

Assessment of Topical Drug Instillation Techniques among Glaucoma Patients in a Tertiary Institution in Nigeria

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Introduction: Topical ocular pharmacotherapy is usually the first line of therapy to treat elevated intraocular pressure (IOP).^{1,2} Multiple factors can influence adherence to medications. An important factor that is often overlooked is the method of eye drop instillation. This study assessed the method of eye drop instillation among patients with primary open angle glaucoma (POAG) in a tertiary hospital.

Materials and Methods: Forty -three patients with POAG were recruited during the World Glaucoma Week celebration for this non-randomized interventional study. Participants completed a semi-structured questionnaire and were instructed to instill an artificial tear eyedrop just as they would instill their topical glaucoma medications at home. Participants were uniformly educated on proper drug instillation by an ophthalmologist and thereafter had a post-test to re-assess their instillation techniques. Parameters assessed were as follows: time (in seconds) taken to instill medication, delivery of eyedrops into conjunctival cul-de-sac, closure of eyes after drug instillation as well as observing tear duct occlusion.

Results: Forty-three participants diagnosed with POAG and on pressure lowering medications were interviewed. The age range was 18- 83years with a mean age of 55 ± 15.3years. Majority of the participants were males 31 (72%) (Table 1). Eighteen (41.9%) had been on medical treatment for POAG for more than nine years.

Thirty-two (74.4%) patients used fixed dose combination therapy, and majority (69.8%) instilled their medications twice daily (Table 2). Eleven (25.4%) respondents had not received health education on drug instillation techniques and about 60% reported that they did not occlude their tear ducts after drug instillation.

Table 1: Sociodemographics of 43 study participants

Variables	Participants N=43 Freq (%)
Age (years)	
≤20	2(4.7)
21-40	4(9.3)
41-60	25(58.1)
>60	12(27.9)
Mean Age ±SD	55 ± 15.34
Sex	
Male	31(72.1)
Female	12(27.9)
Level of education	
None	2(4.7)
Primary	9(20.9)
Secondary	17(39.5)
Tertiary	15(34.9)
Best corrected Distant visual Acuity in Better Eye	
>6/18	16(37.2)
<6/18	27(62.8)
Duration of medical treatment for Glaucoma	
1-3years	12(27.9)
>3-6years	8(18.6)
>6-9years	5(11.6)
>9years	18(41.9)
Average cost spent monthly on glaucoma medications	
≤N5,000(≤\$11)	8 (18.6)
>N5,000(>\$11)	35(81.4)
National Health Insurance scheme(NHIS) subsidy cost for glaucoma medications	
Yes	8 (18.6)
No	35(81.4)

Table 2: Pattern of use of medications among 43 study participants

VARIABLES	N=43 FREQ (%)
Therapy Regimen	
Monotherapy	11(25.6)
Fixed-dose combination Therapy	32 (74.4)
Number of times drugs are instilled daily	
Once daily	10(23.2)
12hrly (Twice daily)	30(69.8)
8hrly (Three times daily)	3((7.0)
Have you received health education on drug instillation techniques?	
Yes	32(74.4)
No	11(25.6)
Do you occlude your tear duct following drug instillation?	
Always	4(9.3)
Sometimes	13(30.2)
Never	26(60.5)

Pre-assessment of drug instillation techniques among Glaucoma patients

Twenty-eight (65.1%) of the participants instilled their medications within 15seconds, 21(48.8%) delivered the eyedrop into the inferior cul-de-sac, 28(65.1%) closed the eyes after instilling the eyedrop and 10(23.3%) occluded the tear duct after instillation (Figure 1).

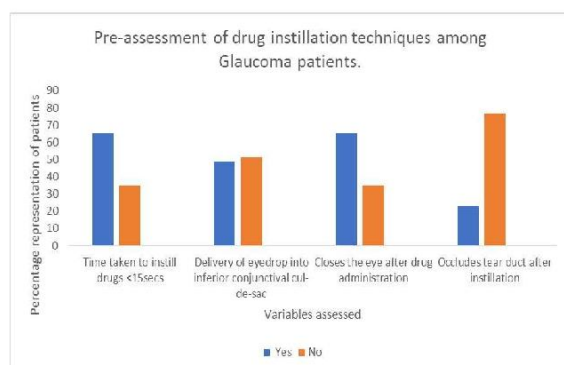


Figure 1: Pre-assessment of drug instillation techniques among glaucoma patients

Post- assessment of drug instillation techniques among glaucoma patients

There was an improvement in all techniques observed. Thirty-three (76.7%) of the participants instilled their medications within 15seconds, 31(72%) delivered the eyedrop into the inferior cul-de-sac, 38(88.3%) closed the eyes after instilling the eyedrop and 23(53.5%) occluded the tear duct after instillation (Figure 2).

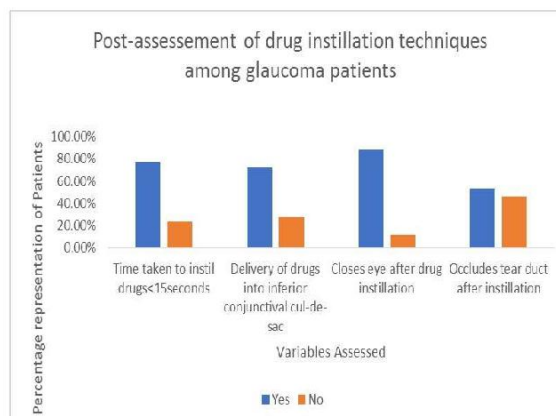


Figure 2: Post assessment of drug instillation techniques among glaucoma patients

Discussion: The pre-test observation in our study showed that majority of participants instilled their drugs within 15 seconds, delivered the eye drops on target (inferior conjunctival cul-de-sac) and closed their eyes after instillation, but did not occlude their tear ducts thereafter. Lanier et al³ in his study demonstrated a relationship between nasolacrimal duct occlusion and drug efficacy. This association should be considered when educating patients on drug instillation techniques. A post-test evaluation showed an improvement in all parameters assessed for topical drug instillation. This corroborates the study done by Newman-Casey et al⁴ which demonstrated that educational interventions often led to significant improvements in medication adherence. Patients who are on topical medication should be adequately instructed on the proper techniques for self- instillation of eye drops and motivated to use these techniques.

Conclusion: This study highlights an increased need for proper education of patients on drug instillation techniques.

References

1. Fatima Kyari, Mohammed Abdull, Dan Kiage, Adunola Ogunro. Medical treatment of open-angle glaucoma. *Community Eye Health*. 2012; 25(79-80):77-79.
2. M.M Abdull, Clare Chandler, Clare Gilbert. Glaucoma, "the silent thief of sight": patients' perspectives and health seeking behavior in Bauchi, northern Nigeria. *BMC* 2016; 44
3. Lanier OL, Manfre MG, Bailey C, Liu Z, Sparks Z, Kulkarni S, Chauhan A. Review of Approaches for Increasing Ophthalmic Bioavailability for Eye Drop Formulations *AAPS Pharm SciTech*. 2021;22(3):107
4. Newman- Casey PA, Weizer JS, Heisler M, Lee PP, Stein JD. Systematic review of educational interventions to improve glaucoma medication adherence. *Semin Ophthalmol*. 2013;28(3):191-201.