



Original Research Article

## Assessing Quality of Life in Patients with Glaucoma Using the Glaucoma Quality of Life -15 (GQL-15) Questionnaire in Indian eyes

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### ABSTRACT

**Purpose:** Assessing Quality of Life in Patients with Glaucoma Using the Glaucoma Quality of Life -15 (GQL-15) Questionnaire in Indian eyes. **Materials and Methods:** Men and women with Primary Open Angle Glaucoma(POAG) who attended Glaucoma OPD of Nethradhama Superspeciality Eye Hospital (NSSEH, Jayanagar, Bangalore) between May 2013 and October 2013 were included for the study. During same period, control participants who had no family or personal history of glaucoma were recruited. **Results:** In this study totally 60 patients were enrolled. Total glaucoma patients (mild, moderate and severe) average age was 62.7 years and that of controls was 61.7 years. In this study males accounted for majority (37 out of 60) and females were 23 out of 60. The total GQL score in controls was 225 and total GQL-15 score in Glaucoma (Mild, moderate and severe) was 1519 (SD±6.73) P<0.0001. Mean GQL score was 33.75 in glaucoma subjects and 15 in controls. Subscale score showed that dark adaptation and glare was problematic to majority (368 was the total GQL score in Dark Adaptation and Glare sub-group). **Conclusion:** The Glaucoma Quality of Life-15 discriminated between quality of life in patients with glaucoma and subjects without glaucoma. Subjects with mild Glaucoma also experience reductions in G-QOL. Glaucoma subjects, especially with severe visual field loss, face significant difficulty in daily tasks.

**Key words:** Glaucoma, Glaucoma quality of life, disease severity, Glaucoma quality of life-15 questionnaire.

### INTRODUCTION

The ultimate goal in glaucoma management is maintenance of quality of life (QOL) through the preservation of vision. This often becomes secondary to assessment of intra-ocular pressures, visual field changes, and optic disc appearance. Decision to start treatment or change treatment for glaucoma is never easy and

must account for individual patient expectations. <sup>[1]</sup>

To this end an understanding of how the coma impacts individual's QOL is central to glaucoma management. Particularly knowledge of quality of life early in pathogenesis of glaucoma may help the patient and clinician better manage the disease during this critical period.

Recently awareness of the correlation between clinical indices of visual function and QOL has promulgated new approaches to management of glaucoma patients. Once regarded solely as a consequence of visual dysfunction, clinical trials suggest that changes in quality of life should be a key outcome measure of treatment. [1-5] Self-perceived vision-related QOL, however is not readily quantified by the clinician without the use of standardized assessment tools. [6] Several studies have demonstrated that patients in the early stages of progressive glaucoma experience deficits in glaucoma related QOL associated with self perceived visual dysfunction. [1-7,9] Among the available generic and vision-specific instruments employed in studies; popular QOL measures have included Short Form 36(SF-36) of Short Form 12 [5,8,10,11](SF-12), the 25 item National Eye Institute Visual Function Questionnaire (NEIVFQ-25), [3,10,12] the Visual Activities Questionnaire(VAQ) [9,13] the Activities of Daily Vision Scale [14,15] and the Visual Function Index-14. [11,15-17]

In this study, we evaluated self-reported QOL in patients with glaucoma using validated questionnaire, the Glaucoma Quality of Life -15(GQL-15). Specifically designed to assess QoL in patients with glaucoma, the GQL-15 has been shown to strongly correlate with both visual disability and psychophysical measures of visual function and to have high test-retest reproducibility. [1,7]

Our objective was to measure and compare quality of life in patients with and without glaucoma using the Glaucoma Quality of Life -15 questionnaire.

The various components of GQL-15 questionnaire are: Beginning with the question “Does your vision give you any difficulty, even with glasses, with the following activities?”

(1 No difficulty, 2 A little bit of difficulty, 3 Some difficulty, 4 Quite a lot of difficult, and Severe difficulty)

- 1) Reading newspapers
- 2) Walking after dark
- 3) Seeing at night
- 4) Walking on uneven road
- 5) Adjusting to bright lights.
- 6) Adjusting to dim lights.
- 7) Going from dark room and vice versa
- 8) Tripping over objects
- 9) Seeing objects coming from side
- 10) Crossing the road
- 11) Walking on steps/stairs
- 12) Bumping into objects
- 13) Judging distance of foot to step/surb
- 14) Finding dropped objects
- 15) Recognizing faces.

## MATERIALS AND METHODS

**Patient Selection:** We compared G-QoL in subjects with glaucoma and subjects without glaucoma using a prospective cross sectional study. Men and women with Primary Open Angle Glaucoma(POAG) who attended Glaucoma OPD of Nethradhama Superspeciality Eye Hospital (NSSEH, Jayanagar, Bangalore) between May 2013 and October 2013 were included for the study. During same period, control participants who had no family or personal history of glaucoma were recruited.

Subjects excluded:

- 1) Cataract
- 2) Diabetics
- 3) Macular degeneration
- 4) Stroke.

Eligible subjects were prospectively approached during regular scheduled follow-up visits: those giving consent were prospectively enrolled in the study. Subjects with POAG who had an established diagnosis in one or both eyes and had characteristic optic disc changes with or without raised IOP of glaucomatous visual

field loss demonstrated on the Humphrey Visual Field Analyzer 30-2 methodology> (Humphrey Instruments Inc, Allergan Humphrey, San Leandro, CA)

#### **Data collection:**

Before the completion of GQL-15 questionnaires, all subjects were interviewed face to face and provided demographic information. Snellen visual acuity of all subjects was recorded. White-on-white perimetry was performed using HFA SITA 30-2.

#### **Glaucoma Staging and Qol Measurement**

For the purpose of statistical analyses, subjects were stratified by glaucoma staging system (GSS) developed by Nelson and colleagues,<sup>[1]</sup> wherein the central visual fields were classified into 3 groups: “mild” (unilateral loss with less than half of visual field lost), “moderate”(unilateral loss with more than half of the visual field lost in each eye), of “severe” (bilateral loss with more than half of the visual field lost in either eye).

The GQL-15 questionnaire is composed of 15 items, which addresses 4 factors of visual disability: (1) Central and near vision; (2) Peripheral vision; (3) dark adaptation and glare; and (4) outdoor mobility. For the GQL-15 summary scores, item-level responses for each factor were factor were coded on scale of 0 to 5, where 0 signified abstinence from activity owing to non-visual reasons, 1 indicated no difficulty, and 5 represented severe difficulty. Summary scores represented the sum of item-level response scores with higher scores indicating poorer G-QOL. Sub-scale was calculated for each factor by averaging the sum of scores generated for the item-level responses. Higher subscale scores represented more difficulty with vision – related activities and poor G-QOL.

#### **Statistical analysis**

Age: Mean of age groups was taken.

Sex: Sex ratio was expressed as percentage.

GQL: GQL scores mean of controls was taken and mean of total glaucoma patients (mild, moderate and severe) was taken and well as mean of individual glaucoma groups was analysed. Standard deviation was calculated.

P value between control’s and glaucoma (Total glaucoma, mild, moderate and severe) as well as mild vs severe, mild vs moderate, moderate vs severe was analysed using Student T test.

The sub-scale categorical average GQL score was analyzed for controls and well as mild, moderate and severe as well as total (mild+moderate+severe glaucoma)

## **RESULTS**

In this study total 60 patients were enrolled. Total glaucoma patients (mild, moderate and severe) average age was 62.7 years and that of controls was 61.7 years. In this study males accounted for majority (37 out of 60) and females were 23 out of 60 (Figure 2). The total GQL score in controls was 225 and total GQL-15 score in Glaucoma (Mild, moderate and severe) was 1519 (SD±6.73) P<0.0001. CI ± 3.0374 at 0.95. This was statistically significant. Mean GQL score was 33.75 in glaucoma subjects and 15 in controls (Figure 3).

The total GQL score of controls was 225 and that of patients with mild glaucoma was 196 (SD±2.39). P value was <.0001. At 0.95 CI was ±7.97. This was statistically significant (Figure 4).

The total GQL score of controls was 225 and that of patients with moderate glaucoma was 1018 (SD+3.3). P value was <.0001. At 0.95 CI was ±3.14. This was statistically significant (Figure 5). The total GQL score of controls was 225 and that of patients with severe glaucoma was 305(SD±4.07). P value was <.0001. At 0.95 CI was ±15.37. This was statistically significant (Figure 6).

Subscale score showed that dark adaptation and glare was problematic to majority (368

was the total GQL score in Dark Adaptation

and Glare sub-group).

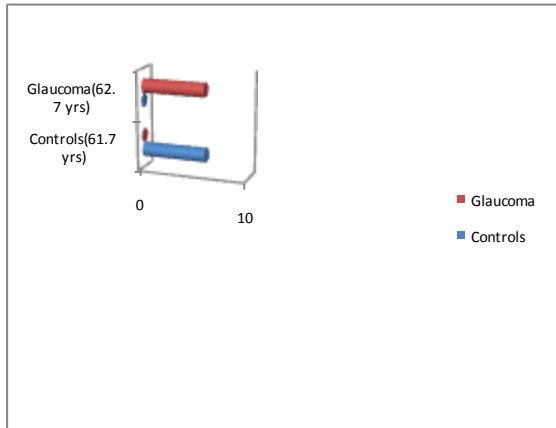


Figure 1. Mean age group of control vs glaucoma patients.

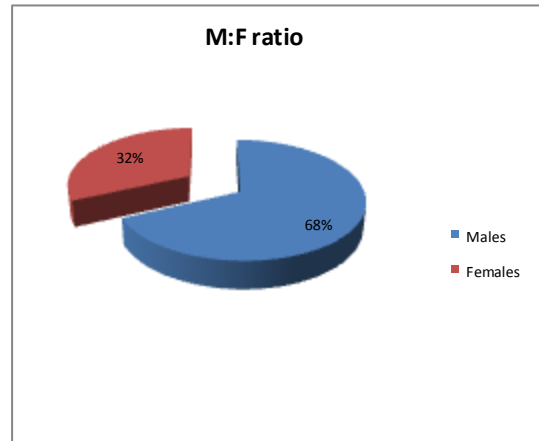


Figure 2. Male and Female ratio in the study.

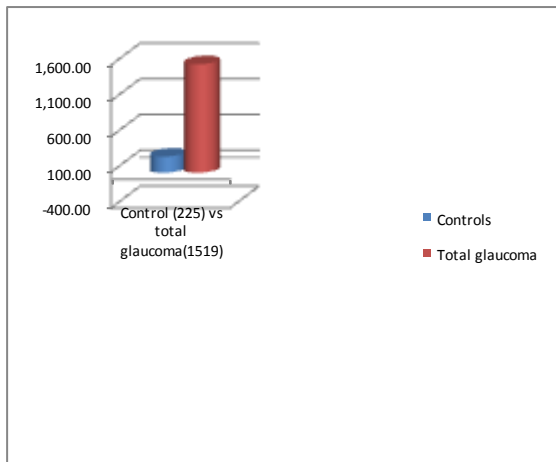


Figure 3. Mean GQL scores (Control vs Total ).

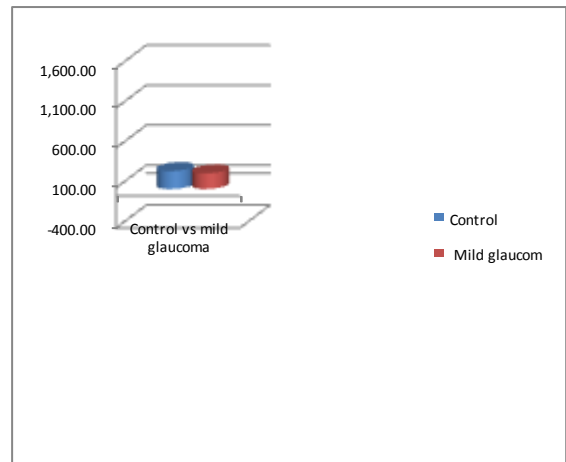


Figure 4. Mean GQL scores ( Control vs Mild ).

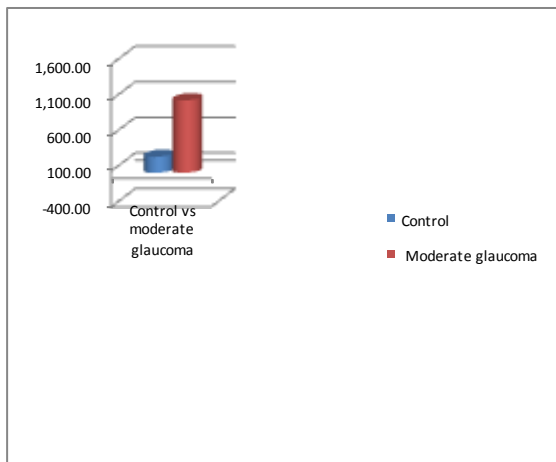


Figure 5. Mean GQL scores( Control vs Moderate ).

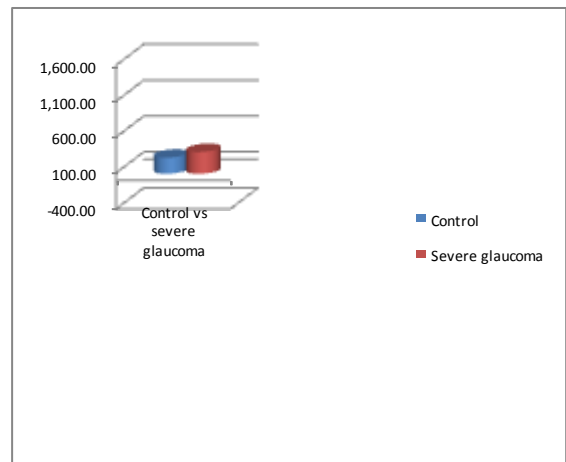


Figure 6. Mean GQL scores ( Control vs Severe ).

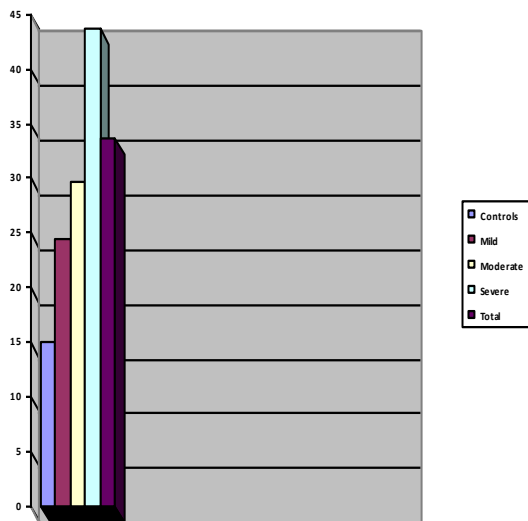


Figure: 7. Mean GQL scores (Control vs Mild, Moderate and Severe ) and P values.

Table 1: Sub scale score's(CNV-Central and near vision, PV-Peripheral vision, DAG – Dark and glare adaptation, OM-Outdoor motility).

Sub-scale scores	CNV	PV	DAG	OM
Controls	30	90	75	30
Mean	2	6	5	2
Mild	17	89	54	18
Mean	2.13	11.13	6.75	2.25
Moderate	94	407	327	164
Mean	3.13	13.56	10.9	5.46
Severe	29	130	108	49
Mean	4.14	18.5	15.42	7
Mean of Mild, Mod and Severe	9.5	8.3	11.6	5.1

Subscale score showed that dark adaptation and glare was problematic to majority. In mild, moderate and severe glaucoma patients dark adaptation and glare followed by difficulty in peripheral vision was problematic in moderate and severe glaucoma patients. In mild glaucoma patients DAG was most problematic followed by central and near vision. But overall dark adaptation and glare was problematic in majority.

## DISCUSSION

Disease spectrum of Glaucoma affects an individual with varying severity in various aspects of life including emotional, social, economical. We studied the impact of visual morbidity due to glaucoma in comparison to normal subjects. Using the GQL-15 questionnaire this study shows that across the spectrum of disease severity, patients with glaucoma experience difficulty in daily visual functions, which translates into measurable deficits in G-QOL. In this study mean age group of controls was 61.7(SD±10.87, Range 50 to 80 years) and that of glaucoma subjects was 62.7 (SD±12.48, Range 29 to 82) years. In the Goldberg et al [18] study mean age of patients with glaucoma was 70 versus 63 years for controls. In our study the age group was

comparable between controls and glaucoma group.

In our study Controls were 15 in number whereas glaucoma subjects were 30 in number in comparison to Goldberg et al [18] study 121 patients had glaucoma and 31 subjects who served as controls had no glaucoma.

In our study male subjects formed 62% and females accounted for 38% of the total subjects in the study. In the Goldberg et al [18] study 46.6% were males and 53.4% were females.

Total GQL score in this study was 1519 in 45 total glaucoma subjects and 225 in 15 controls. The summary score or mean score was 33.75(SD ± 6.72) in glaucoma subjects and 15 in controls. In the Goldberg et al [18] study summary score was 30.5 in total glaucoma subjects and 18.5 in controls.

In the present study mean GQL score was 24.5(SD ±2.39) in mild glaucoma subjects and 15 in controls. In the Goldberg et al [18] study Mean GQL was 21.7(SD±8.6) in mild glaucoma subjects and 18.5 in controls.

In the present study mean GQL score was 33.9(SD±3.3) in moderate glaucoma subjects and 15 in controls. In the Goldberg et al [18] study Mean GQL score was 29.6(SD±10.7) in moderate glaucoma and 18.5 in controls.

In the present study mean GQL score was 43.5(SD±4.07) in severe glaucoma and 15 in controls. In the Goldberg et al [18] study Mean GQL score was 40.0(SD±14.8) in severe glaucoma and 18.5 in controls.

Sub-scale scores: In the present study dark adaptation and glare was the most problematic in all glaucoma types (mild, moderate and severe). Sub-scale scores being 9.5, 8.3, 11.6 and 5.1 in patients with mild, moderate, severe glaucoma for Central and near vision(CNV), Peripheral vision(PV), Glare and dark adaptation(DAG), Outdoor motility(OM) respectively whereas in controls the sub-scale scores was 5, 3, 3 and 2 for CNV, PV, DAG and OM respectively. In the Goldberg et al [18] study dark adaptation and glare was the most problematic in all glaucoma types (mild, moderate and severe). Sub-scale scores being 21.2 for CNV, 24.6 for PNV, 32.0 for DAG and 18.6 for OM.

The analysis of observations taken from the patients with glaucoma showed significant correlations between G-QOL outcomes and clinical indices of visual dysfunction in the questionnaire.

The GQL-15 is specific for glaucoma; the subscale scores gave an opportunity to examine loss of G-QOL in the context of daily activities that may be troublesome especially in patients with glaucoma. In particular, glare and dark adaptation were most disabling for subjects with glaucoma in this study. This finding correlated with Nelson et al [1] and Collaborative Initial Glaucoma Treatment Study(CIGTS), [9] which also found these factors to be the most troublesome for patients with early glaucoma.

Overall, these outcomes suggest that certain functional problems become less pronounced as the disease progresses; perhaps patients adapt to their decreasing vision overtime, accept their reduced level of visual dysfunction. Overall, the GQL-15

summary and subscale scores generally reflected a trend of poorer G-QOL with increasing disease severity in patients with glaucoma.

The Nelson GSS [1] in classifying glaucoma in this study poses certain limitations. This system is not a perfect representation of disease severity as: (1) they individually assess different aspects of visual field loss reflecting disease severity (although there may be overlap); (2) it does not distinguish between central and peripheral visual field loss, which may differentially affect G-QOL.

Further, although we excluded patients with non-glaucomatous comorbidities affecting visual dysfunction, we did not account for presence of other conditions or disabilities not affecting the vision but potentially influencing the responses to certain questions regarding vision dependent functioning (e.g outdoor mobility).

As per this study the severity of visual problems, as assessed by the GQL-15 scores may be more significantly compromised in subjects with glaucoma, compared with non-affected subjects. This suggests the value for an Ophthalmologist to assess G-QOL at baseline after the diagnosis of glaucoma and from time to time thereafter.

The Nelson and Colleagues [1] study adopted a novel approach by focussing and introducing the concept of glaucoma-specific questionnaire in a pilot study and followed up with the validation of shorter GQL-15. The present study, Goldberg et al study and Nelson and Colleagues study demonstrate that problems encountered by patients with Glaucoma in everyday life were reflected in their performance on the GQL and GQL-15 respectively.

## CONCLUSION

The Glaucoma Quality of Life-15 discriminated between quality of life in patients with glaucoma and subjects without glaucoma. Subjects with mild Glaucoma also experience reductions in G-QOL. Glaucoma subjects, especially with severe visual field loss, face significant difficulty in daily tasks.

## RECOMMENDATIONS

- Targeted visual and social rehabilitative programs are necessary to improve social well being and independent functioning in patients with poor vision due to glaucoma.
- It is important to prevent progression such that activity limitation is minimized.
- Subjecting glaucoma subjects to such questionnaires by an Ophthalmologist at baseline as well as subsequent timely follow ups makes them aware of disease related problems and helps them to adhere to treatment and follow-up.

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