Compliance with treatment of patients with chronic open-angle glaucoma

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SUMMARY The compliance with treatment of 168 patients with chronic open-angle glaucoma was studied. 42% of the patients missed at least some of their medication. Patients were more likely to miss doses in the middle of the day than in the morning or evening. Two factors found to improve compliance were the knowledge of the name of their eye disease and the possible ill effects of having no treatment. Patients were more likely to be poor compliers if they had been prescribed medication to be used 3 or 4 times a day than if they had been told to use treatment only twice a day.

The number of patients in the United Kingdom diagnosed as having chronic open-angle glaucoma has been estimated as 100 000.¹ It is generally accepted that treatment (surgical, medical, or both), aimed at reducing the intraocular pressure improves the prognosis.

The success of medical treatment of glaucoma depends on the co-operation of the patient. The fact that this is not always complete has been well documented.²⁻⁶

Patients may be prescribed a variety of treatments for their glaucoma. The traditionally used miotics have unpleasant side effects⁷ and are usually prescribed to be used 4 times per day. The recently introduced beta blockers (in the form of eye drops) have fewer side effects and are generally used twice a day.

The purpose of this investigation was to compare defaulters with nondefaulters in terms of prescribed treatment as well as personal characteristics. It was thought that different medications might lead to different degrees of compliance, and it was hoped to discover differences that might point to possible ways of improving compliance.

Patients and methods

The data were obtained as part of a larger study of patients with chronic open-angle glaucoma in the Southampton area. Names were collected from the diagnostic index at Southampton Eye Hospital and from the Outpatient Clinic at Lymington Hospital.

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From the hospital notes the following information about the patient was obtained: sex, date of birth, consultant, severity of visual field loss at presentation, and prescribed treatment.

Patients were included in the study if they fulfilled all the following conditions: (a) They had been diagnosed as having chronic open-angle glaucoma, by a consultant ophthalmologist between May 1977 and April 1980 inclusive. (b) They lived in the Southampton and South-west Hampshire Health District and had not been referred from elsewhere after diagnosis. (c) They had an intraocular pressure of 21 mmHg or more measured by Goldmann applanation tonometry, glaucomatous cupping of the optic disc, and a glaucomatous visual field loss, in one or both eyes at the time of diagnosis. (d) There was no evidence of angle closure. (e) They had been prescribed medication for glaucoma. (f) No condition, such as senile dementia, was present which rendered them unsuitable for interview.

One hundred and seventy-four patients fulfilled the above criteria. Six preferred not to take part in the study (all of these were regular attenders at the Outpatient Clinic). The remaining 168 patients were then interviewed, all by the same research worker (J.M.M.), in their homes, by means of a structured questionnaire.

It was first ascertained whether or not the patient knew the name of his eye condition. If he knew that he suffered from glaucoma, questions were asked about his knowledge of the disease—whether he had heard of it before being diagnosed and how much he knew about it now. All patients were asked if they knew what would happen if they had no treatment.

They were asked what medication they had been prescribed and whether they were having any other drugs for another condition.

An attempt was made to estimate the number of missed doses by the comment and question, 'Everyone forgets to take their pills and to use their drops sometimes. How many times, on average, during the week do you miss yours?' If he admitted missing doses he was asked why he thought that this happened and at which times of day he was most likely to forget. Inquiries were made as to side effects, difficulties in instilling drops, and where the drugs were obtained. Details were sought of education, social class, and living companions.

It was felt that different degrees of compliance might show different causal factors. It was decided therefore to divide the patients into 5 groups as follows:

Group I: Patients who claimed that they used their medication as prescribed.

Group II: Patients who said that they missed an occasional dose per week.

Group III: Patients who missed more than the above but apparently used at least half of the medication prescribed.

Group IV: Patients who used some, but less than half of the medication prescribed.

Group V: Patients who did not use any of the prescribed medication.

Results

Eight-five men (average age 70.1, 39–88) and 83 women (average age 73.7, range 50–89) were interviewed. Thirty-one of the patients had had surgery, 26 on one eye and 5 on both. Various combinations of a beta blocker, pilocarpine, adrenaline, guanethedine plus adrenaline, and acetazolamide had been prescribed. There was no significant differences in the medication prescribed by the 5 consultants involved. Patients used medication 2, 3, or 4 times a day, with a total number of doses ranging from 2 to 8 per day. Six patients who had been prescribed a beta blocker were found on interview to be having medication for asthma—a contraindication. One patient exceeded the prescribed medication by 50%, because she felt that it was doing her so much good. This patient was not included in the following considerations.

The numbers of patients in the different compliance groups are shown in Table 1. Twelve patients had stopped attending the Outpatient Clinic for periods ranging from 6 months to 3 years. Of these, 4 patients had understood that they were better and did not need a further follow-up appointment, 5 had been ill at the time of their last appointment and had not made another, 1 was on night work, and 2 said that

Table 1 Numbers of patients in different compliance groups

	Compliance groups					Total
	I	II	III	IV	V	
Patients attending outpatient clinic regularly	97	36	20	2	1	156
Patients not attending outpatient clinic regularly	1	0	0	2	9	12
Total	98	36	20	4	10	168

they felt that the treatment was not doing them any good. Three of the 12 patients who were not attending the clinic was getting repeat prescriptions from their general practitioners. The other 9 were having no treatment.

FACTORS AFFECTING COMPLIANCE

Seventy patients admitted missing at least some of their prescribed medication. The main reason for defaulting given by the 61 patients who either attended the clinic or had medication prescribed by their general practitioners are shown in Table 2. The most frequently given reason was forgetfulness. Two elderly patients who were poor compliers (group IV) were very worried by their forgetfulness. One lived in an old people's home and did not like to ask for help for fear of being thought a nuisance. The other, who lived on her own, was very confused by her complicated regimen and anxious because she had been told that she would go blind if she did not use her drops correctly. Three patients who could not remember what they had been told at the clinic said that they could not see well enough to read the instructions on the bottles or the colours of the tops. Inconvenience was cited by 24 of the patients mainly because they were out of their houses at work, shopping, or visiting. Two patients (one on pilocarpine and the other on adrenaline) were inconvenienced at work because of blurred vision and tended not to use the drops when they had to do fine work. Four patients found actual physical difficulty in instilling the drops. Two of these had parkinsonism,

Table 2 Main reasons given for defaulting

Reason	Compliance group				Total
	II	III	IV	V	
Forgetfulness	32	16	1	0	49
Inconvenience	17	7	0	0	24
Did not consider it important	0	5	2	1	8
Misunderstanding	1	3	2	1	7
Difficulty	0	6	1	0	7
Discomfort	2	1	0	0	3

Thirty-seven patients gave 2 reasons.

Table 3 *The number of times per day for which medication was prescribed in the different compliance groups*

	Compliance groups					Total
	I	II	III	IV	V	
Prescribed b.d.	60	9	9	0	2	80
Prescribed t.d.s. or q.d.s.	38	27	11	4	8	88
Total	98	36	20	4	10	168

$\chi^2=21.41$, 4 DF, $p<0.001$ when comparing all 5 groups.

$\chi^2=16.17$, 1 DF, $p<0.001$ (with Yates's correction) when comparing group I with the other groups combined.

one had only one seeing eye, and the other suffered from right sided hemiplegia. Three patients sometimes failed to use their drops because they caused discomfort. On the other hand 4 patients liked the discomfort, because they said they could feel it doing some good. One patient, having been changed from pilocarpine to a beta blocker, failed completely to use this because, he said, 'It did not do anything for my eyes, not nearly as good as the other sort, I could really feel that.' One reason for using less medication than prescribed, given by 4 patients living in rural areas, was difficulty in getting to the chemist. Many of those who said that they used all their doses correctly described some system that they had devised in order to help them remember the prescribed routine.

Table 3 shows the compliance of the patients who were prescribed medication to be used twice daily compared with that of patients who were prescribed medication to be used 3 times a day or more. The former group is significantly more compliant. The 2 groups were similar in age, knowledge of their condition, social class, and education, all factors which might influence compliance. The number and type of drugs prescribed also appeared to affect compliance, but when the number of times per day was taken into account these relationships were found to be not significant.

Out of the 42 patients who missed some, but not all, of their medication that had been prescribed t.d.s. or q.d.s. 30 (71.4%) said that they were more likely to miss doses in the middle of the day than at any other time. Two patients were more likely to forget in the morning and 2 in the evening. Eight patients said that it varied. Out of the equivalent group of 18 patients who had been prescribed medication to be used twice a day 15 (83%) found that the evening dose was the one most likely to be missed. One patient forgot the morning dose and 2 patients said that the morning or evening were equally likely to be missed.

All 168 patients had been told the diagnosis by the consultant, and the importance of carrying out the treatment as prescribed had been emphasised. However, when interviewed 50 patients said that they

Table 4 *Numbers of patients who knew the name of their eye condition in the different compliance groups*

	Compliance group					Total
	I	II	III	IV	V	
Patients who knew they had glaucoma	72	31	11	2	2	118
Patients who did not know they had glaucoma	26	5	9	2	8	50
Total	98	36	20	4	10	168

$\chi^2=19.90$, 4 DF, $p<0.001$, when comparing all 5 groups.

$\chi^2=12.39$, 1 DF, $p<0.001$ (with Yates's correction) when comparing groups I and II with the other groups.

did not know what was wrong with their eyes. When patients were asked if they knew what would happen if they had no treatment, 52 said that they did not know and 10 said that nothing would happen. Patients who knew the name of their eye disease or who knew the possible effect of no treatment were significantly more likely to comply with instructions (Tables 4 and 5). For both factors the variation was caused by the larger proportion of patients in compliance groups I and II who had these items of knowledge than patients in compliance groups III, IV, and V. Patients who knew their diagnosis were younger (average age 70.7 years) than those who did not know (average age 74.1 years). The difference was statistically significant ($t=2.23$, $p<0.05$). They were also better educated, with 38% having education beyond the official school leaving age compared with 20% of those who did not know their diagnosis ($\chi^2=4.45$, $p<0.025$), and of a higher social class with 40.7% in social classes I and II compared with 14% of those who did not know that they had glaucoma ($\chi^2=10.17$, $p<0.005$). Similar significant results were found for age and social class when patients who knew the importance of treatment were compared with those who did not, but the result for education was not significant. Two other factors

Table 5 *Numbers of patients who knew the possible result of no treatment in the different compliance groups*

	Compliance groups					Total
	I	II	III	IV	V	
Patients who said either that they would go blind (95), or that they would get worse (11)	63	29	11	1	2	106
Patients who did not know (52) or said that nothing would happen (10)	35	7	9	3	8	62
Total	98	36	20	4	10	168

$\chi^2=15.80$, 4 DF, $p<0.005$, when comparing all 5 groups.

$\chi^2=7.65$, 1 DF, $p<0.01$ (with Yates's correction) when comparing groups I and II with the other groups.

which affected the knowledge of the patients (and therefore their compliance) were whether or not the patient had had surgery and to which consultant the patient was assigned.

Twenty-two patients had been given a booklet on glaucoma, and without exception they said that they had found it helpful. These patients were all good compliers (groups I or II). The other patients were asked if they would like to have a booklet and 82% of them said that they would.

FACTORS THAT DID NOT APPEAR TO AFFECT COMPLIANCE

The following further factors were considered, and none of them showed any statistically significant effect on compliance: sex, severity of visual field loss, length of time since diagnosis, knowledge of the disease mechanism, prediagnostic knowledge of the disease, living companions, ability to instill their own drops, same medication prescribed for both eyes, and whether or not medication had been prescribed for another condition.

Discussion

The previously reported prevalence of noncompliance among glaucoma patients ranges from 27%³ to 58%.⁴ Different study designs and definitions of compliance probably account for this variation. The figure of 42% found in this study for patients who miss at least some of their medication is probably an underestimate. The technique of interviewing patients in order to gain an estimate of their compliance is liable to the error of underreporting. In order to improve compliance it is important to find out why patients miss doses.

Forgetfulness, the main reason given by patients who missed one or 2 doses a week, is difficult to overcome, although suggestions of some sort of method to aid memory might be helpful. Doses prescribed to be used in the middle of the day were more likely to be missed than ones in the morning or evening. This agrees with a recently published report from Sweden.⁸ Consequently, patients who are on a regimen involving twice daily medication (morning and evening only) are likely to comply better than those on a regimen involving medication 3 or 4 times daily (morning, during the day, and in the evening). It has been shown⁵ that patients using drugs once a day are more likely to comply than those using them twice daily.

More serious cases of noncompliance were likely to have been caused by lack of knowledge (especially of

the name of the disease and the importance of treatment) and misunderstanding of instructions. The association between compliance and knowledge of the name of the disease has been previously noted.² It is recognised that patients will forget instructions, especially if a great deal is presented at one time.⁹ The occasion on which the glaucoma is diagnosed at the outpatient clinic is likely to be a tiring and a lengthy experience for the patient and is perhaps not the ideal time to impart such important information.

Twelve patients in this study said that they knew that they had been told about their condition at their first visit but had not been able to take it in for various reasons, which included shock, tiredness, deafness, worry about waiting relatives, and worry that their parking meter had run out. A booklet, given to patients who would like it, allows them to digest information at their own pace and to refer to it later if necessary. There were many patients who were anxious about their condition and wanted information but did not feel that they could bother the doctors at the clinic.

In short, the following 3 measures would probably improve compliance: (1) to simplify the regimen so far as possible; (2) to ensure that the patient is aware that he has glaucoma and that he knows the importance of carrying out the prescribed treatment; and (3) to ensure that the patient understands the instructions given and that he is capable of carrying them out.

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