(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 9, Issue 3, Page No: 114-119
May-June 2026

IJMSCR

# Evaluation Of Relationship Between Adherence To Anti-Glaucoma Medications And Glaucoma Progression.

**[1]Dr. Asif Amin Vakil, [2]Dr. Ashaq Hussain Bhat**
[1]Associate Professor, [2]Senior Resident,
Department of Ophthalmology, Govt Medical College, Srinagar

***Corresponding Author:**
**Dr. Ashaq Hussain Bhat**
Senior Resident,
Department of Ophthalmology, Govt Medical College, Srinagar.
drashaqdr@gmail.com

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

**Abstract**

**Introduction:** Medical therapy is the initial management modality of primary open angle glaucoma. This study aspires to assess relationship between glaucoma adherence and glaucoma progression.

**Study design:** A prospective hospital-based observational study.

**Materials and Methods:** 160 eyes of 80 patients having primary open angle glaucoma were included in this study. Clinical and investigational data including best corrected visual acuity, visual fields, disc morphology and RNFL thickness was collected at initial visit (0 month) and at 8$^{th}$ month follow up. Adherence data was collected from patients at 4 months by morisky scale questionnaires.

**Results:** 160 eyes of 80 patients having primary open angle glaucoma were included in this study. 81.1% of eyes in high adherence group had stable BCVA as opposed to 44.4% and 22.2% in medium and low adherence groups respectively, thereby suggesting a statistically significant positive impact of good adherence in preventing deterioration of BCVA. In 8 months, average change in mean deviation on visual field analysis was -2.79 dB (decibels), -2.03 dB and -1.33 dB in low, moderate and high adherence groups emphasizing a positive impact of good adherence on stability of visual fields. Mean of average RNFL thickness decreased in 8 months by 14.4 µm, 6.5 µm and 1.73 µm in low adherence, medium adherence and high adherence groups respectively. A statistically significant association was seen between adherence and decrease in RNFL thickness. **Conclusion:** Adherence to anti-glaucoma medication is a vital factor in preventing glaucoma progression.

**Keywords**: Medication adherence, Glaucoma progression , Anti-Glaucoma Medications

## Introduction

Medical therapy of glaucoma is the cornerstone of POAG (primary open angle glaucoma) management which targets the intraocular pressure by use of drugs. Major determinant for success of medical therapy is the adherence of patients to their medication. Non-adherence is one of the major problems in management of glaucoma, especially in initial stages when visual symptoms are absent or minimal. According to the literature, the rate of non-adherence in glaucoma therapy varies between 30-80%.[1] Non-adherence leads to poor clinical outcomes, increase in morbidity rates, and unnecessary healthcare expenditure. It is estimated that approximately 10% of visual field defects are caused by non-adherence.[2,3] Evidence shows that effective medical treatment of glaucoma can prevent up to 50% of blindness.[4]

**Aims And Objectives**

To determine relationship between adherence behaviour and glaucoma progression.

**Materials And Methods**

The present study was conducted from May 2025 to February 2026 in Postgraduate Department of Ophthalmology, Govt Medical College, Srinagar, Jammu and Kashmir.

**Inclusion Criteria:**

1. A diagnosis of POAG.
2. Age over 40 years.

**Exclusion Criteria:**

1. Age below 40 years.
2. Glaucoma types other than POAG.
3. Patients with media opacities obscuring disc evaluation.
4. Severe co-morbidities directly affecting compliance (e.g. mental retardation, physical disability etc)
5. Patients with past history of any ocular surgery.
6. Patients who underwent glaucoma surgery in study period.

After taking proper consent, clinical and investigational evaluation data was collected at initial visit (0 month) and at 8th month follow up.

**This Evaluation Included:-**

1. Demographic details of patients.
2. History of present and past illnesses.
3. General physical examination.
4. Systemic examination.
5. Ocular examination and investigations as under:
    a. Visual acuity at 6 metres and pinhole test using Snellen's alphabetical chart for literate and C chart for illiterate patients.
    b. Preliminary Examination in Diffuse Light with a Torch.
    c. Anterior segment examination on slit lamp biomicroscope
    d. Posterior segment examination, including optic disc assessment, was done with direct ophthalmoscopy and slit lamp biomicroscopy using 78D lens.
    e. Intraocular pressure measurement with Goldmann Applanation Tonometry.
    f. Retinoscopy.
    g. Gonioscopy with Goldmann's three mirror goniolens.
    h. Perimetery was done by Humphrey's Field Analyser using SITA Standard Algorithm.
    i. RNFL Thickness analysis on OCT (CARL ZEISS CIRRUS HD-OCT 500)

Adherence data was collected at 4th month using Morisky scale. Morisky scale is a widely used adherence evaluation scale with total eight questions/items : first seven items are Yes/No responses while the last item is a 5-point likert response.

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean±SD and categorical variables were summarized as frequencies and percentages. Graphically the data was presented by bar diagrams. Chi-square test was employed to determine the association of adherence and deterioration in BCVA. To establish the correlation of change in IOP (mmHg), CDR, MD (dB) and RNFL thickness with adherence, ANOVA was applied. A P-value of less than 0.05 was considered statistically significant. All P-values were two tailed.

**Results**

160 eyes of 80 patients having primary open angle glaucoma were included in this study. At baseline, most study eyes (56.25%) had best corrected visual acuity (BCVA) of 6/6 to 6/12 and 18.75% of eyes had BCVA <6/60. 16.9% of study eyes had relative afferent pupillary defect (RAPD) at baseline. Mean optic disc vertical C/D ratio at baseline was 0.66 ± 0.24 ranging from 0.4 to optic atrophy. 10 eyes had optic atrophy at baseline. Mean intraocular pressure (IOP) at baseline was 23.77±9.78 mmHg ranging from 18 – 50 mmHg. Average of mean deviation was -7.20±7.11 ranging from +0.86 to -21.29. Mean of average RNFL thickness was 73.4±14.38 micrometers (µm) with range from 26-98µm. OCT was not possible in 14 eyes due to fixation problems.

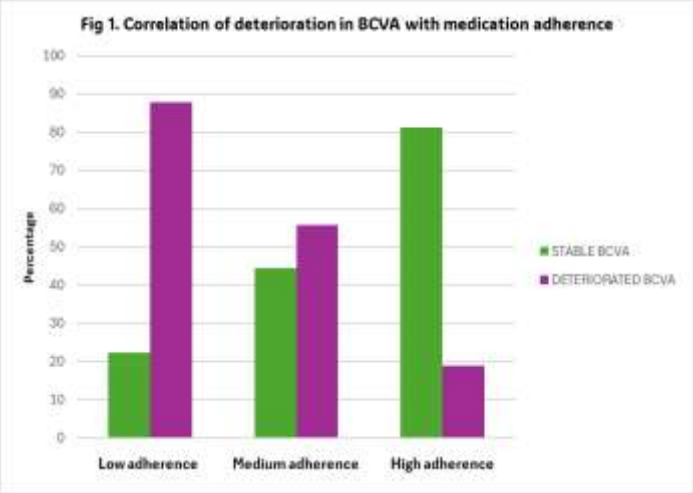
On the basis of morisky medication adherence scale-8, 11.25% of study patients had low adherence (score >2), 22.5% had medium adherence (score 1 or 2) and 66.25% had high adherence (score 0).



Volume 9, Issue 3; May-June 2026; Page No 114-119

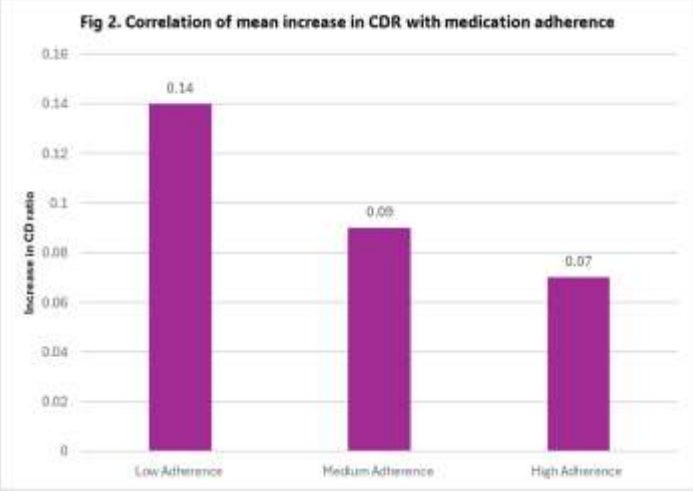
After evaluating data from study patients at baseline and 8th month follow up, mean change in various clinical and investigational parameters was calculated for 3 adherence groups.

Deterioration in BCVA was calculated for study eyes as per international classification of diseases 11 (ICD-11) categories for visual impairment. 81.1% of eyes in high adherence group had stable BCVA as opposed to 44.4% and 22.2% in medium and low adherence groups respectively ( Fig 1).

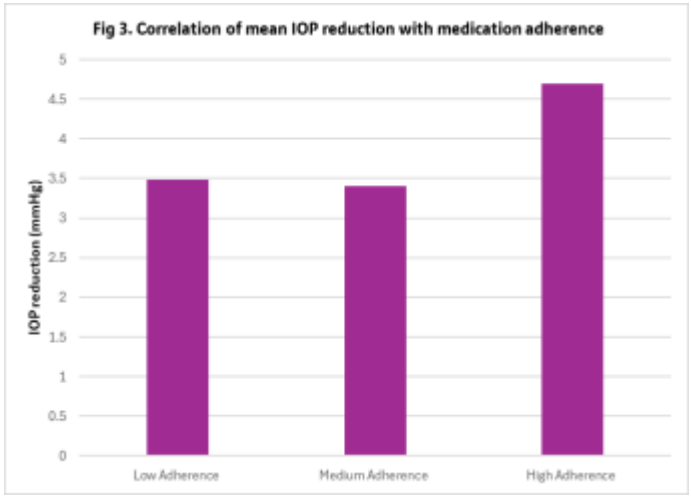



High adherence had a statistically significant positive impact in preventing deterioration of BCVA.

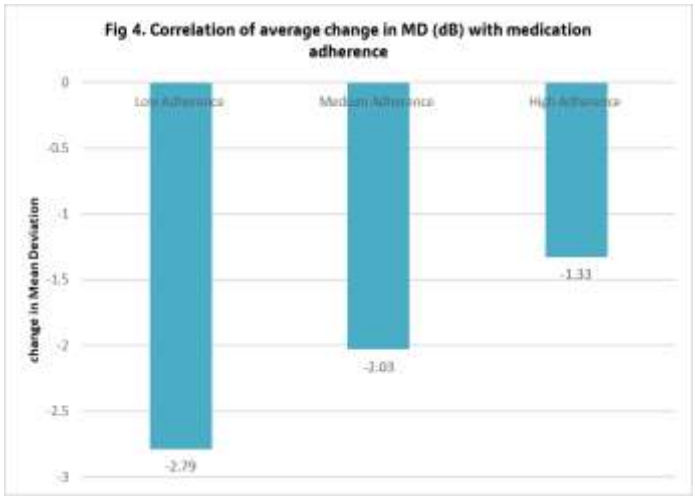
Mean increase in CDR over 8 months of follow up was 0.14, 0.09 and 0.07 in low, medium and high adherence groups respectively (Fig 2). It was statistically insignificant.




With regard to intraocular pressure, highest decrease in mean IOP was seen in high adherence patients (4.70±6.90) followed by low adherence group(3.48±6.22) and then medium adherence group (3.40±6.79) as shown in Fig 3.



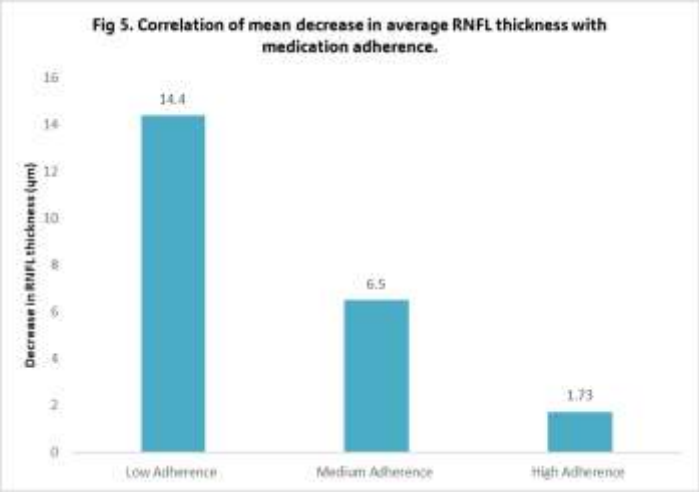

In 8 months, average change in mean deviation on visual field analysis was -2.79, -2.03 and -1.33 dB in low, medium and high adherence groups respectively (Fig 4). This shows a statistically significant positive impact of good adherence on stability of visual fields.




Mean of average RNFL thickness decreased in 8 months by 14.4 µm, 6.5 µm and 1.73 µm in low adherence, medium adherence and high adherence groups respectively (Fig 5). A statistically significant association was seen between adherence and decrease in mean RNFL thickness.



Volume 9, Issue 3; May-June 2026; Page No 114-119




## Discussion

Poor adherence to anti-glaucoma therapy is a major problem as far as management of POAG is concerned, and has been reported in 30-80% of patients.[1] Non-adherence leads to increased visual morbidity.

Ribeiro et al [5] while evaluating the quality of subjective vision among patients, observed that the group adherent reported a better visual acuity than the group non-adherent, and also a higher percentage of patients reported that the visual acuity was "bad" in non-adherent group. As per our study, a statistically significant correlation was seen between adherence and deterioration of best corrected visual acuity. 81.1% of eyes in high adherence group had stable BCVA as opposed to only 22.2% of eyes in low adherence group.

Studies comparing visual field loss with adherence have shown negative impact of poor adherence on visual fields. Non-adherence to therapeutics increases the risk of visual field loss .[6] In a study by Rossi et al. patients who were at least 90% adherent did not progress, while 43.5% of the patients with lower adherence worsened.[7] Similar results were obtained in our study. Over a period of 8 months, worsening of mean deviation in visual field analysis was highest in low adherence group.

Previous studies have found that IOP reduction had no relationship to adherence.[8,9] In our study amount of IOP reduction was not predicted by level of adherence though IOP reduction was more in high adherence group than in low or medium adherence groups. This suggests that anti-glaucoma medications might have mechanisms of action, besides lowering IOP, which prevent/retard glaucoma damage.

Lower adherence was associated with higher IOP and accelerated glaucomatous damage, including faster rates of mean deviation deterioration and increased RNFL thickness loss.[10] We also observed that change in disc CDR over the follow-up period was statistically related to level of adherence. Furthermore, a statistically strong relationship (p value <0.001) was seen with RNFL loss and adherence. These effects of adherence level on disc CDR and RNFL loss need to be validated in further studies.

## Conclusion

Low adherence is associated with a significant deterioration in BCVA, IOP, visual fields, CDR and RNFL thickness. Improving adherence behaviour in glaucoma patients should be a major consideration in glaucoma management.

## References

1. Schwartz GF, Quigley HA. Adherence and persistence with glaucoma therapy. Surv Ophthalmol. 2008;53 Suppl1:S57-68.
2. Welge-Lussen U, Weise S, Yu AL. Assessing the adherence behaviour of glaucoma patients to topical eye drops. Patient Prefer Adherence. 2015;9:17–23.
3. Konstas AG, Maskaleris G, Gratsonidis S, Sardelli C. Compliance and viewpoint of glaucoma patients in Greece. Eye (Lond). 2000 Oct;14 Pt 5():752-6.
4. Nordstrom BL, Friedman DS, Mozaffari E, Quigley HA, Walker AM. Persistence and Adherence with Topical Glaucoma Therapy.Ophthalmology. October 2005;140(4),598e1-10.
5. Ribeiro MVMR, Ribeiro LEF, Ribeiro ÊAN, Ferreira CV, Barbosa FT. Adherence assessment of eye drops in patients with glaucoma using 8 item Morisky Score: a cross sectional study. Rev. bras.oftalmol. 2016;75(6):432-437.
6. Granstrom PA. Progression of visual field defects in glaucoma. Relation to compliance with pilocarpine therapy. Arch Ophthalmol. 1985;103:529-531.



Volume 9, Issue 3; May-June 2026; Page No 114-119

7. Rossi GC, Pasinetti GM, Scudeller L, Radaelli R, et al. Do adherence rates and glaucomatous visual field progression correlate? Eur J Ophthalmol. 2011;21:410–414.
8. Ajit RR, Fenerty CH, Henson DB. Patterns and rate of adherence to glaucoma therapy using an electronic dosing aid. Eye (Lond). 2010 Aug; 24(8):1338-43.
9. Okeke CO, Quigley HA, Jampel HD, Ying GS, Plyler RJ, Jiang Y, Friedman DS. Interventions improve poor adherence with once daily glaucoma medications in electronically monitored patients. Ophthalmology. 2009 Dec; 116(12):2286-93.
10. Almidani L, Pan A, Bradley C, Pham A, Yohannan J. The Effect of Medication Adherence on Intraocular Pressure and Glaucoma Progression. Ophthalmol Glaucoma. 2026 Mar-Apr;9(2):158-165.



Volume 9, Issue 3; May-June 2026; Page No 114-119