation for this finding is that the majority of patients with glaucoma are treated with glaucoma medications over a long period of time that contain BAK as a preservative. Preservatives such as BAK are known to trigger dry eye syndrome.

This observational study is limited by its open-label design. Due to its observational nature, the study did not reveal any causal relationships. The observed IOP reduction after switching might be ascribed to the improvement of subjective symptoms and clinical signs and thus a better compliance but also by the patient population at baseline itself. Also, regression to the mean cannot be ruled out in the current study design since a control group was not used.

The results identify several factors associated with the use of a preservative-free formulation of tafluprost, such as an improvement in subjective symptoms and clinical signs, even in a group of patients with a high proportion of ocular symptoms and signs at baseline. Our data further suggest that a change of a monotherapy treatment regimen to preservative-free tafluprost is worthwhile for patients who are responding inadequately to another monotherapy treatment regimen. IOP was lowered significantly in this patient subpopulation and for all different therapeutic classes used before switching. In contrast to this finding a much smaller effect on IOP was observed after switching if the medication was changed due to tolerability reasons (clinical signs and subjective symptoms). Regarding the physicians' reasoning for changing patients from their prior medication and recommending the switch it can be assumed that this broad patient population is representative of patients who are likely to be prescribed a preservative-free glaucoma medication. A detailed analysis of the effects of preservative-free tafluprost used in concomitant therapy or as add-on to an existing medical treatment was not done in this study due to the limited number of patients in the different subgroups and the diversity in this patient population. Further studies with higher numbers of patients in the different subgroups are necessary to determine what aspects of preservative-free therapy with tafluprost account for the observed treatment effects.

Conclusion

In this observational study, preservative-free tafluprost 0.0015% was effective, well tolerated, and associated with fewer adverse events in a broad glaucoma and ocular hypertension patient population. Preservative-free tafluprost provided further IOP reduction in patients with poor IOP control and/or poor tolerance of their medication prior to tafluprost use. IOP reduction was also achieved for patients being switched from other monotherapies, including ß-blockers, CAIs and PGAs to a monotherapy with preservative-free tafluprost. In patients naïve to treatment, lower IOPs were achieved after initiating therapy. A change of medical therapy to preservative-free tafluprost may be beneficial, especially for patients with subjective ocular symptoms and/or clinical signs and patients with sensitive or dry eyes but also for patients who are not responding adequately to other monotherapy treatment regimens.

Transparency

Declaration of funding

This study was financially supported by Santen Oy, Tampere, Finland.

Declaration of financial/other relationships

A.H. has disclosed that he is a consultant to, and speaker for, Santen Oy. O.M.R. has disclosed that he has no financial or other significant relationships to Santen Oy. F.K. has disclosed that he is a consultant to Santen Oy. M.B. has disclosed that she is an employee of Santen GmbH Germany.

Some peer reviewers receive honoraria from *CMRO* for their review work. The peer reviewers of this paper have disclosed that they have no relevant financial relationships.

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