



A DESCRIPTIVE STUDY OF TREATMENT ADHERENCE AND ASSOCIATED FACTORS AMONG GLAUCOMA PATIENTS

Ophthalmology

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ABSTRACT

Glaucoma is the second commonest cause of blindness and commonest cause of irreversible blindness worldwide introduced by silent course and progressive optic neuropathy causing visual field loss associated with elevated intraocular pressure. Hence IOP control with topical anti glaucoma eye drops is main aim in Glaucoma management requiring strong medication adherence for which our study is concerned as it's a crucial factor for better disease progression control. This study is organized to calculate non-adherence and it's determining factors with help of patient's self reports about their medications. This was an observational study including 86 outpatients diagnosed as glaucoma, taking Glaucoma treatment in form of topical eye drops. We verified total number of eye-drop instillation per week by multiplying the daily total number of prescription doses of eye-drops by 7 days; then we assessed that how much number of times the patients missed to instil their eye drops during last week through patient's questionnaires. This total number of missing doses was subtracted from the total number of prescription doses for a week and this obtained resulting value was divided by the total number of prescription doses for 7 days, then this resulted final value multiplied by 100 which represent the percentage of medical adherence rate of patient. Patient was defined as 'Adherent' to prescribed medication, if mean adherence rate was $\geq 80\%$, and 'Non-adherent' was defined as mean adherence rate was $< 80\%$. If the data of total number of daily dosage regimen prescribed by physician were different from patient's self-reports, then patient will be considered not to be following the prescription and was therefore defined as 'Non-adherent'. Almost 54.65% patients were found non-adherent to topical glaucoma medication in our study and according to our results, it is concluded that unawareness of glaucoma patients for their disease consequences and forgetfulness of patients for instilling their eye drops were the most common and most important factors influencing glaucoma medication adherence greatly. Hence; these factors should be considered with a proper seriousness during topical glaucoma therapy. Other factors like patient's employment during study presentation, dependency on other person for instilling eye drops also presented their own influences on medication adherence of glaucoma patients in this study.

KEYWORDS

Glaucoma, Intra Ocular Pressure, Medication Adherence, Forgetfulness

INTRODUCTION

Glaucoma is introduced by progressive optic neuropathy with marked functional and structural abnormalities in the eye leading to a particular pattern of optic disc changes¹ and visual field loss² associated with elevated intraocular pressure.³

Glaucoma is the second commonest⁴ cause of blindness and commonest cause of irreversible blindness worldwide with silent clinical course.⁵

Lowering intraocular pressure (IOP) is main aim of glaucoma management and is primary focus of current and new therapies. Current Glaucoma management depends upon medical therapy, laser or surgery based upon underlying pathology and disease severity.⁶ Hence; in our study we are concern about medication adherence in glaucoma patients because medical management is more important than surgical management of glaucoma.

In routine medical management of Glaucoma, topical eye drops (having drugs as monotherapy or combination therapy among 5 drug classes-Prostaglandin analogue, Beta adrenergic blocker, Carbonic anhydrase Inhibitor, Alpha adrenergic agonist, cholinergics) are prescribed to patients for lifelong period, but this topical antiglaucoma therapy requires a strong adherence of patients to their prescribed medication regimen for better disease progression control.

This medication "adherence" is developed by active following of patients to their prescribed medication regimen and "persistence" to medication is continuous use of glaucoma medicines and may be affected by patient's adherence.^{9,10}

There are multiple determinants for poor treatment adherence, including poor understanding of treatment aims, medication side effects and multiplicity of eye drops, treatment cost, poor instillation techniques (including physical barriers) and forgetfulness.⁷

Identifying Non-adherence is very important and challenging for achieving good medication adherence. We can calculate non-adherence by patient's self reports about their eye drops instillation during questionnaire based interviews.

MATERIALS AND METHODS

This was a non-interventional, single centre, cross-sectional, descriptive type of observational study conducted at private Hospital, Jaipur, Rajasthan.

In our study, we included outpatients with diagnosis of glaucoma as subjects, who were at least 20 years old, taking Glaucoma treatment in form of topical eye drops and treatment is continuous from at least 1 month but less than 2 years with their written consent.

We excluded patients with hospitalization history for glaucoma treatment just prior to study interview and patients with serious/unstable medical disease.

PLAN OF ACTION: We found out Medication adherence rate of patients during their regular medical visit and analysed it's all determinant factors like demographic, medical characteristics and medication habits through their self reported questionnaires.

Then we calculated Medication Adherence Rate of our all study patients with help of following formula:

$$\text{Medication Adherence Rate (MAR)} = \frac{(\text{daily total number of prescription doses} \times 7 \text{ days}) - (\text{Number of prescription doses that was missed during the past week})}{\text{Weekly total number of prescription doses for eye drops}} \times 100$$

We verified total number of eye-drop instillation per week by multiplying the daily total number of prescription doses of eye-drops by 7 days; then we assessed that how much number of times the patients missed to instil his/her eye drops during last week through patient's questionnaires. This total number of missing doses was subtracted from the total number of prescription doses for a week and this obtained resulting value was divided by the total number of prescription doses for 7 days, then this resulted final value multiplied by 100 which is the medical adherence rate of patient in percentage.

Patient was defined as 'Adherent' to prescribed medication, if mean adherence rate was $\geq 80\%$, and 'Non-adherent' was defined as mean adherence rate was $< 80\%$. If the data of total number of daily dosage regimen prescribed by physician were different from patient's self reports, then patient will be considered not to be following the prescription and was therefore defined as 'Non-adherent'.

Statistical Analysis: Linear variables were summarised as Mean and Standard Deviation and analysed by using Unpaired 't' test and other parametric tests.

Nominal/Catagorical variables expressed as Proportions (%) and analysed by using “Chi-Square test” and “Fisher-exact test”.

'p' value less than 0.05 has taken as significant.

Mad-Calc 16.4 version software has been used for all statistical calculation.

OBSERVATION AND RESULTS

Patient's Socio-Demographic Characteristics:

- In this study of total 86 patients, 52.33% were males, hence; more males than females.
- Average age was 62.63 years (SD±14.04) and 53.49% were <65 years old in our study.
- About 24.42% patients were reported to be working in any employment at the time of data collection and nonworking and retired population were 45.35% and 30.23% respectively.
- 33.72% of study patients required assistance for instillation of eye drops.

Medication Adherence

In this study of total 86 patients, 45.35% were adherent, while 54.65% were non-adherent to their prescribed medication.4.65%; whose self-reported drug prescription was not corresponding with physician's prescription; were documented as Non adherent.

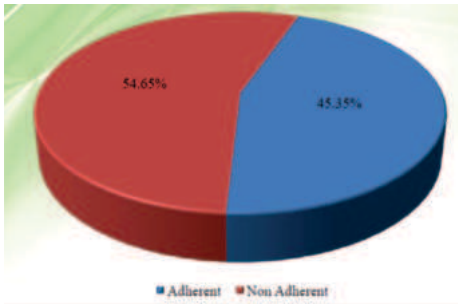


Fig.1:- Distribution Of Study Participants According To Their Medication Adherence For Topical Glaucoma Therapy

The Mean Medication Adherence Rates of the total, the adherent and the non-adherent were 67.96% (SD 28.51), 91.01% (SD 5.72) and 48.84% (SD25.51), respectively with 'p' value<0.001. Thus, there was an approximately 42.17% difference in the medication adherence rate between the Adherent and Non-adherent patients.

Table 1:- Statistical Values of Medication Adherence Rate

Adherence	No.	Mean MAR	SD	Median	25-75 P	'P' value
Adherent	39	91.01	5.72	92.8	85.710-95	<0.001
Non Adherent	47	48.84	25.51	57.14	29.760-71.283	
Total	86	67.96	28.51	74.65	57.14-90.6	

It is very important to notify that Working group in this study is very Non adherent (only 33.33% Adherent) to their Glaucoma medication. (OR 1.939, 95% CI: 0.693 to 5.429).

An important factor which we obtained that patients who required assistance for instilling their eye drops, showed a poor Adherence (37.93% Adherent) for Glaucoma medication. (OR 1.580, 95% CI: 0.634 to 3.934).

The most common reasons found for missing Glaucoma medication dosages were disorientation of patients about their disease consequences ('p' value <0.001) and forgetfulness for instilling their eye drops ('p' value <0.009).

Table 2:- Statistical Values of probable Causes of Missing Glaucoma Medication Dosage

Probable Causes of Missing Dosages	Patient's adherence				'p' value
	Adherent		Non adherent		
	No.	%	No.	%	
Transiently finished drug	3	7.69	9	19.15	0.211
Discomforts by drug	8	20.51	7	14.89	0.574
Disorientation about consequences	3	7.69	28	59.57	<0.001
Forgetfulness	26	66.67	17	36.17	0.009

Almost 24.41% patients withdrawn from their Glaucoma medication in this study. Most common cause for this withdrawal was Unawareness of patients for their disease ('p' value <0.001).

Table 3:- Factors Causing Withdrawal from Glaucoma Medication

Drug Withdrawal Factors	Patient's adherence				'p' value
	Adherent		Non adherent		
	No.	%	No.	%	
Drug cost	0	0.00	5	10.64	0.061
Drug unavailability	0	0.00	4	8.51	0.123
Drug side effects	4	10.26	2	4.26	0.404
Lack of motivation	0	0.00	4	8.51	0.123
Unawareness	0	0.00	12	25.53	<0.001
Lack of treatment persistency	0	0.00	4	8.51	0.123
Patients with no withdrawal	35	89.74	30	63.83	0.006

Hence; on basis of this study, it has been proved that forgetfulness and unawareness of patients about their disease consequences are most important factors that influenced glaucoma medication adherence of patients very greatly.

CONCLUSION

Medication adherence of Glaucoma patients generally found low because of very silent progression of glaucoma disease and absence of typical symptoms until its last stages. In this study, we aimed to investigate factors which influence medication adherence among Glaucoma patients.

Almost more than 50% patients were found non-adherent to topical glaucoma medication in our study and according to our results, it is concluded that unawareness of glaucoma patients for their disease consequences and forgetfulness of patients for instilling their eye drops were the most common and most important factors influencing glaucoma medication adherence greatly. Hence; these factors should be considered with a proper seriousness during topical glaucoma therapy.

Other factors like patient's employment during study presentation, dependency on other person for instilling eye drops also presented their own influences on medication adherence of glaucoma patients in this study.

Finally; on basis of whole summary of our study outcomes, we suggest use of some reminders (Automated reminders along with electronic reminding devices, telecommunication and involvement of family members) or using smart drop bottles (Opticare Arthro, Kali drop, Travatan Dosing Aid; Travalert)¹⁰ and gel/spray based formulations (Nyogel ; Timolol 0.1%) with negligible preservatives and simplified once daily dosing along with proper patient education⁸ and financial supportive anti glaucoma schemes for poor patients.^{9,10}

Self IOP monitoring with home tonometers (Icare) is also advisable for better patient adherence for anti glaucoma medications.⁹

Another option is longer acting therapies with minimizing patient's need for constant medication instillation which stabilize IOP with minor fluctuations like injectable drug depots (Intracameral injection of Travoprost/Bimatoprost)and implants(Bimatoprost ring /Travoprost punctum plug) for effective elimination of forgetfulness in glaucoma management.¹⁰

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