Efficacy and safety of brinzolamide 1% and timolol 0.5% fixed combination versus dorzolamide 2% and timolol 0.5% fixed combination in open-angle glaucoma

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Comparative study to assess efficacy and safety of brinzolamide 1% and timolol 0.5% fixed combination eye drops versus dorzolamide 2% and timolol 0.5% fixed combination eye drops in management of open-angle glaucoma

Background:

Primary open-angle glaucoma (POAG) is a multifactorial optic neuropathy characterised by degeneration of retinal ganglion cells, which can lead to progressive irreversible vision loss.

Elevated intraocular pressure (IOP) is the main modifiable risk factor for glaucoma. Therefore, effective control of IOP is the primary goal of glaucoma management.

Aim: To perform a comparative study assessing fixed-dose combinations of brinzolamide + timolol vs dorzolamide + timolol for topical treatment of primary open-angle glaucoma.

Rationale:

Prostaglandin analogues such as **latanoprost**, **travoprost** and **bimatoprost**, Carbonic anhydrase inhibitors (CAI) such as **dorzolamide** and **brinzolamide**, and beta blockers such as **timolol** are some of the primary classes of commercially available anti-glaucoma agents, commonly used as first-line treatment for POAG.

Fixed combination hypotensives can reduce IOP thereby slowing progression of visual field loss, and their simplified treatment regimen can improve adherence.

Study design and patient selection

12-week prospective, comparative, randomised, interventional trial

- Age **≥18 years**
- Newly diagnosed **POAG**
- Baseline IOP **>21 mmHg**
- Not on any prior **systemic or topical medications**

Group 1 (BT, n = 30) **received brinzolamide 1% and timolol 0.5% fixed combination eye drops** — ♀ 13, ♂ 17

Group 2 (DT, n = 30) **received dorzolamide 2% and timolol 0.5% fixed combination eye drops** — ♀ 14, ♂ 16

Evaluation time points
2, 4, 8, 12 weeks

Complete ophthalmic exam
Goldmann applanation tonometry
IOP at 9am and 4pm

Follow-up
IOP
Side effects
Drug tolerability patient preference for drugs was noted

Results

Morning | Evening

Reduction in mean IOP compared to baseline

	Group 1 (BT) Morning	Group 1 (BT) Evening	Group 2 (DT) Morning	Group 2 (DT) Evening
2 weeks	6.94±1.21	7.34±1.43	6.40±1.30	6.37±1.10
	P = 0.10		P = 0.10	
4 weeks	8.47±1.43	9.00±1.52	7.77±0.88	7.57±0.92
	P = 0.02		P = 0.02	
8 weeks	9.24±1.51	9.60±1.71	7.93±0.99	7.74±0.98
	P = 0.002		P = 0.002	
12 weeks	9.60±1.55	10.0±1.57	8.40±0.84	8.14±0.85
	P = 0.004		P = 0.004	

At 8 and 12 weeks, mean reduction in morning IOP was **significantly greater** in **Group 1 (BT)** than in **Group 2 (DT)** (P<0.05)

At all follow-ups, **Group 1 (BT)** had a **substantially greater drop** in evening IOP than **Group 2 (DT)** (P<0.05)

Conclusion

brinzolamide 1% and timolol 0.5% vs **dorzolamide 2% and timolol 0.5%**

brinzolamide 1% and timolol 0.5% were found to be more effective at IOP reduction and favoured by participants

Study limitations and future outlook

- Short duration
- Limited sample size
- Results might not be applicable to **other types of glaucoma** and **other brands of the same active chemicals**

In order to assess safety and clinical effects, **larger and longer-term studies are needed**

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