

Patient-reported barriers to glaucoma medication access, use, and adherence in southern India

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The objectives of the study were to (a) describe the different types of problems that patients in southern India reported having when taking their glaucoma medications and (b) examine the relationship between patient reported-problems in taking their glaucoma medications and the self-reported patient adherence. A survey was conducted by clinical staff on 243 glaucoma patients who were on at least one glaucoma medication in an eye clinic in southern India. We found that 42% of patients reported one or more problems in using their glaucoma medications. Approximately 6% of patients reported being less than 100%

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adherent in the past week. Unmarried patients and patients who reported difficulty squeezing the bottle and difficulty opening the bottle were significantly more likely to report nonadherence.

Key words: Access, adherence, barriers, glaucoma, medication, problems, southern India

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It is estimated that by 2010 approximately 8.2 million people in India will have open-angle glaucoma and 3.7 million will have angle closure glaucoma, which translates to approximately 18.4% and 23.7% of the world's open-angle glaucoma and angle closure glaucoma, respectively.^[1] In a study conducted in rural and urban populations in southern India, glaucoma was found to be responsible for 10.2% of bilateral blindness.^[2] The absence of symptoms in almost all glaucoma patients increases the risk of treatment nonadherence among these patients.

Prior work conducted in southern India examined why patients who felt the need for eye care did not utilize eye services.^[3,4] To our knowledge, no prior study in India has examined self-reported problems of patients and adherence to glaucoma medications. Prior work in India has examined barriers and facilitators that affect adherence to antiretroviral medications and the patterns of prescribing and dispensing of medications by pediatric resident physicians.^[5-7]

Despite the availability of effective medications for glaucoma and greater awareness of the importance to follow these treatment regimens, patient nonadherence to prescribed therapy continues to be a significant problem.^[8,9]

The purpose of the current study was to (1) describe the different types of problems reported by the patients in India when taking their glaucoma medications and (2) examine the relationship between patient-reported problems in taking their glaucoma medications and patient adherence to treatment.

Materials and Methods

A survey to assess patient-reported problems and adherence to glaucoma medications that had been used in a prior U.S. study^[9] was translated into Tamil; it included questions about the access to medication that were relevant to glaucoma patients living in India. The questions used to assess medication adherence were originally taken from the Brief Medication Questionnaire (BMQ).^[10] The BMQ is a validated self-report measure of adherence.^[10] Appendix A contains the questionnaire.

The study was approved by the Aravind Institutional Review Board. Patients who received care at a large subspecialty glaucoma clinic in southern India participated in the survey. The survey questions were distributed by trained clinical staff to consecutive adult glaucoma patients taking glaucoma medications over a period of one month in 2006. The clinical staff assisted glaucoma patients who needed help. The survey was completed by 243 patients before they visited their ophthalmologists.

All analyses were performed using SPSS (version 14.0). Descriptive statistics were calculated. Next, we examined the bivariate relationships between the independent and dependent variables using Fisher's exact tests and *t*-tests.

Results

Table 1 presents the demographic characteristics. Table 2 presents information about patient access to medications. Patients living in rural areas (28%) reported to take an hour or longer to get to their pharmacy than patients living in urban areas (11%; Fisher's exact test = 0.002).

Forty-two percent of patients reported one or more problems in using their glaucoma medications. Table 3 presents the types of patient-reported problems experienced by them. Younger patients were significantly more likely to report having difficulty paying for their medications (*t*-test = 2.00, *P* = 0.04) and getting their drops in their eyes (*t*-test = 2.27, *P* = 0.02) than older patients.

Approximately 6% of patients reported being less than 100% adherent to their glaucoma medications in the past week. Difficulty squeezing the bottle (Fisher's exact test, *P* = 0.04), difficulty opening the bottle (Fisher's exact test, *P* = 0.02), and not being married (Fisher's exact test, *P* = 0.016) were significantly related to whether the patient reported being less than 100% adherent to glaucoma treatment.

Discussion

Forty-two percent of patients reported one or more problems in using their glaucoma medications. Younger patients were significantly more likely to report difficulty paying for their medications and getting their drops in their eyes. This is an important finding and suggests that ophthalmologists and their clinical colleagues need to assess and make sure that patients, and especially the younger ones, know how to put their eye drops in. Also, providers need to assess whether patients, and especially those who are younger, can afford their medications, and if not, possibly prescribe something less expensive or help them receive their medications for free.

Table 1: Patient demographic characteristics (N = 243)

	Percent (N)
Sex	
Male	64.2 (156)
Female	35.8 (87)
Lives in rural or urban area	
Urban	59.3 (144)
Rural	40.7 (99)
Length of time with glaucoma	
Less than 1 year	25.9 (63)
1 to 2 years	21.8 (53)
More than 2 years	51.8 (126)
Number of glaucoma medications	
1	81.5 (198)
2 or 3	18.5 (45)
Number of times per day the patient takes glaucoma medications	
1	23.9 (58)
2	68.3 (166)
3	6.2 (15)
4	0.8 (2)
Missing	0.8 (2)
Number of other non-glaucoma eye medications	
None	83.5 (203)
1	7.4 (18)
2	4.1 (10)
3	4.9 (12)
Education	
1 to 12 years	71.2 (173)
More than 12 years	19.8 (48)
Missing	9.1 (22)
Marital status	
Married	88.1 (214)
Not married	11.9 (29)
Patient states that a specific glaucoma medication bothers him/her	
Yes	5.8 (14)
No	94.2 (229)
Glaucoma medications patient is supposed to be using but is not	
Patient is not using glaucoma medications that he/she should be using	2.5 (6)
Patient is using all glaucoma medications that he/she should be using	97.5 (237)
Patient administers drops himself	
Patient does not always administer himself	11.1 (27)
Patient always administers himself	88.9 (216)
Less than 100% adherent in past week	
Yes	5.8 (14)
No	94.2 (229)

Table 2: Access to medications (N = 243)

	Percent (N)
How do you usually get your medication?	
I go to the pharmacy to pick up my medication.	67.9 (185)
Someone else picks up my medications at the pharmacy for me for free.	26.7 (65)
I pay someone to pick up my medications at the pharmacy for me.	4.5 (11)
How far is the pharmacy from your home?	
Less than 5 kilometers	61.3 (149)
More than 5 kilometers, less than 10 kilometers	8.6 (21)
More than 10 kilometers	29.6 (72)
How much time does it take to get to the pharmacy?	
Less than 30 minutes	62.1 (151)
Between 30 minutes and 1 hour	19.8 (48)
More than 1 hour to less than 2 hours	8.6 (21)
More than 2 hours	9.1 (22)
How do you or your caregiver get to your pharmacy?	
Walk	32.5 (79)
Bike	21.4 (52)
Bus	41.5 (101)
Cart	3.3 (8)
Cab	0.8 (2)

Table 3: Reported Problems /Difficulties in Taking Glaucoma Medications (N=243)

	Percent (N)*
Drops fall on cheek	8.6 (21)
Problem paying	21.8 (53)
Too many drops come out	9.9 (24)
Can't get drops in eyes	9.9 (24)
Side effects	3.3 (8)
Hard to squeeze the bottle	4.5 (11)
Difficulty remembering	10.7 (26)
Hard to open bottle	2.5 (6)
Dosage times inconvenient	7.0 (17)
Other	2.1 (5)

*The percentages do not total 100% because patients could report one or more problems.

Patients who reported difficulty opening their glaucoma eye drop bottle and squeezing the bottle were significantly more likely to report being less than 100% adherent. Providers should make sure to assess whether patients have difficulty opening their eye drop bottles and squeezing them. If the patients are having difficulty in these two areas, then providers could suggest that a family member or a friend help patients administer the eye drops.

It is also interesting that unmarried patients were significantly more likely to report being less than 100% adherent. Providers should make sure to ask unmarried patients about what types of social support they have and whether they need assistance in managing their glaucoma.

The providers could then help the patient find resources in their community to assist them in managing their glaucoma if this is needed.

The study has several limitations. The clinical staff did not track those patients who refused to complete the survey. Second, the study enrolled only patients who were at the clinic for a glaucoma visit. Future research should examine the barriers to medication use among those in the community with glaucoma who have not returned for follow-up examinations.

The generalizability of the study is limited because all patients were recruited at a single glaucoma clinic in southern India. Approximately 60% of the clinical patients stated that they lived in an urban area, which reflects the characteristics of individuals that receive care at this hospital. However, in other clinics in southern India, more patients might be from rural areas. The educational level reported by the patients reflects the educational level of patients living in this area of India. Despite the limitations, the study provides new information about the extent to which patients in India have problems getting and taking glaucoma medications and factors that contribute to patient adherence.

Conclusions

Forty-two percent of patients reported one or more problems in using their glaucoma medications. Approximately 6% of patients reported being less than 100% adherent to their glaucoma medications in the past week. Difficulty squeezing the bottle, difficulty opening the bottle, and not being married were significantly related to whether patients reported being less than 100 percent adherent.

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Appendix A: Survey Instrument

Date ___/___/___ ID: _____

Glaucoma Medication Study

1. About how long have you had glaucoma?
 - a. Less than 6 months
 - b. 6 months to less than 1 year
 - c. 1 to 2 years
 - d. More than 2 years to less than 5 years
 - e. 5 years or more
2. In which eye do you have glaucoma? _____
 - a. right
 - b. left
 - c. both
3. How many different glaucoma medication bottles do you use? _____
 - 3.1 How many other eye medication bottles do you use? _____

*The next set of questions asks only about your glaucoma medications, so please think only about your glaucoma medications when answering them. Here is a list of commonly prescribed glaucoma medications:

4. Did you use glaucoma medication(s) for your eyes in the PAST WEEK? (circle one)
 - a. Yes
 - b. No

If you answered Yes, please complete the following:

- 4.1 Please list below all glaucoma medications you used for your Right eye in the PAST WEEK. For each medication you list, please answer each of the following questions in the boxes below.
 - a. Medication brand name
 - b. How many days did you use it in the past week?
 - c. How many times per day did you use it?
 - d. How many drops did you use each time?
 - e. How many times did you miss taking it?
 - f. How well does the medicine work for you?
1 = well, 2 = okay, 3 = not well
- 4.2 Please list below all glaucoma medications you used for your Left eye in the PAST WEEK. For each medication you list, please answer each of the following questions in the boxes below.
 - a. Medication brand name
 - b. How many days did you use it in the past week?
 - c. How many times per day did you use it?
 - d. How many drops did you use each time?
 - e. How many times did you miss taking it?
 - f. How well does the medicine work for you?
1 = well, 2 = okay, 3 = not well
5. Do any of your glaucoma medications bother you in any way? (please circle one)
 - a. Yes
 - b. No
- 5.1 If you answered Yes, please name the medication and explain how it bothers you.

Name of Glaucoma Medication	In what way does it bother you?
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 - a.
 - b.
 - c.
 - d.

6. How much problem or concern, if any, are you having in the following areas? (please circle)

	None	A little	A lot
a. My medication causes side effects	0	1	2
b. It is hard to remember all the doses	0	1	2
c. It is hard to pay for the medications	0	1	2
d. The dosage times are inconvenient	0	1	2
e. It is hard to open the bottle	0	1	2
f. It is hard to get the drops in my eye	0	1	2
g. Too many drops come out at the same time	0	1	2
h. Drops fall on cheeks	0	1	2
i. It is hard to squeeze the bottle	0	1	2
j. My medication causes other problems or concerns	0	1	2

If other problems or concerns explain: _____

7. Are there any prescription glaucoma medications that you are supposed to be using but are not? (circle one)

- a. Yes
- b. No

7.1 If you answered Yes, please name the medication and explain why you are not using it.

Name of Glaucoma Medication

Why are you not using it?

- a.
- b.
- c.
- d.

8. How often do you administer your own glaucoma medications? (circle one)

- a. Always
- b. Most of the time
- c. Some of the time
- d. Never

If your answer is Always, skip to Question # 9.

8.1 When someone else puts glaucoma medication drops in your eye, who is that person usually? (circle one)

- a. Spouse/partner
- b. Child
- c. Sibling
- d. Housekeeper
- e. Caretaker
- f. Other: _____

8.2 Why do you require someone else to put in your glaucoma medications? (circle all that apply)

- a. Inadequate vision
- b. Trouble with my hands (manual dexterity)
- c. Fear
- d. Difficulty in only getting one drop out of the bottle
- e. Difficulty getting the medication in my eye
- f. Other: _____

9. How far is the pharmacy you use from your home? (circle one response)

- a. Less than 5 km
- b. More than 5 km, less than 10km
- c. More than 10 km

10. How much time does it take to get to the pharmacy you use?

- a. less than 30 minutes
- b. between 30 minutes to 1 hour
- c. more than 1 hour to less than 2 hours
- d. more than 2 hours

11. How do you or your aid get to your pharmacy?

- a. walk
- b. bike

- c. bus
 - d. cart
 - e. cab
 - f. other
12. Do you understand the reason for taking your glaucoma medications? (circle one)
- a. Yes
 - b. No
13. Do you feel that missing just one of your glaucoma medication's doses makes much of a difference to your eye health? (circle one)
- a. Definitely yes
 - b. Probably yes
 - c. I don't know
 - d. Probably no
 - e. Definitely no
14. How old are you? _____ years
15. How many years of schooling have you completed? _____ years
16. Are you male or female? _____
17. What is your current marital status? (circle one)
- a. Currently married
 - b. Legally separated
 - c. Divorced
 - d. Widowed
 - e. Never married
 - f. Other (specify): _____
18. In general, how would you say your health is? (circle one)
- a. Excellent
 - b. Very good
 - c. Good
 - d. Fair
 - e. Poor
19. In general, how would you say your vision is? (circle one)
- a. Excellent
 - b. Very good
 - c. Good
 - d. Fair
 - e. Poor
20. How many other prescription medications do you regularly take in addition to your eye medications?
_____ medications

*The medication names in the Tamil version of the survey were changed to reflect medications available in India.

**Questions 9 through 11 were added to the survey for specific use in India.