Indian Journal of Public Health Research & Development
Volume 13 | Issue 4 | October-December 2022

A Study on Adherence of Anti-Glaucoma Medications in Adults – An Observational Hospital based Study

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How to cite this article: Ranjita Santra, Nabanita Barua, Jayanta Dutta, Pramit Ghosh et al A Study on Adherence of Anti-Glaucoma Medications in Adults – An Observational Hospital based Study. Volume 13 | Issue 4 | October-December 2022

Abstract

Introduction: Glaucoma is chronic progressive optic neuropathy which causes irreversible visual filed loss. Antiglaucoma medication is the mainstay of treatment due to recent advances in the field. Due to increased life expectancy and availability of newer investigation technology for early diagnosis of glaucoma, duration of treatment is long. Strict adherence is required to prevent progression.

Aim: We aim to assess factors affecting adherence in a tertiary care setting.

Materials and Methods: 40 diagnosed cases of glaucoma, who were using on medication at least for 6 months, were enrolled in the study after proper consent. All patients were asked about nature of drug intake based on standardized questionnaire. Data were analysed using epi-info7 software.

Results: 40% study population were non adherent; it was comparable in males and females (p=.5). The factors like age, sex, number of drugs didn't show statistically significant association. Only parameter with significant association is higher educational level (p=0.004).

Conclusion: Drug adherence is a complex process; various factors need to be considered before prescribing medication. In case of chronic, progressive, blinding disease like glaucoma, educating patient about need to strict drug dosing, possible side effects, cost-effectivity and regular follow up is required.

Keywords: drug adherence and compliance, antiglaucoma medication, predictors of adherence

Introduction

Glaucoma is defined as a groups of multifactorial ocular neurodegenerative disease, aetiology united by a clinically characteristics optic neuropathy with potentially progressive changes at optic nerve head, thinning of neuro-retinal rim with enlargement of optic cup, corresponding pattern visual field defect, may not be detected in perimetry in early stage; while visual acuity may be spared initially, progression may lead to lead to complete visual loss, the constellation of features is diagnostic.[1] It is estimated that over 60 million people are affected, 8.4 of these population are blind. The global incidence is projected to be 111.8 million by 2040.[2] In India, it contributes to 0.6 million disability-adjusted life years (DALYs) or 1.96% of the overall burden of diseases.[3]

Adherence has been defined as "the extent to which a person's behaviour, taking medication,

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following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider."[4] Compliance is defined as "the extent to which the patient's behaviour matches the prescriber's recommendations". [5] Magnitude of non-compliance of AGM is high ranging from 20-75%. [6]

Average literacy rate of Purulia in 2011 were 64.48% against the national average of 77.7%. There is no study done to assess adherence in this population to our knowledge. Primary objective is to assess adherence pattern of AGM by interviewer's method in glaucoma patients of district in literate population and secondary objective is to identify any correlation between factors and adherence.

Materials and Methods

Study was conducted on all patients with primary and secondary glaucoma attending the department of Ophthalmology at Deben Mahata Government Medical College, Purulia over the period of six months. A total of 40 patients were included in the study who underwent ocular examination with primary investigations and structured interview. The study was conducted after institutional ethics committee (IEC) for review and approval. It was cross sectional observational, single centre, hospital-based study. At the beginning of the study, a total of 40 consecutive adult patients of both the sexes, who have been diagnosed with glaucoma and fulfilling the selection criteria will be recruited for this study. It is a single day cross sectional study.

Inclusion Criteria

1. Diagnosed and confirmed cases of Primary or Secondary Glaucoma in either or both the eyes who have been prescribed anti-glaucoma medications for at minimum period of 6 months and attending Ophthalmology OPD
2. Age limit: 21 to 65 years
3. Voluntary participation

Exclusion Criteria

1. Prior surgical intervention
2. Patients with diagnosed demetia
3. Patients who were seriously ill and unable to comprehend the study questionnaire (current acute complications of any disease)
1. Those who had a disturbance of consciousness (Glasgow coma score lower than 15) and cognitive impairment
2. Patients with mental illness

All patients had been enquired about history, detailed eye examination and their relevant findings with structured interview. Informed consent will be obtained for those screened patients willing to participate in this study. Ophthalmological parameters to be studied are routine eye examination, visual acuity with illuminated Snellen's chart, applanation tonometry, direct ophthalmoscopy, fundus examination, perimetry.

Only the diagnosed cases of glaucoma who were on antiglaucoma medications for at least 6 months were included in study. Treatment naïve patients or who failed to show previous prescriptions were excluded from the study.

Study Technique

Adult patients with primary and secondary glaucoma were enrolled in the study. Complete ocular examination as per proforma and relevant structured interview with the help of the following questionnaires will be done for every patient who will participate in this study:

General Medication Adherence Scale

The scale has 11 questions with 4 possible answers. It has three components. Component 1 is adherence pattern based on the behaviour of patient (question 1-5). Component 2 measures adherence of patient based on their comorbidity and number of pills or pill burden (question 6-9). Third component focuses or assesses adherence pattern depending on cost (question 10-11). Each item further carries individual score ranging from 0 to 3. Answer option 1 (always), 2(mostly), 3 (sometimes), 4 (never) is given score of 0, 1, 2,3 respectively. Maximum score is 33. Summation of individual items will provide adherence score of each patient. Cumulative adherence score is classified as high (30-33), good (27-29), partial (17-26), low (11-16) and poor (<10). This scoring methodology have been previously defined by Naqvi and colleagues.[7,8] For statistical analysis we have grouped patients in 2 groups. Group 1 has patients with high and good adherence (score $\geq$27), they are termed as adherent. Group 2 is termed as non-adherent, has patients with partial, low and poor adherence (< 27).

We have taken educational qualification, number of drugs and classification of glaucoma

into consideration for each patient. Educational qualification of the patients was divided into 3 standards. Basic or primary (class1-5), intermediate (class 5-8) or higher (Class 8 onwards). Number of drugs 1 or more were noted.

All the data were recorded and calculated using epi-info7 software. [Epi Info™ 7.2.4.0; Division of Health Informatics & Surveillance (DHIS), Centre for Surveillance, Epidemiology & Laboratory Services (CSELS) Centre for Disease Control & Prevention. USA]. For statistical significance of this study, p value is <0.05.

Results

We had total of 40 patients, 24 male and 16 female patients. Group 1 or adherent group (good adherence and more) had 24 patients; group 2/ non-adherent group has 16 patients. The average adherence score of the study is 60%. (Table 1, image 1).

Age of the patients ranged from 36 to 76years. Average age was 56.8(± 10.2) years and median 58years. 16 subjects were more than 60years old.

In our study, 11 out of 16 (31.2%) female patients were adherent whereas 13 out of 24 (45.8%) male patients were adherent. The difference was however, not statistically significant p=0.512 (>0.05) (Table 1).

We had classified into three subgroups; mild, moderate and severe glaucoma depending on visual field loss (mean deviation or MD values) (table 2). Mild glaucoma is a visual field defect corresponding to a mean deviation (MD) of −6 dB or better, moderate disease is a disease with MD between −6 and −12 dB, and severe disease is a disease with MD of −12 dB or worse.[21] For each patient, we determined POAG severity for the worse eye (the more negative MD), the better eye (the more positive MD). We had 12 patients with mild, 12 moderate and 16 with severe glaucoma. Mean MD value of group 1/ adherent is -7.4 with mean age of 53.75 years. Mean MD value of patients with adherence value of group 2/ non-adherent is -9.4 with age of 58.8 years. Patients with younger age and less severe disease seem to have better compliance. The difference is not significant, p values are .42 and .12 for MD and age respectively (>0.05) (Table 3).

In our study, 22 patients were put on single drug, 11 patients on two drugs and 7 patients on 3 drugs (table 4). In this study there was no difference between single and multiple drugs (p-vale=0.53, >0.05). It appears that with multiple drugs adherence is poor but it is not statistically significant. A study with larger population can show statistically significant result.

In our study, 11 patients with basic education had score of less than 27; 2 patients with intermediate education and 11 patients with higher education had score of more 27 (image 2). This difference was statistically significant. Comparing basic and others, p-value=0.004, while all those with basic education had poor adherence, 56% among those with better education had better adherence. Higher education level of patients is critical for better adherence.

Discussion

Adherence is an active process, where appropriate treatment is decided after a proper and detailed interaction with patient. The said patient is under no compulsion to accept that particular treatment, thereby not to be held solely responsible for non-adherence.[9]

Compliance, on the other hand, is a passive process, it focusses on medication-taking behaviour. It may be problematic for the patients as it narrates a process where autonomy of the patient is not considered. This may hamper therapeutic benefits as it doesn't take into account patient's general awareness of the disease, socio-demographic background, efficacy, tolerability and adverse effects of medications, need to follow up, or lack of insight due to psychosocial abnormalities, abnormal mood states like depression, or personality traits etc.[10]

In our study overall non-adherence is 40%. It is similar to study done is Southern India, where it was 53.6%.[11]. In other studies, non-adherence ranged from 20 to 75 %, though the evaluation methods were not standardized. [6]

In our study, male adherence was better 45.8% as compared to 31.2% in females, difference is not statistically significant. It is comparable to study in Egypt where though females showed higher tendency for adherence, after multivariate analysis difference was not significant. [11]

In our study, patients with younger age and less severe disease seem to have better adherence, though not statistically significant. Adherence in older patients may be less due to lot of other factors such as lack of family support or appointed care giver, decreased vision, lack of dexterity, coordination,

comprehension, or memory.[12] These factors are; however, this was not included in the questionnaire.

It appears that with multiple drugs adherence is poor as compared to single drug. This agrees with previous studies.[11,12] Though our study only showed a tendency but it is not statistically significant. A study with larger population can show statistically significant result.

In Our study, all patients with basic education were non-adherent. 56% of patients with better education were adherent to medication. Difference of adherence on the basis of educational qualification were significant (p=0.004). Educated patients tend to be more information, knowledge about glaucoma, thereby increasing more aware the disease and need to adhere to treatment regime. It is also found increasing knowledge and awareness about the disease increases adherence.[11-13]

Our findings also corroborated with Egypt base study where gender, dose related problems, medication side effects, and systemic comorbidity did not have a significant association with adherence; strong association is found with better education, awareness about the disease.[11,12]

Conclusion

Adherence to ocular hypotensive medications is a critical part of secondary prevention of visual impairment from glaucoma. Regardless of the definition, glaucoma patients attain the full benefits of AGM only when they use them every day. Although there are studies in the literature pertaining to adherence and outcome of medical management of glaucoma in different geographical locations, still there is paucity of results with subjects of low economic status. Various factors such as age, sex, severity of disease, number of pills, complexity of doses, cost effectiveness should be considered before prescribing the drugs. Patients should be made aware of slow, progressive, blinding nature of the disease and need for strict drug adherence and follow up. Active interaction with patients for reason for non-adherence, steps to improve it need to be discussed to reduce the ultimate disease burden.

Table 1: Gender distribution of sample with adherence score

Sex	Score<27	Score >27	Total
Female	11(68.8%)	5(31.2%)	16
Male	13(54.2%)	11(45.8%)	24
Total	24	16	40
p=0.512 (>0.05)			

Table 2: Classification of Glaucoma patients

MD value (worst eye)	F	M	Grand Total
MD >(-)6.00	5	7	12
MD between (-) 6 to (-)12	6	6	12
MD <(-)12	5	11	16
Grand Total	**16**	**24**	**40**

Table 3: Distribution of disease by severity of disease (degree of visual field defect) and corresponding adherence score

Score groups		Mean MD	Max MD	Score	Age(Y)
<27 Group 2/ non-adherent	Mean	-9.41	-12.42	20	58.88
	N	24	24	24	24
	Std. Deviation	7.87	9.36	4.72	8.29
	Median	-7.2	-9.85	20	58.50
	Minimum	-24.51	-27.77	11	45
	Maximum	-.32	-1.35	26	76
≥27, Group 1/ adherent	Mean	-7.49	-9.87	28.63	53.75
	N	16	16	16	16
	Std. Deviation	6.33	6.71	1.54	11.95
	Median	-6.27	-9.18	28	55
	Minimum	-24.73	-24.73	27	36
	Maximum	-.47	-1.16	32	73
Total	Mean	-8.64	-11.4	23.45	56.82
	N	40	40	40	40
	Std. Deviation	7.27	8.39	5.69	10.09
	Median	-6.48	-9.36	26	58
	Minimum	-24.73	-27.77	11	36
	Maximum	-.32	-1.16	32	76
	p-value	0.42	0.35		0.12

Table 4: Adherence score depending on number of drugs used

Number of drugs	Score <27	Score >27	Total	OR	CI (lower-upper)
1	12	10	22	1	Reference
2	6	5	11	1	0.23-4.27
3	6	1	7	0.2	0.02-1.95
	24(60)	16(40%)	40		
p-value = 0.53. between single drug and multiple drugs p value= 0.2, when compared 2 drugs vs 3 drugs.					

Conflict of interest – None

Source of Funding - Not required

13. Ethical clearance taken from institutional ethical committee

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Legends

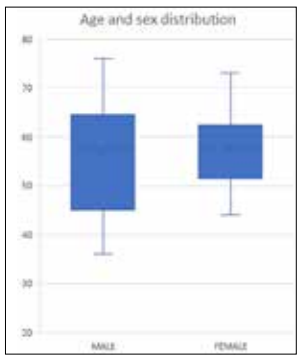

Image 1: Age and sex distribution of sample population

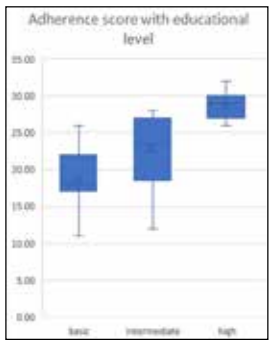

Image 2: Adherence score with different levels of education