

Glaucoma medication non-compliance in Hebron, Palestine

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ABSTRACT

BACKGROUND: The purpose of this study was to determine patient characteristics, estimate the extent of compliance of glaucoma patients with medication, the technique of drop instillation, and follow-up clinic visits.

MATERIAL AND METHODS: We interviewed all glaucoma patients attending their regular follow-up visits, over three months, at St. John Eye Hospital, Hebron, Palestine. A questionnaire with 34 questions was used to fill patient responses. The questions dealt with patient characteristics: glaucoma treatments, and their awareness and attitudes towards different components of non-compliance with medical treatment. We also observed the patient's practice of instilling placebo eye drops.

RESULTS: We interviewed 44 patients: 33 females (75%) and 11 males (25%). Patients using more than one drop constituted 63% of patients. 82% of patients affirmed "Not missing doses last week", and 52% stated that they "Never stopped taking drops in the past", while only 36% of files showed drop compliance. 91% of patients claimed to make follow-up visits on time, while documented follow-up compliance was 64%.

CONCLUSION: This study revealed a poor agreement between subjective compliance and file records among Palestinian patients with glaucoma visiting our clinic. We need to educate our glaucoma patients about the disease and its complications, drop administration technique, compliance with drop administration, and clinic visits.

KEY WORDS: glaucoma; non-compliance; medication compliance; follow-up visit compliance; Hebron

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INTRODUCTION

Glaucoma is a slowly progressive and initially asymptomatic disease characterized by optic nerve atrophy and visual field loss. Glaucoma is the leading cause of worldwide irreversible blindness [1, 2]. Glaucoma presents many challenges to long-term patient compliance with therapy.

Glaucoma patients need continuing treatment after disease detection. Therefore, compliance with medical treatment is a significant concern. Reported compliance rates from glaucoma studies have differed widely from five to 80% [3].

Medical management of glaucoma depends primarily on the administration of topical ocu-

lar medications. Non-compliance with prescribed treatments has proven to be a significant problem for effective glaucoma management. Kass et al. [4] found that most patients overestimate their compliance and that physicians cannot determine which patients adhere to the prescribed therapy.

Another obstacle in the medical treatment of glaucoma is the improper administration of ocular drops by patients. Inadequate data on the prevalence of improper administration techniques exist, but it may be as high as 80% [5, 6].

The outcomes of this study are to estimate compliance with medication, compliance with the technique of drop instillation, and follow-up visit compliance.

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MATERIAL AND METHODS

We performed a descriptive study of all glaucoma patients attending their regular follow-up visit at St. John Eye Hospital, Hebron, for three months. The researcher interviewed patients who agreed to be included in the study post their regular clinic visit. The researcher explained the purpose of the study to each patient and used a questionnaire to collect patient responses. The questionnaire and scoring system were composed by the researcher and were never validated by previous studies. The questionnaire had 34 questions grouped into four sections illustrated in Figure 1. The first section dealt with the patient's characteristics, features of their disease, and the number of drops used. The second section dealt with the patient's knowledge and attitude. The third section dealt with treatment compliance. For each question in the second and third sections, the researcher explained the multiple answers, and the patient's answers were recorded. The fourth section dealt with the drop administration technique. First, the researcher asked the questions, answers were noted, and then the researcher witnessed how the patient instilled artificial teardrops.

The overall score of the knowledge and attitude questions (second section) was calculated by summing the positive responses ("Yes"; "Yes, always"; "Always"). We divided patients' scores into four groups: "Excellent knowledge" (> 75%), "Good knowledge" (50–75%), "Poor knowledge" (25–50%), and "Very poor knowledge" (< 25%). The overall score of the compliance questions (third section) was calculated by summing the positive responses ("Never missed"; "Seen at least every six months"; "Yes"; "No"). We divided patients' scores into four groups: "Excellent compliance" (> 75%), "Good compliance" (50–75%), "Poor compliance" (25–50%), and "Very poor compliance" (< 25%). The overall score of the technique questions (fourth section) was calculated by summing the positive responses ("Yes, always"; "Yes"). We divided patients' scores into four groups: "Excellent technique" (> 75%), "Good technique" (50–75%), "Poor technique" (25–50%), and "Very poor technique" (< 25%). Drop administration, and contamination scores were calculated by summing observations of positive technique (drops "on target"; "no contamination"). The researcher obtained verbal consent for participation in the study from all patients. The identity of patients was concealed to maintain confidentiality.

We defined non-compliance in this study as missing at least one drop per week and/or irregularity of doctor visits (lapse between visits > six months).

RESULTS

Patient characteristics of 44 patients reviewed in our study are presented in Table 1. The majority of our patients were female and homemakers, who had glaucoma for less than five years, had medical insurance and paid 14–86 USD out-of-pocket/month for drops, were illiterate, or had primary schooling.

We compared the knowledge, compliance, and technique among our patients according to the results of their scores (Tab. 2). Knowledge was excellent in most categories, but poor knowledge was seen when patients were asked to rate glaucoma severity and when asked about awareness of risks of missing glaucoma drops. We graded overall knowledge as good, with 60% of patients responding positively to the knowledge questions.

Compliance with drops was excellent in most categories, with 82% of patients reporting using their drops the previous week. Clinic visit follow-up compliance was 91%. We graded overall medication compliance as excellent, with 79% of patients responding positively to the compliance questions. We found excellent compliance in 76–87% for different patient categories (Tab. 3).

We found that 80% of patients showed excellent "drop administration technique". We observed tip contamination in 59% of cases, although 55% of patients responded otherwise in the questionnaire. Patients showed very poor results for "closing punctum after applying drops" and for "Waiting for three or more minutes between drops". We graded the overall technique as a poor technique.

DISCUSSION

Non-compliance is a multifaceted challenge in chronic silent diseases such as glaucoma, where patients are not familiar with the effect of non-compliance for a long time. To make matters worse, newer drugs, disagreements between ophthalmologists about the most effective medication, and their high costs pose a problem for patients with glaucoma, which could lead to non-compliance.

We observed in our study that the overall compliance to be 79% and follow-up compliance was 91% (40/44 files). We should interpret these results cautiously because of the contradicting information extracted from patients' files where 16 files (16/44) showed more than six-month lapses between visits, which decrease compliance from 91% to 64%. Similarly, 23 patients replied that they never stopped

1	Hosp. Reg. No:	<input type="checkbox"/>	2	D.O.B:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Gender:	Male:	<input type="checkbox"/>	Female:	<input type="checkbox"/>	4	Eyes treated:	Unilateral:	<input type="checkbox"/>	Bilateral:	<input type="checkbox"/>				
5	Duration of treatment:	< 5 y - 10 y:	<input type="checkbox"/>	> 10 - >15y:	<input type="checkbox"/>										
6	VF abnormality in best eye (if BE are affected):	Not done:	<input type="checkbox"/>												
	MILD (< - 6 dB):	<input type="checkbox"/>	MODERATE (- 6 to -12 dB):	<input type="checkbox"/>	SEVERE (> - 12 dB):	<input type="checkbox"/>									
7	Do you currently have a job:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>	Retired:	<input type="checkbox"/>	Home maker:	<input type="checkbox"/>	9	Do you have Medical insurance:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>
8	Education level:	Illiterate:	<input type="checkbox"/>	Read & Write:	<input type="checkbox"/>	10	Type of insurance:	MOH:	<input type="checkbox"/>	UNRWA:	<input type="checkbox"/>	Private:	<input type="checkbox"/>		
	Primary:	<input type="checkbox"/>	Secondary:	<input type="checkbox"/>	11	Does insurance cover Glaucoma drops:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>					
	College:	<input type="checkbox"/>	University & higher:	<input type="checkbox"/>	12	Other chronic systemic conditions:	13	Other chronic eye conditions:	14	Glaucoma bottles used:					
	None:	<input type="checkbox"/>	DM:	<input type="checkbox"/>	HTN:	<input type="checkbox"/>	MD, HTN, Heart D:	<input type="checkbox"/>	Other:	<input type="checkbox"/>	None:	<input type="checkbox"/>	1:	<input type="checkbox"/>	
	Other:	<input type="checkbox"/>	Other:	<input type="checkbox"/>	15	Glaucoma surgery:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>					
16	Amount paid out-of-pocket/ month for drops (USD):	14-86:	<input type="checkbox"/>	86-171:	<input type="checkbox"/>										
17	Do you understand the reason for drops:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>										
18	Do you understand that missing one of your doses makes much of a difference to your eye health:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>	I don't know-No body told me:	<input type="checkbox"/>								
19	Patients' rating of Glaucoma severity:	Mild:	<input type="checkbox"/>	Moderate:	<input type="checkbox"/>	Sever:	<input type="checkbox"/>	Don't know:	<input type="checkbox"/>						
20	Do you visit your doctor on-time for follow-up:	Yes, Always:	<input type="checkbox"/>	Sometimes:	<input type="checkbox"/>	No:	<input type="checkbox"/>								
21	Do you take drops on time:	Always:	<input type="checkbox"/>	Sometimes:	<input type="checkbox"/>										
22	Patient reminded by others to take drops:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>										
23	Reasons for missing drops (all that apply):	Never missed:	<input type="checkbox"/>												
	Cost:	<input type="checkbox"/>	Being away from home:	<input type="checkbox"/>	No money:	<input type="checkbox"/>	Forgetfulness:	<input type="checkbox"/>							
	Ran out of medication:	<input type="checkbox"/>	Late refill:	<input type="checkbox"/>	Meds not available:	<input type="checkbox"/>	No visual benefit:	<input type="checkbox"/>							
24	Patient follow-up compliance:	Visit at least every 6M:	<input type="checkbox"/>	Lapse between visits > 6M:	<input type="checkbox"/>										
25	Non-compliance due to:	Med. S/E (stinging,redness.):	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Its hard to get drops in eye:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>								
	Its hard to remember all doses:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Many drops come out at same time:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>									
	Its hard to pay for medication:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Drops fall on cheek:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>									
	Dosage times are inconvenient:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Its hard to squeeze bottle:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>									
	Its hard to open the bottle:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>	Medication cause other problems:	Agree <input type="checkbox"/>	Disagree <input type="checkbox"/>									
26	Did you use glaucoma drops in your eyes last week:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>										
27	Have you stopped taking drops in the past:	No:	<input type="checkbox"/>	Yes:	<input type="checkbox"/>										
28	Does dropper tip touch the eye:	Yes, always:	<input type="checkbox"/>	Never-rare:	<input type="checkbox"/>										
29	Do you use fingers to hold open eye:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>										
30	Which lids are held:	Upper & Lower:	<input type="checkbox"/>	Upper:	<input type="checkbox"/>	Lower:	<input type="checkbox"/>	Don't know:	<input type="checkbox"/>						
31	Do you close punctum after applying drops:	Yes, Always:	<input type="checkbox"/>	Sometimes:	<input type="checkbox"/>	Never:	<input type="checkbox"/>								
32	Wait for 3 or more minutes between drops:	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>										
33	Drop administration technique:	On target:	<input type="checkbox"/>	Missing eye:	<input type="checkbox"/>	No one with patient:	<input type="checkbox"/>								
34	Contamination was noted (tip touched eye):	Yes:	<input type="checkbox"/>	No:	<input type="checkbox"/>										

FIGURE 1. The questionnaire and scoring system

drops in the past while there was evidence in their files showing that in seven cases (seven files out of 23), either the patient ran out of medication or it

was noted that they stopped drops on their own, which decreases compliance in this category from 52% to 36%.

Table 1. Patient characteristics					
Category	No	%	Category	No	%
Age group			Visual field abnormality in best eye		
< 50–69 years	25	57%	Mild (< -6 dB)	13	30%
70–≥ 80 Years	19	43%	Moderate (-6 to -12 dB)	4	9%
Gender			Severe (> -12 dB)		
Female	33	75%	Not done	15	34%
Male	11	25%	Glaucoma surgery		
Medical insurance			Yes	9	20%
Yes	40	91%	No	35	80%
Ministry of Health			Eyes treated		
United Nations Relief Works Agency (UNRWA)	8	18%	Bilateral	28	64%
No	4	9%	Unilateral	16	36%
Does insurance cover glaucoma drops?			Other chronic eye conditions		
Yes	1	2%	None	22	50%
No	39	89%	Diabetic retinopathy	2	5%
Educational level			Cataract	8	18%
Illiterate — Primary	31	70%	Other	12	27%
Secondary — University	13	30%	Other chronic systemic conditions		
Amount paid/month for drops [USD]			None	16	36%
14–86	41	93%	Diabetes, hypertension, heart disease	10	23%
86–171	3	7%	Diabetes	3	7%
Occupation			Hypertension	8	18%
Yes	6	14%	Other	7	16%
No	2	5%	Number of glaucoma bottles used		
Retired	7	16%	1	16	36%
Home maker	29	66%	2	23	52%
Duration of treatment			3	5	11%
< 5–10 years	36	82%			
> 10– > 15 years	8	18%			

Masoud et al. [7] found compliance with medication prescriptions for glaucoma about 50% among the Arab population in Israel. In other studies, non-compliance among glaucoma patients varied; 38% by Spooner et al. [8], 24.7% by Gurwitz et al. [9], 75.2% by Khandekar et al. [10]. In a survey of glaucoma patients in Canada [11], 27.9% were found non-compliant with their eye drop administration, and about a third demonstrated improper administration technique. The explanations for this wide variation could be due to different definitions, different levels of education, different methods of payment for medications, and different patterns of behavior between patients in different countries.

In our study, compliance was slightly higher in males [82% (9/11)] than females [79% (26/33)]. Djafari et al. [12] and Khandekar et al. found no

significant relationship between non-compliance and gender. Bloch [13] reported higher non-compliance rates in males than females, but Aziz et al. [14] reported worse non-compliance among females than males. In the same report, Aziz et al. identified that non-compliance was highest in the elderly. In our study, there were no significant differences in non-compliance between the different age groups. Support for elderly people by other family members in Palestinian society may have resulted in better compliance among elderly patients.

Khandekar et al. reported that glaucoma patients had very high compliance rates for regular follow-up visits and judiciously adhered to dosage frequencies. Our study showed the same results.

Overall knowledge of glaucoma was good in 60% of patients. Khandekar et al. reported 23.8%

Table 2. Knowledge, compliance, and technique scores						
	Excellent		Good		Poor	
	No.	%	No.	%	No.	%
Knowledge						
Do you understand the reason for drops?	28	64%			16	36%
Do you understand that missing out one of your drop doses makes much of a difference to your eye health?	14	32%			30	68%
Patients' rating of glaucoma severity	12	27%			32	73%
Do you visit your doctor on-time for follow-up?	35	80%	6	14%	3	7%
Do you take drops on time?	43	98%	1	2%		
Overall knowledge		60%				
Compliance	Excellent		Good		Very poor	
	No.	%	No.	%	No.	%
Reminded by others to use drops	40	91%			4	9%
Follow-up compliance	40	91%			4	9%
Used drops last week	36	82%			8	18%
Have you stopped taking drops in the past?	23	52%			21	48%
Overall Compliance		79%				
Technique	Excellent		Poor		Very Poor	
	No.	%	No.	%	No.	%
Does tip of dropper touch the eye?	24	55%	4	9%	16	36%
Do you use fingers to hold an open eye?	37	84%			7	16%
Do you close punctum after applying drops?	4	9%	1	2%	39	89%
Wait for 3 or more minutes between drops	9	20%			35	80%
Observed: Drop administration technique (No. = 41)	33	80%			8	20%
Observed: Contamination (tip touched eye) (No. = 41)	15	37%			26	59%
Overall Technique		42%				
Observed technique and contamination		59%				

Table 3. Compliance for different categories				
	Compliant		Non-compliant	
	No.	%	No.	%
Gender				
Female (n = 33)	26	79.0%	7	21.0%
Male (n = 11)	9	82.0%	2	18.0%
Age group				
< 50–69 y (n = 25)	19	76.0%	6	24.0%
70–≥ 80 y (n = 19)	16	84.0%	3	16.0%
Educational level				
Illiterate — Primary (n = 31)	25	81.0%	6	19.0%
Secondary — University (n = 13)	11	85.0%	2	15.0%
Duration of treatment				
< 5–10 y (n = 36)	28	78.0%	8	22.0%
> 10– > 15 y (n = 8)	7	87.0%	1	13.0%

on knowledge of glaucoma, and Lau et al. [15] reported 10.2% on knowledge of glaucoma symptoms. While 43 patients replied that they took drops on time, logs in 21 files showed notes such as “non-compliant with drops”.

Patel and Spaeth [16] found that the main reasons provided by patients for non-compliance included forgetfulness (39%), while Taylor et al. [17] also reported that patient forgetfulness was the number-one reason for non-compliance. In our study, 50% of non-compliant patients reported “ran out of medication”.

Overall observed technique and contamination were 59% and graded as good. Out of 41 patients, four missed the eye, and four did not know how to instill the drops, while in 26 patients contamination of dropper tips was observed.

The study has several limitations. First, the measure of compliance was subjective. Second, glaucoma patients attending Ministry of Health (MOH), United Nations Relief Works Agency (UNRWA), and other private clinics were not represented in our study (their characteristics could differ from our study). Third, the small number of patients in our research and the small number of male patients (these could be attributed to the study design) made multivariate and subgroup analysis not feasible. Fourth, because the researcher conducted the study (based on patients’ responses), we cannot rule out social desirability bias. Therefore, we should interpret our results with caution regarding glaucoma patients in Palestine.

Information on non-compliance components is also important in formulating the policies to improve awareness and counseling of patients with glaucoma while prescribing medications.

Improving compliance with glaucoma medication regimens is critical, and future research in this area is required. Patient compliance is essential for effective medication intervention and to reduce the peripheral and central loss of vision.

CONCLUSION

This study revealed a poor agreement between subjective compliance and file records for Palestinian patients with glaucoma. This demands larger studies to confirm the results and reveal relevant issues in improving patients’ compliance. We need to teach our glaucoma patients about the disease and its complications. We also must make sure the patients know how to instill their

drops, and last, we must teach patients about the importance of compliance with drop administration and clinic visits. [18] Recommended plans to improve compliance may include: Improve patient-physician communication, education, and motivation through leaflets, use of smart technology (smartphones as a reminder), rethinking of new drug delivery systems, early laser or surgical interventions [19].

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NIL.

Conflict of interest

NIL.

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