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Evaluating Quality Of Life In Indian Glaucoma Patients In A Tertiary Care Center: The GQL-15 Questionnaire Approach.

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ABSTRACT

Our study was focused on gauging the impact of glaucoma on patients' quality of life through the application of the Glaucoma Quality of Life-15 (GQL-15) questionnaire. This was a case-control study in which the GQL-15 questionnaire was used to evaluate the quality of 80 patients with glaucoma. The patients were classified according to the severity of Glaucoma and CQL scores were compared for different severity groups. The data were analysed by t-test and Mann-Whitney U test. A p-value of < 0.05 was considered significant. The 46 (57.5%) majority of eyes belonged to males while 34(42.5%) belonged to females. In mild situations, stereopsis measured 50 minutes of arc, whereas in moderate ones, it measured 116 minutes of arc. Severe cases showed a marked decline in the stereopsis with a mean value of 156 minutes of arc. The mean stereopsis was significantly increased with the severity of Glaucoma. The mean GQL score in mild cases was 21.55 ± 3.6 and in moderate cases, it was 28.06 ± 5.7 . Severe cases showed a significant increase in the GQL score with a mean value of 39.67 ± 5.5 . The mean scores of central and near vision, peripheral vision, dark adaptation & glare and outdoor mobility were 3.46 ± 1.54 , 10.28 ± 4.46 , 9.88 ± 4.00 and 2.38 ± 1.59 respectively. Administering questionnaires to glaucoma patients during initial assessments and regular follow-ups by an Ophthalmologist raises awareness of disease-related issues, fostering adherence to treatment and follow-up. Assessments of QoL serve as valuable tools for healthcare providers, enabling a more comprehensive understanding of the disease's effects from the patient's perspective. Our study emphasizes the vital role of quality of life (QoL) measures in gauging the impact of glaucoma. Beyond its physiological effects, glaucoma induces psychological distress and functional disabilities, with significant variations in GQL-15 scores across different disease stages.

Keywords: Glaucoma, Quality of life, *GQL-15*, disease severity.

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INTRODUCTION

Glaucoma presents a significant global public health challenge, standing as a leading cause of irreversible blindness. The World Health Organization (WHO) defines 'quality of life' (QoL) as an individual's subjective sense of overall well-being and fulfilment [1]. Approximately 57.5 million individuals worldwide are believed to suffer from primary open-angle glaucoma (POAG) [2]. In India, glaucoma ranks as the third most prevalent cause of blindness, following cataracts and refractive errors [3]. The country bears a significant burden of glaucoma, with an estimated 11.9 million cases and around 8.9 million individuals affected by blindness [4-9].

As healthcare evolves to prioritize enhancing patients' well-being, assessing QoL becomes increasingly integral. The choice of the GQL-15 questionnaire is justified by its focus on glaucoma-specific impairments, offering a comprehensive framework to evaluate functional disability resulting from the condition. Through a rigorous analysis of the GQL-15 questionnaire responses among Indian glaucoma patients at a tertiary care hospital, this study aims to significantly contribute to the literature on glaucoma's impact on QoL. It offers a contextualized perspective crucial for optimizing patient-centric care strategies.

MATERIALS AND METHODS

This study was conducted in a tertiary care hospital in central India. This was a cross-sectional study that included 40 patients of both genders, men and women with Glaucoma who attended a tertiary care hospital in central India from January 2023 to December 2023. Subjects excluded:

- Cataract
- Diabetics
- Macular degeneration
- Stroke.

Subjects with Glaucoma 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

The data of the study were collected using a predesigned structure questionnaire. Before the completion of the 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 SITA30-2.

Statistical analysis

The all data of the study was stored in a Microsoft Excel worksheet and statistical analysis was done using R-4.3.2 software. The data were summarised using frequency (percentage) and mean (standard deviation) for categorical and continuous variables respectively. The student's t-test was used to compare the continuous variables which were normally distributed and for non-normally distributed variables the Mann-Whitney Test was used. The p values less than 0.05 were considered significant.

RESULTS

Figure 1: Sex Distribution

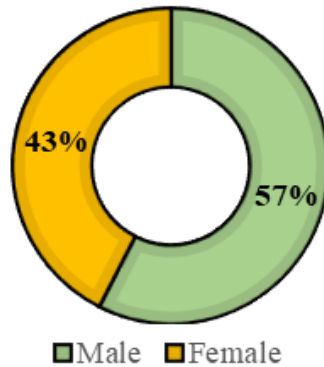


Figure 1: The sex distribution of eyes was uneven. The 46 (57.5%) majority of eyes were belonging to male while 34(42.5%) were belonging to female.

Figure 2 : Distribution of Cases by Type of Glaucoma

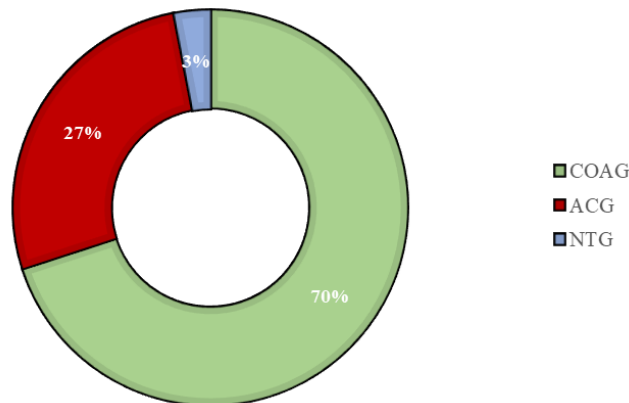


Figure 2: Almost three-fourths of the glaucoma patients, i.e., 70% were diagnosed as COAG (chronic open-angle glaucoma) whereas 27% of cases were ACG (angle closure glaucoma). Only 4% cases had normal tension glaucoma (NTG).

Figure 3: Distribution of Severity of Glaucoma

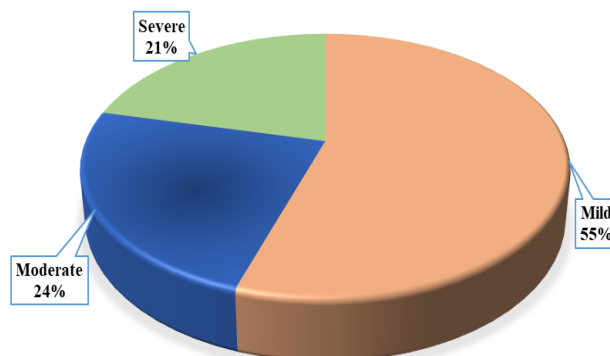


Figure 3: More than half of the cases, i.e., 55% were diagnosed to have mild glaucoma whereas there was 24% proportion of moderate and severe glaucoma patients, i.e., 21% each in this study.

Table 1: Association Binocular Contrast Sensitivity with Severity of Glaucoma

Severity of Glaucoma	Binocular contrast		P-value
	Mean	SD	
Mild	1.76	0.98	-
Moderate	1.47	0.68	0.0312
Severe	0.65	0.99	0.0058

Table 1: The mean binocular contrast sensitivity of mild cases (1.76 ± 0.98), was higher than that of moderate cases (1.47 ± 0.68), and it varied consistently as we progressed from mild to moderate, then to severe cases (mean 0.65 ± 0.99).

Table 2: Association of Stereopsis with Severity of Glaucoma

Severity of Glaucoma	Stereopsis (minutes of arc)		P-value
	Mean	SD	
Mild	50.50	10.90	-
Moderate	116.25	13.24	<0.0001
Severe	156.93	11.79	<0.0001

In mild situations, stereopsis measured 50 minutes of arc, whereas in moderate ones, it measured 116 minutes of arc. Severe cases showed a marked decline in the stereopsis with a mean value of 156 minutes of arc. The mean stereopsis was significantly increased with the severity of Glaucoma.

Table 3: Comparative evaluation of GQL -15 Score with Severity of Glaucoma

Severity of Glaucoma	GQL Score		P-Value
	Mean	SD	
Mild	21.55	3.6	-
Moderate	28.06	5.7	<0.0001
Severe	39.67	5.5	<0.0001

Table 3: The mean GQL score in mild cases was 21.55 ± 3.6 and in moderate cases, it was 28.06 ± 5.7 . Severe cases showed a significant increase in the GQL score with a mean value of 39.67 ± 5.5 .

Table 4: Comparison of GQL-15 factors scores

Factor	Mean	SD
Factor 1: central and near vision	3.46	1.541
Factor 2: peripheral vision	10.28	4.459
Factor 3: dark adaptation and glare	9.88	4.003
Factor 4: outdoor mobility	2.38	1.589

Table 4: The mean scores of central and near vision, peripheral vision, dark adaptation & glare and outdoor mobility were 3.46 ± 1.541 , 10.28 ± 4.46 , 9.88 ± 4.00 and 2.38 ± 1.59 respectively.

Mild vs Moderate

Table 5: Mild vs Moderate

Factor	Mean	95% Confidence interval		P-value
		Lower Limit	Upper Limit	
Factor 1	-0.87	-1.535	-0.205	0.0271
Factor 2	-6.13	-7.383	-4.877	0
Factor 3	-5.56	-6.802	-4.318	0.0282
Factor 4	-2.08	-2.589	-1.571	0.0133

Table 5: Factor scores for central and near vision (standardized mean difference (SMD) -0.87, 95% confidence interval (CI) -1.535 to -0.205, *p* value 0.0271), dark adaptation and glare (SMD -6.13, 95% CI -7.383 to -4.877, *p* value 0.00), peripheral vision (SMD -5.56, 95% CI -6.802 to -4.318, *p* value 0.0282), and outdoor mobility (SMD -2.08, 95% CI -2.589 to -1.571 *p* value 0.0133) differed significantly between patients with mild and moderate glaucoma.

Mild vs Severe

Table 6: Mild vs Severe

Factor	Mean	95% Confidence interval		P-value
		Lower Limit	Upper Limit	
Factor 1	-2.68	-3.423	-1.937	0.0005
Factor 2	-9.92	-11.55	-8.29	0.0007
Factor 3	-9.02	-10.402	-7.638	0.0004
Factor 4	-3.96	-4.4	-3.52	0.0001

Table 6: Significant differences were observed between factor scores for central and near vision (SMD -2.68, 95% CI -3.423 to -1.937), dark adaptation and glare (SMD -9.92, 95% CI -11.55 to -8.29), peripheral vision (SMD -9.02, 95% CI -10.402 to -7.638), and outdoor mobility (SMD -3.96, 95% CI -4.4 to -3.52). All the factor scores had *P* value < 0.001.

Moderate vs Severe

Table 7: Moderate vs Severe

Factor	Mean	95% Confidence interval		P-value
		Lower Limit	Upper Limit	
Factor 1	-2.56	-3.744	-1.376	0.0324
Factor 2	-4.58	-6.295	-2.865	0.0011
Factor 3	-3.96	-5.897	-2.023	0.0382
Factor 4	-1.98	-2.595	-1.365	0.0145

Table 7: Similar differences were found on comparing moderate and severe cases of glaucoma, for central and near vision (SMD -2.56, 95% CI -3.744 to -1.378), peripheral vision (SMD -4.58, 95% CI -6.295 to -2.865), dark adaptation and glare (SMD -3.96, 95% CI -5.897 to -2.023), and outdoor mobility (SMD -1.98, 95% CI -2.595 to -1.365). In both mild and severe cases of glaucoma, all exhibited *P* values of 0.05 indicating a significant difference between quality-of-life measures.

DISCUSSION

As the assessment of disease impact and healthcare effectiveness evolves, there's a growing emphasis on measuring quality of life (QoL) [8,10]. Understanding the relative importance of symptoms or disabilities is crucial for comprehending how a disease affects a patient's QoL. Glaucoma affects QoL through various channels. Besides its physiological implications, the diagnosis itself triggers psychological effects, causing anxiety and fear in patients and their families due to the realization of dealing with a chronic and potentially sight-threatening condition. Moreover, glaucoma leads to functional disability, accompanied by the inconveniences and side effects of treatment and follow-up procedures [11,12].

In our research, male participants comprised 57% of the total subjects, while females constituted the remaining 43%. In a study conducted by Goldberg et al [13], 46.6% were male, and 53.4% were female.

The average GQL score for mild cases was 21.55 ± 3.6, while moderate cases exhibited a mean score of 28.06 ± 5.7. In severe cases, there was a notable elevation in the GQL score, with a mean value of 39.67 ± 5.5. Comparable results were observed in a study conducted by Tripathi et al [14].

In this study, roughly 70% of individuals with glaucoma were identified with chronic open-angle glaucoma (COAG), while 27% of the cases were diagnosed as angle closure glaucoma (ACG). Merely 4% of the cases exhibited normal tension glaucoma (NTG). We categorized individuals with glaucoma into three classifications: early, moderate, and severe, depending on the extent of visual field impairment. Analysing the GQL-15 scores across these categories revealed a noteworthy distinction. The scores for the early glaucoma group exhibited a significant variance compared to both the moderate ($p < 0.001$) and advanced glaucoma groups ($p < 0.001$). Additionally, a substantial difference was observed between the scores of the moderate glaucoma group and those of the advanced glaucoma group ($p < 0.001$).

The GQL-15 is designed specifically for glaucoma, enabling an assessment of the impact on Glaucoma-Related Quality of Life (G-QOL) in the context of daily activities, particularly in individuals with glaucoma. Notably, glare and dark adaptation emerged as the most challenging factors for subjects with glaucoma in this investigation. This observation aligns with the findings of Nelson et al [15] and the Collaborative Initial Glaucoma Treatment Study (CIGTS) [16], both of which identified these aspects as the most problematic for individuals with early-stage glaucoma. In our study, Age was found to have a positive correlation with GQL-15 scores; thus, age had a negative impact on quality of life which was consistent with the study conducted by Kusumgar et al [17]

Numerous investigations have been carried out to evaluate the quality of life among individuals with glaucoma within Western populations. In contrast, limited research has been undertaken on Indian populations utilizing the GQL-15 questionnaire, and our study is among the few in this regard.

CONCLUSION

Our study emphasizes the vital role of quality of life (QoL) measures in gauging the impact of glaucoma. Beyond its physiological effects, glaucoma induces psychological distress and functional disabilities, with significant variations in GQL-15 scores across different disease stages. Glaucoma has a notable impact on the quality of life (QoL) for individuals, emphasizing the importance of safeguarding their visual function. Assessments of QoL serve as valuable tools for healthcare providers, enabling a more comprehensive understanding of the disease's effects from the patient's perspective. These evaluations also guide healthcare professionals in identifying priority areas for personalized patient management plans.

Recommendation

Preventing the progression of glaucoma is essential for minimizing disruptions in daily activities. Conducting questionnaires with glaucoma patients during initial evaluations and regular check-ups by an ophthalmologist helps raise awareness of disease-related concerns, encouraging adherence to treatment and follow-up protocols.

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