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Study on Causes of Noncompliance to Anti-glaucoma Medication in Glaucoma Patients

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Abstract

Purpose: To have an in-depth understanding regarding the compliance of patients, their knowledge and attitude towards AGM (Anti-Glaucoma Medication) and also to explore various factors affecting AGM compliance in glaucoma patients attending a medical college attached hospital in Hyderabad, Telangana.

Materials and Methods: We have done a cross-sectional study in ophthalmology outpatient department of two teaching hospitals in South India. Data collection was done with the help of a modified questionnaire previously published in studies. A total of 27 questions were included in the questionnaire. The data was collected. MS-Excel was used for coding. It was then analyzed using SPSS software (version 20, IBM USA).

Results: A total of 229 patients were recruited in the study. Of them 56.3% were males and 43.7% were females. The mean age of patients in our study group was 55.03 years. In our study there was no correlation between age, gender and expenditure on AGM and compliance. 170 (74.2%) patients did not miss their AGM dosage in a month. The most common reason for missing their AGM was forgetfulness and the next common reason was 'medication got over'. We found an association between patients using AGM for longer duration and better compliance (p value=0.026), but there was no correlation between age, gender and expenditure on AGM and compliance.

Conclusion: Our study was done on patients who have come to the OPD for follow up, their compliance would be better than the patients who do not come for follow-up examinations. Hence community-based studies need to be conducted to know more regarding the reasons for lack of compliance. Also, ophthalmologists need to pay attention to the issue of non-compliance toward AGM among glaucoma patients attending the hospitals. A support system to remind patients about glaucoma medications is required to improve compliance.

Keywords: Anti-glaucoma medication; Compliance; Primary open angle glaucoma.

Introduction

Glaucoma is a multifactorial degenerative optic neuropathy. Glaucoma is characterized by the death of retinal ganglion cells. Glaucoma is the second leading cause of blindness after cataracts [1] and poses a major public health issue because its associated blindness is irreversible. In India, it ranks third after cataracts and refractive errors [2]. Risk factors of glaucoma include age above 60 years, family history of glaucoma, high myopia, history of steroid use, history of ocular injury. It is estimated that 57.5 million people worldwide are affected by primary open-angle glaucoma (POAG). It is estimated that about 76 million people will be affected with glaucoma by 2020, and it is expected to reach 111.8 million by 2040 [3]. The prevalence of

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glaucoma in India is 11.9 million [4]. 12.8% of blindness in India is due to glaucoma [5]. The global burden of irreversible vision loss from glaucoma is on raise in aging population. Glaucoma's pathogenesis involves genetic, immune, and vascular factors. The only modifiable risk factor for treating glaucoma is intraocular pressure (IOP). Medical management is the first-line treatment for most adult glaucomas, but the effect of medical management in treating the disease solely depends on the compliance of the patient and the caregivers. This poses as a major challenge to the treating physician to stress on the importance of compliance to anti-glaucoma medication (AGM). Non-compliance results in inability of the antiglaucoma medication to achieve its goal. It gives a false opinion to the clinician regarding the efficacy of that drug in that patient.

Need for the Study: This study was done to have an in-depth understanding regarding the compliance of patients, their knowledge and attitude towards AGM and also to explore various factors affecting AGM compliance in glaucoma patients attending medical college attached hospitals in Hyderabad, Telangana.

Materials and Methods

A cross-sectional study was done on 229 patients diagnosed with POAG (Primary Open Angle Glaucoma) after approval from Institutional Ethics Committee of the hospital. This study was conducted at two teaching hospitals in Hyderabad after undertaking an MOU. The sample size was calculated based on previous studies. Patients were recruited from two hospitals proportionately. This was based on the number of patients with POAG in each hospital.

Inclusion Criteria: Patients on AGM for at least 1 month or more, for primary open angle glaucoma were included in the study. The diagnosis of primary glaucoma was confirmed by a glaucoma specialist. The glaucoma specialist who confirmed glaucoma clinically and the interviewer who asked the questions were two different persons. All the patients who were ready to take part in the study gave a verbal consent. They underwent their routine glaucoma review. A standardized questionnaire inspired by previously published studies was used for data collection. The patients were interviewed using this questionnaire by a senior postgraduate in ophthalmology department in the outpatient department (OPD). A total of 27 questions were included in the questionnaire. First part of the questionnaire included demographic characters such as age, sex and education. Second part of the questionnaire tested patients knowledge regarding method of application of AGM. Last part of questionnaire was on compliance attitude, reasons for non-compliance and stocking and purchase of AGM by the patients. In this study, 'Compliance' means patient did not miss any of his/her medication for the last one month. 'Non-compliance' in this study was taken as missing dose of antiglaucoma medication in the last one month.

Exclusion Criteria: Patients who were on AGMs for less than three months, patients who underwent glaucoma surgery or laser treatment were excluded from the study.

Statistical Analysis: The sample size was 229. It was calculated assuming 5% level of significance, prevalence of glaucoma to be 12% with margin of error being 4.2%. A descriptive analysis was done. Data was collected and coded using MS-Excel, then analyzed with SPSS (version 24, IBM USA).

Results

A total of 229 patients were recruited in the study. Of them 56.3% were males and 43.7% were females. The mean age of patients in the study group was 55.03 years. The questionnaire was answered by patients (66.8%) and attendants (33.2%).

197 patients (86.02%) were non-professionals, and 32 patients (13.98%) were professionals [6].

44 patients (19.2%) were on AGM for more than 2 years, 14 patients (6.1%) were on AGM for 1 to 2 years, 95 patients (41.5%) were on AGM for 6 months to 1 year and 76 patients (33.2%) were on AGM for 6 months.

One hundred and eleven patients (48.14%) bore the medical expenditure by themselves, 118 (51.86%) depended on their family members for buying their medicines. 107 patients (46.78%) applied AGMs on their own while 68 (29.81%) patients depended on other for instilling medication and 54 patients either instilled the eye drops by themselves or depended on others (Figure1, Table 1).

Table 1: Who applies medication?

Reason	No. of Patients	Percentage
Self	107	46.78%
Others	68	29.81%
Both Self and Others	54	23.58%

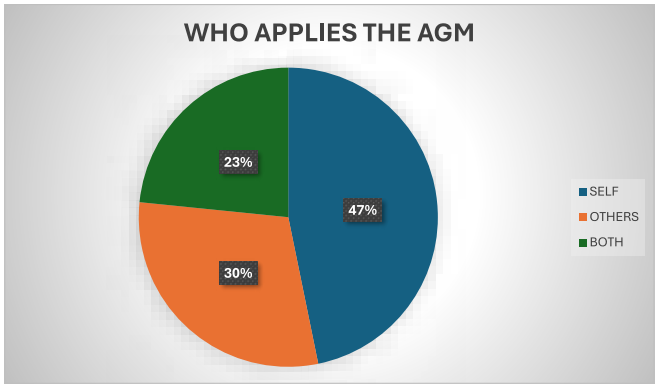

Figure 1: Who applies to the AGM?

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Of the study group 44 patients (20.1%) were using more than 3 AGMs, 113 patients (49.3%) were using 2 AGMs and 72 patients were using 1 AGM.

205 patients (89.51%) closed their eye after drug application, 11 patients (4.80%) kept their eyes open (Table.2).

Table 2: Do you close your eyes or open after instilling eye drops?

Reason	No. of Patients	Percentage
Close	205	89.51%
Open	11	4.80%
Both	13	5.67%

192 patients (83.8%) were educated regarding eyedrop instillation method either by their physician or by nursing staff.

Despite of that 163 patients (71.17%) were not practicing punctal occlusion, 66 patients (28.83%) did punctal occlusion after AGM instillation (Figure 2, Table 3).

Table 3: Practice of punctal occlusion

Answer	No. of Patients	Percentage
Yes	66	28.82%
No	163	71.17%

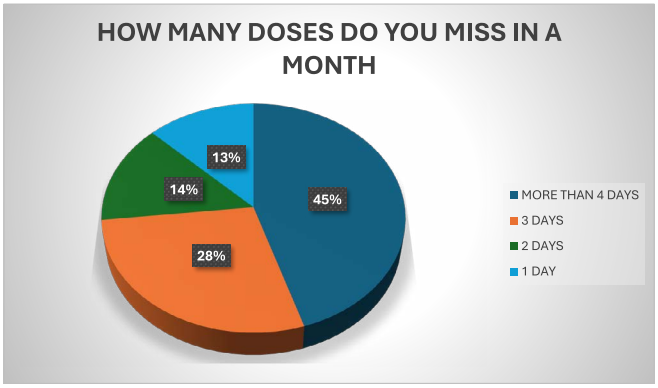

Figure 3: Showing number of doses missed by the patients in a month.

Regarding the patients awareness on side effects of AGM only 48 patients (21%) were aware of the side effects while 181 patients (79%) were unaware of the side effects of AGM.

In questionnaire regarding stocking of medicines (AGM) 35(15.8%) patients did not have the concept of stocking,78 patients (34.1%) bought only one bottle of AGM at a time. 84 patients (36.1%) bought 2 bottles of AGM at a time and 32 patients (14%) bought 3 bottles of AGM at a time.

Regarding the expenditure burden of AGM s 163 patients (71.6%) said that cost of AGM was a financial burden for them (Table 4).

In questionnaire on compliance towards AGM 170 (74.2%) patients did not miss their AGM dosage in a month (Figure 3, Table 5, 6).

Table 5: Do you miss any of your doses in one month

Answer	No. of Patients	Percentage
Yes	45	19.65%
No	170	74.23%
Sometimes	14	6.11%

Table 6: How many doses do you miss in a month

No. of Days	No. of Patients	Percentage
More than 4 days	32	45.07%
3 days	20	28.16%
2 days	10	14.08%
I day	9	12.67%

Table 7: If drops application is missed, why?

Reason	No. of Patients	Percentage
Forgetfulness	76	64.95%
Lack of information	3	2.56%
Medication got over	22	18.8%
Other commitments	3	2.56%
No reason	13	11.11%

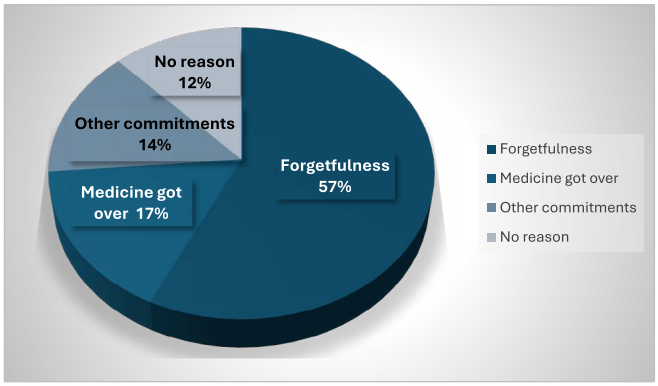

Figure 4: If drops application is missed, why?

The most common reason for missing their AGM was forgetfulness (Table 1) and the next common reason was 'medication got over' (Figure 4, Table 7).

The study found an association between patients using AGM for longer duration and better compliance (p value=0.026), but there was no correlation between age, gender and expenditure on AGM and compliance.

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Table 8: Reason for taking the medication regularly.

Reason	No. of Patients	Percentage
Awareness	65	33.85%
Routinely sincere in taking medication advised by doctor	71	36.97%
Awareness & routinely sincere in taking rx.	5	2.60%
Fear factor	32	16.66%
Fear factor and awareness	3	1.56%
All the above	16	8.33%

Discussion

Poor compliance to AGM is seen worldwide. This needs to be addressed because AGM is still the first line of treatment in most of the glaucoma patients. Proper compliance to AGM can result in retarding the progression of glaucoma [7]. The treating Glaucoma specialist should play a vital role in constantly emphasising the importance of compliance to AGM. A systematic review on AGM compliance of patients has shown that the rates of compliance varied between 24%-98% [8].

In this study 74.2% patients were compliant to their AGM. This is higher than the previous studies. A study was done by Ramesh PV et al. [6] on AGM compliance of literate patients with glaucoma. In their study 50.5% patients were compliant to AGM. In another study done by Rajurkar K, et al 51% of patients were compliant to AGM [9]. The non-compliance rates in other developing countries of Asia were found to be varied: Israel (29%) [10], Hong Kong (63.4%) [11], Taiwan (75.8%) [12], Saudi Arabia (19.4%) [13], and Pakistan (65.5%) [14].

The higher compliance to AGM in this study could be because most of the patients were having advanced glaucoma and received more intensive counselling from health care workers right from the ophthalmology residents to the treating Glaucoma specialist in every visit.

The most common cause of noncompliance was forgetfulness which can be attributed to aging population. Few patients were complaining regarding 'no betterment of vision inspite of using medication'. This was seen in patients who started using AGM for less than 6 months.

Our review from other studies of Asia has shown that most common causes of noncompliance were difficulty in `opening the bottle [10], older age [13,15], and patients from rural areas [12,15]. In studies from India, factors causing non-compliance were dose forgetfulness [9,16,17] and cost [17].

In this study there was no correlation between age, gender and expenditure on AGM and compliance.

Patients living alone and those who depended on others for administering AGM had more propensity to non-compliance.

This study found an association between patients using AGM for longer duration and better compliance. This could be due to increased awareness of patients regarding the disease and the understanding that it can cause silent blindness. They would have been given multiple counselling sessions regarding the compliance to AGMs.

Similar to the other studies [18] the relation between treating ophthalmologist and patient plays a crucial role in patients' compliance to AGM in this study. According to the results of the study, explaining the patient regarding Glaucoma and the impact of Glaucoma if they are noncompliant towards AGM promotes adherence of the patients to medication.

Limitations of the Study

One of the limitations of the study is that it is questionnaire based. This could result in overestimation of the results on compliance. Since this study was done on patients who have come for follow up, their compliance would be better than the patients who do not come for follow-up examinations regularly. Hence community-based studies need to be conducted to know more regarding the reasons of noncompliance.

Conclusion

Ophthalmologists and Glaucoma specialists need to pay attention to the issue of non-compliance towards AGM among glaucoma patients attending the hospitals. A support system to remind patients about glaucoma medications is required.

As a measure to improve compliance of the patients, we have specifically trained a nurse to counsel them regarding glaucoma and stress on the need for compliance to AGM .The caregiver along with the patient is also being emphasized regarding compliance attitude and the need for regular follow ups especially in condition like Glaucoma which is a 'Sneak thief of sight!'

QUESTIONNAIRE

1. **Demographic characters:**
   a. Age
   b. Sex:
   c. Education

   A. University B. High school C. Middle school D. Illiterate

2. The response is provided by:
   - Patient
   - Attender
3. Expenses related to your eye drops will be covered by whom?

4. Who applies the medications for you?
5. Since how many months/years have you been using AGM?
6. Number of anti-glaucoma medication you are using?
7. In which position do you apply your eye drops? A. Sitting B. Lying down C. Both
8. Do you close or open your eyes after applying the medication?
9. After applying medications, how long do you typically keep your eyes closed?
10. Do you apply pressure at the corner of your eye with your finger after administering the eye drops?
11. Have you received instructions from your doctor or nurse on how to apply the medication?
12. Are you adhering to their instruction given?
13. Number of bottles of each drug you purchase at one time?
14. When do you typically buy your next bottle(s)?
    A. Purchase before the current bottle is finished
    B. Purchase as soon as the current bottle is finished
    C. Purchase at random (at convenience)
    D. Keep a stock (purchase well in advance)
15. How long does each bottle of eye drops last for you?
16. When you are administering two or more eye drops, what steps do you take when one bottle is depleted?
    A. Keep a stock of medications and use from it.
    B. Purchase just before running out.
    C. Purchase after medications are finished.
17. Will you buy enough medication to last until the next review date (3-4 months)?
18. If the answer is no, please specify whether cost is a factor in purchasing all the medications.
19. How many days after your medication runs out are you buying?
20. Are you Professional or Non-professional?
21. Are the medications costly for your income?
22. Are you missing any of your prescribed doses?
23. If applicable, how many days per week do you typically miss your dose?
24. If yes, how many days per month do you miss your dose?
25. Reason why the drops application was missed?
26. If you use it regularly, then what is the reason?
27. Do you know the side effects of your eye drops?
28. If yes, how did you come to know about the side effects?

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