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## ABSTRACT

**Background:** The aim of this study was to determine the rate of compliance to medical therapy of primary open angle glaucoma in Enugu with a view to improving patient care and reducing visual deterioration and loss from glaucoma.

**Method:** One hundred and five patients were reviewed from the glaucoma patients who came to the clinic for follow up. They were all examined to make sure that they met the inclusion criteria, and then a standard questionnaire was filled for each patient from information obtained by direct questioning and also from the case records. A 2 by 2 table approach was used to explore the relationship between the variables. Both Z test and Chi-squared test and the associated P value were used as the basis for approximate tests of significance.

**Results:** The study shows that poor compliance to medical therapy occurred in 42.2% of the patients, mostly those in the older age groups and those who had no knowledge of the nature of the disease and its treatment. Other factors leading to poor compliance were poor understanding of the doctor's instructions on how to use the drugs, high drug cost, non-availability of drugs and side effects of medication. Single drug therapy gave a good compliance rate but even this was compromised when it was combined with other drugs especially, when they had to be administered frequently.

**Keywords:** Primary Glaucoma; Medical Therapy; Compliance.

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common<sup>3, 4</sup>. Also, the various ocular and systemic side effects of the anti-glaucoma drugs may affect patients' compliance. Patients sometimes assume that a side effect of their drug implies a worsening of the ocular condition which may affect the compliance in addition to other factors such as poor motivation, forgetfulness and inability to buy drugs. Besides all this, treatment offers no subjective improvement to the patients and to the utter dismay of the ophthalmologist, visual deterioration continues in some patients in spite of apparently good control of intraocular pressure.

The compliance with treatment is known to influence disease outcome. It is on this background that this study was done to determine the rate of compliance to medical therapy of patients with primary open angle glaucoma in Enugu. It is expected that the identification of factors affecting treatment compliance, will provide a basis for intervention to achieve improved outcomes in medical glaucoma therapy, resulting in reduction in visual deterioration and loss from glaucoma.

## MATERIALS AND METHOD.

This study was carried out at the eye clinic of the University of Nigeria Teaching Hospital, Enugu, where the ethical clearance was obtained. One hundred and five consecutive patients with primary open angle glaucoma coming for follow-up in the clinic within a six month period (May to October, 1991) were selected. Only adult patients who had been on treatment for at least six month were included.

All the patients seen had previously been diagnosed as having primary open angle glaucoma. They were further examined to ascertain that they met the study criteria which were; an intraocular pressure of 21 mm Hg or above on two or more clinic attendances; pale and cupped glaucomatous discs with some loss of the visual field and the absence of other features that could account for the raised intraocular pressure.

A prepared questionnaire was filled for all the primary glaucoma patients to record information such as sex, occupation, education / socio-economic status, family history, drugs prescribed, frequency of administration, reasons for non-compliance if any, availability and cost of drugs, side effects of drugs, distance of the patients residence from the hospital and history of ocular surgery. Data collected from the case notes include age at presentation, duration of symptoms if any, intraocular pressure, visual acuity, visual field results and the name of drugs prescribed.

## INTRODUCTION

Glaucoma is a group of clinical disorders that are characterized by optic nerve damage and visual field defects. The intraocular pressure levels may exceed the tolerance of the affected eye<sup>1</sup>. The level of intraocular pressure that causes organic change is not definable since it varies widely from one eye to the other<sup>2</sup> and some eyes may tolerate for long periods a pressure that would rapidly blind another. The management of primary glaucoma is beset by an appreciable number of problems that do not arise in the treatment of any other disorder in ophthalmology.

Firstly, because of the painless and gradual nature of the visual deterioration, late presentation to the hospital is

Routinely, every patient had his or her visual acuity, intraocular pressure by applanation and detailed funduscopy done by the authors at each clinic attendance. The visual field is usually checked once in every six months for each patient with the Friedman's visual field analyzer.

All information collected on each individual was analyzed. The 'z' and the Chi Square tests were used to determine the relationship between the variables while the 'P' value was used to provide the basis for approximate tests of significance.

**Table 1: Treatment Of 208 Eyes In 105 Patients With Primary Glaucoma**

Type of Therapy	Number of Patients	Number of Eyes
Medical Therapy	64	157
Surgery	41	51
Total	105	208

**Table 2: Out-Come Of Medical Therapy In 157 Eyes Of 105 Primary Glaucoma Patients.**

	Number of Eyes (%)
1. Medication has controlled	62 (43.9)
2. Medication has not controlled intraocular pressure	95 (56.1)
Total	157 (100)

**Table 3: Percentage Compliance To Medical Therapy In 95 Primary Glaucoma Patients.**

Drugs Prescribed	No. of Patients on the Drug(s)	No. of Patients not Complying	No. of Patients Complying	% Compliance
1. Diamox	1	-	1	100
2. Pilocarpine	1	1	-	0
3. Timoptol	30	3	27	90
4. Diamox + pilocarpine	1	1	-	0
5. Diamox + Timoptol	17	7	10	58.8
6. Pilocarpine + Timoptol	32	14	18	56.2
7. Diamox, Pilocarpine + Timoptol	13	5	8	61.5
Total	95	55	40	

CHI SQU = 6.66 CV = 5.99 P>0.05 (Statistically significant)

**Table 4: Reasons Given By Patients For Non-Compliance To Medical Therapy.**

Reasons for NonCompliance	No. of Patients	% Compliance
1. Did not understand the doctors instruction clearly	18	40.9
2. Drug got finished	8	18.8
3. Side effects of drugs	5	11
4. Drug needs to be used too frequently so patient sometimes forget to use the drug	4	9.1
5. Cannot afford the cost of drugs regularly or at all	4	9.1
6. Was given a wrong instruction by the nurse	1	2.2
7. Could not get drug to buy	1	2.2
8. Did not see any need to buy the drug	1	2.2
9. Other eg, lost prescription was bereaved, etc.	2	4.5
Total	44	100

**Table 5: The Effect Of Number Of Drugs In Use On Compliance**

Number of drugs prescribed	Compliers	Non-compliers
None	-	4
One	27	4
Two	19	26
Three	7	11
Total	43	45

**Table 6: Age And Sex Distribution Of 105 Primary Open Angle Glaucoma Patients Seen In The Eye Clinic, Unth**

Age in Years	No. of Patients Male	Female	Total	%
10 19	1	1	2	1.9
20 29	4	2	6	5.7
30 39	10	3	13	12.3
40 49	13	15	18	17.1
50 59	14	13	27	25.9
60 69	20	11	31	29.5
70 79	5	3	8	7.6
Total	67	38	105	100

X<sup>2</sup> = 2.649 df = 3 P>0.05 (Not significant)

**Table 7: Educational background of 105 primary open angle glaucoma patients.**

EducationalBackground	Frequency	%
No formal education	20	19
Primary education	40	38
Secondary education	35	33
Post-secondary education	10	9.5
Total	105	100

**Table 8: Socio economic status of 105 primary open angle glaucoma patients.**

SocioEconomicStatus	Frequency	%
I Upper	6	5.9
II Middle	22	21.5
III Low	29	28.4
IV Very Low	44	43.1
V Unemployed	4	3.8
Total	105	100

**RESULT**

Table 1 shows the mode of therapy employed in the treatment of 105 primary open angle glaucoma patients. Though 73% of the patients claimed to be satisfied with anti-glaucoma therapy, only 39% of the eyes on medical therapy had their intraocular pressure controlled, compared to 64.6% of the surgically treated eyes. Failure of medical therapy was the commonest indication for surgery in this series.

Table 2 shows the result of medical therapy in 157 eyes treated medically for primary glaucoma. 8 patients in this group had refused surgery. On the whole, 57.8% of the patients were found to be good compliers though only 46.6% of respondents knew the consequence of not complying with medical therapy. Timoptol had the highest compliance rate of 90% which dropped to 56.2% when it was combined with pilocarpine (Table 3).

The commonest reasons given for non-compliance were poor appreciation of the doctor's instruction on how to use the drugs (40.9%), drugs got finished (20%) revealing ignorance about the nature of the disease and side effect of drugs (11.3%) as shown in table 4.

Burning, itching and smarting sensation secondary to pilocarpine institution was almost universal, occurring in 87.5% of the 24 patients on it. Other relatively common side effects were difficult night vision (8.3% of patients) and eye-ache / brow-ache (4.16% of patients). As shown in Table 4.

Multiple drug therapy and frequency of drug use was shown to reduce compliance (table 5). Of 24 patients placed on pilocarpine drops Qid, only 4 patients (16.6%) were using it as prescribed. Among the other twenty patients, 2 were not using it at all, 2 were using it daily, 7 were using it b.d, and 7 were using it t.d.s. only one patient for whom it was prescribed b.d was using it t.d.s. Whether or not the patient is on treatment for another medical condition was not significant and 27.1% of non-compliers were found to be on treatment for another medical problem.

Table 6 shows the age and sex distribution of 105 open angle glaucoma patients. The peak age prevalence is 60-69 years and the mean age of the patients is 52.4 years + 25D (where standard deviation = 14 years). The male to female ratio is 67:30 = 1.7:1)

About 20% of the patients in this series were aged between 10 39 years and 71.5% of them were from the low to very low occupational groups (III and IV) which consist of farmers, mechanics, welders, drivers, junior staff, petty traders, messengers, night-watchmen and clerks. How did age and sex affect compliance?

Table 7 shows the educational background of 105 primary open angle glaucoma patients. 19% of the patients had no basic education. How did educational background affect compliance? -

Table 8 shows the socio-economic status of 105 primary open angle glaucoma patients. 5.9% were in the upper socio-economic cadre and 71.5% were in the low to very low socio-economic group. There seems to be some association between the educational background and the socio-economic status not acceptable? What is the association please state it precisely? How did the socio-economic status affect compliance?

## DISCUSSION

The drugs used for medical therapy of primary open angle glaucoma in this study were pilocarpine, timoptol and diamox. The choice of drug(s), dosage used and frequency of application were determined by the level of the intraocular pressure at presentation and during subsequent visits. Treatment of glaucoma is aimed at reducing intraocular pressure to a level at which no further progression of cupping or visual field defects occur. Prior research<sup>5,9</sup> has repeatedly demonstrated that visual field analysis is a more consistent monitor of glaucoma than is intraocular pressure, as some cases with apparently good control of intraocular pressure continue to lose field. Failure of medical therapy was the most common indication for surgery in this series. This failure was due to various reasons and poor motivation which also leads to poor compliance. In the absence of a medication monitor implanted into the eye drop container we can never really be sure that our patients are actually using their drops as prescribed.

The compliance rate in this study was 57.8% which agrees with studies by Campbell<sup>10</sup>, Detry-Morel<sup>11</sup> and 36.8% reported by Eni-Olorunda<sup>12</sup> in Ibadan. Rather than ask why patients do not follow directions, we should be asking "what factors make the patients do what they feel is convenient for them even when these offer no apparent improvement to them"<sup>13</sup>. This will help

identify the patients challenges in the medical treatment of...

Firstly there is little or no pain or disability in the early stages. In conditions where these are present, they serve as strong reminders to the patient of his illness and provide strong motivation to follow treatment. The symptom-free condition of early glaucoma does not provide the motivation for life-long care. The treatment is aimed at preventing long-range damage by a lowering of the ocular tension, and does not provide any subjective improvement to prove its benefit. On the contrary, the treatment may produce temporary symptoms of visual blur or darkening where there had previously been no symptoms and it is often adequate motivation for the patient to stop the therapy. The four ways in which patients can default with therapy are: failure to take medication, excessive use of medication, incorrect time spacing between doses and use of medication for the wrong purpose<sup>14</sup>. Behavioral testing, does not predict non-compliance accurately enough to allow prophylactic intervention with prospective defaulters. Also, doctors are usually very poor at guessing which of their patients are compliant and which are not.

In this series, core knowledge such as an understanding of the nature of the disease, an appreciation that blindness is inevitable in the natural history of glaucoma and a simple treatment regimen were found to improve compliance (tables 3 & 4). Timoptol eye drops, when able to control the intraocular pressure alone, had the highest compliance rate. High cost of drugs was noted as a factor deterring compliance; as many as 63.8% of the patients estimated that they were spending much more than a quarter of their salary annually on anti-glaucoma drugs. Compliance was not influenced by whether or not the patient was on treatment for another medical problem. This is in contrast to the finding of Bour et al<sup>3</sup> who found improved compliance in patients who were on treatment for another chronic illness.

About 98% of the patients were more than 20 years old and expected to understand seriousness of the disease and the consequence of non-compliance to medical therapy yet the study showed poor compliance. This may be attributed to their low level of education as 57% had either only primary or no formal education at all. Poverty may also be a factor in non-compliance as 75.3% were of low socio-economic status or below.[You cannot speculate as you did not relate these factors to compliance]

## CONCLUSION

On the whole, only 57.8% of the patients were found to be good compliers, with timolol having the highest compliance rate of 90%, which dropped to 56.2% when it was combined with pilocarpine.

High cost, frequency of use of drugs and multiple drug therapy were found to reduce compliance. The introduction of combination drugs like Cusopt may have a positive influence on drug compliance but high cost continues to be a major deterrent to the use of the prostaglandin inhibitors and these combination drugs in many of our patients.

The following recommendations will help the management of glaucoma and compliance:

The immediate establishment of a separate "Glaucoma

Clinic” in tertiary hospitals in this area as is already the case in many other centers of excellence, as these patients do not get enough attention in a crowded general clinic. A clinic specifically for glaucoma patients provides the opportunity for detailed assessment, avoiding silent deterioration and irreversible loss of vision. Most cases with stable visual fields and good intraocular pressure control should be seen once in every six months, unlike the problems cases. The patient review charts used in the Tennen Institute compiled by professor W.S. Foulds while working at Cambridge University should be used.

Ophthalmologists should spend more time with the patients on medical therapy and repeatedly explain, among other things, the nature and natural history of the disease, the importance of treatment and exactly how they should use their drugs.

Government should provide free or high subsidized drugs for those of them that cannot afford to buy their drugs or pay for filtration surgery, improve education and alleviate poverty in our society.

The training of more eye care workers in every category should be encouraged to meet the ever-increasing demands that go with increasing public awareness.

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