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Prevalence and Correlates of Anxiety and Depression in Glaucoma and Cataract Patients: A Cross-sectional Comparison

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Abstract

Background: According to WHO, a leading cause of blindness includes cataracts and glaucoma. These patients often face significant mental health problems. People have concerns when diagnosed with cataracts or glaucoma, such as potential blindness, treatment costs, and self-sufficiency. These factors can lead to anxiety and depression. Comparing the psychological impact of these conditions can help identify specific contributing factors and develop tailored mental health interventions.

Materials and Methods: Consecutive patients diagnosed with cataracts or primary open-angle glaucoma were recruited. The sample included 100 patients (50 each) with primary open-angle glaucoma and cataracts attending the ophthalmology outpatient department. Data was collected on the specially designed proforma and assessed using the Hospital anxiety and depression scale (HADS).

Results and Discussion: Nearly double the number of glaucoma patients experienced anxiety and depression compared to cataracts. Anxiety in glaucoma was associated with occupation and monthly income, and anxiety in cataracts was associated with marital status. Depression in glaucoma was associated with occupation and marital status, whereas depression in cataracts was associated with marital status.

Conclusion: Anxiety and depression exist as co-morbidities of glaucoma and cataracts. The lack of association with ocular clinical factors suggests that targeted high-risk subgroup screening of persons with glaucoma is not feasible and screening all persons with glaucoma for anxiety may be necessary. This study emphasizes the importance of combined management with a psychiatrist, especially for glaucoma. Regular psychiatric counseling can help patients manage emotions and improve medication adherence.

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Introduction

Impairments in vision are highly prevalent, affecting roughly 2.2 billion people worldwide.[1] According to the WHO, the main conditions causing these include cataracts (94 million) and glaucoma (7.7 million). As the prevalence of vision impairment continues to rise, the need to better understand the wide-rang-

ing impact of these impairments on an individual's mental health, as neglected comorbid mental problems impose an extra burden on the patient, leading to worsening of the condition, a longer hospital stay, and increased costs of care.

Glaucoma and cataract patients experience anxiety as they have many concerns, such as whether they will go blind, how expensive treatment will be, how many medical procedures they will need over their life, regarding their job, whether they will be able to drive, and regarding their self-sufficiency.

Patients with cataracts often experience blurred vision, glare, and halos due to light. Such ocular symptoms can cause great discomfort and restrictions in daily activities, and hence, feelings of worthlessness and hopelessness. Activities that were once enjoyed, such as reading and driving, may become challenging for glaucoma and cataract patients, leading to feelings of loneliness, social isolation, and depression. In addition to progressive vision loss, lifelong application of multiple medications, frequent follow-ups, and depression have been reported in patients with glaucoma. Previous studies have also shown an association between β-blocker eye drops (a common glaucoma treatment) and depression.[2,3] Other proposed threads in glaucoma and depression include reduced brain-derived neurotrophic factor, neuroinflammation, autonomic dysfunction, and lifestyle.[4] In addition, impaired perception of light input due to glaucoma can subsequently lead to abnormal serum levels of melatonin, resulting in circadian rhythm misalignment.[5]

Glaucoma and cataracts are chronic eye diseases, but they have different courses, treatments, and prognoses. Comparing the psychological impact of these conditions can help identify specific factors that contributed to each group and then develop tailored mental health interventions. These comparative data can also be used to allocate resources more effectively and to guide healthcare policies and funding decisions. A limited number of studies highlight these issues in the Hadoti region of Rajasthan. This region has a significant proportion of the population involved in stone quarrying and manufacturing, which exposes them to dust, chemicals, or other eye irritants, making them prone to glaucoma and cataracts. In addition, Kota is a hub for medical and engineering students. An intense study schedule, prolonged screen time, and high levels of academic stress influence the eye health of these students. Understanding anxiety and depression in glaucoma and cataract patients within the specific cultural, occupational, and geographical contexts of the Hadoti region can contribute to better understanding and improving their mental health outcomes. Hence, this study aimed to compare anxiety and depression in glaucoma and cataract patients and their association with sociodemographic factors.

Materials And Methods

This cross-sectional descriptive study was conducted at a tertiary care center in western India in the ophthalmology outpatient department from January 2023 to December 2023, with permission from the ethical committee. Consecutive patients with a diagnosis of cataract and primary open-angle glaucoma were recruited for the study. The sample was targeted to include 100 patients (50 each with primary open-angle glaucoma and cataracts) who had given consent to participate in the study and were at least 18 years of age. If no patient completed the full questionnaire, it was replaced by another one. We excluded patients with any other form of optic neuropathy and the presence of any organic disorder, cognitive impairment, or current use of any medication due to a psychiatric disorder, or with known systemic comorbidities, such as hypertension, diabetes mellitus, asthma, migraine, sickle cell disease, arthritis, kidney disease, thyroid disease, stroke, cardiac disease, cancer, human immunodeficiency virus syndrome, and other major systemic problems. Sociodemographic data were collected using a semi-structured sociodemographic profile. Patients were assessed using the hospital anxiety and depression scale (HADS).

HADS[6]- HADS was developed to measure the symptoms of anxiety (HADS-A) and depression (HADS-D) for both dimensional and categorical aspects. The questionnaire comprised 7 questions for anxiety and 7 questions for depression. Although the anxiety and depression questions were interspersed in the questionnaire, they were scored

separately. Each item is scored on a 4-point Likert scale (0 = not at all to 3 = nearly all the time); thus, each subscale can range from 0 to 21. Scores are interpreted as non-case (0–7), mild (8–10), moderate (11–14), or severe (15–21) symptoms. Data collected was classified, tabulated and analyzed by using the statistical package for social sciences (SPSS-23) software. Categorical variables such as age range, sex, employment status, and hospital anxiety and depression scores are presented as frequencies and percentages; differences were compared using the chi-square test, and *p-value* <0.05 was taken as statistically significant.

Results

Table 1 describes the association of sociodemographic factors with anxiety and depression in glaucoma patients. Of the 50 glaucoma patients, 35 (70%) were males and 15 (30%) were female. Age and sex were not significantly associated with anxiety or depression.

More than half of the total cases, that is, 58% of glaucoma cases, were found in the < 5000 income group, and anxiety was found to be significantly associated (p <0.01) with income.

When associations were observed between occupation and marital status, a significant difference was observed in anxiety and depression. (p = 0.007 and p = 0.006, respectively) and (p = 0.009), respectively, and there was no significant difference between marital status and anxiety. (p = 0.52). Almost 66% of glaucoma participants used B blockers, and the association with both anxiety and depression was found to be non-significant. (p = 0.78 and p = 0.76). As far as the clinical examination of glaucoma cases is concerned in this study, the pain was found in 58% of cases, severe visual impairment in the right eye in 46%, and in the left eye in 40%. The association of psychiatric comorbidity with findings on clinical examination of glaucoma cases was not statistically significant with visual acuity of both the right and left eye and pain.

Table 2 summarizes the association between sociodemographic factors and anxiety and depression in cataract patients. Of the 50 cataract cases, 32 (64%) were male and 18 (36%) were female, and the maximum number of cases was less than 5000. Income, education, and occupation were not significantly associated with anxiety and depression in patients with cataracts. Marital status was significantly associated with anxiety and depression (p = 0.0002 and p < 0.0001, respectively). As far as the clinical examination of cataract cases is concerned in this study, moderate visual impairment in the right eye was 48% and in the left eye was 40%. The association of psychiatric comorbidity with findings on clinical examination of cataract cases was not significant with respect to the right (p = 0.28 and p = 0.052) and left eye (p = 0.59 and p = 0.5), respectively.

As shown in Table 3, nearly double the number of glaucoma patients experienced anxiety compared to the cataract group.

Table 4 summarizes the distribution of the patients with depression. The number of glaucoma patients with depression was half that of the cataract group.

As shown in Tables 5 and 6, a greater number of glaucoma patients had mild, moderate (almost double), and severe (almost double) anxiety than the cataract group. None of the cataract participants had severe depression, but 10% of the patients with glaucoma were reported to have severe depression.

Discussion

In our study, we examined the association between sociodemographic and clinical characteristics and anxiety and depression in both glaucoma and cataract patients. We also compared anxiety and depression levels between patients with glaucoma and cataracts. We found that anxiety in glaucoma was significantly associated with occupational status and monthly income but not significantly associated with age, sex, education, marital status, visual acuity, domicile, and duration of illness. These associations can be attributed to long-term healthcare expenditure in glaucoma patients. Depression in glaucoma was significantly associated with occupation but not with age, sex, education, and visual acuity. Those who were unemployed were more likely to be depressed than those who were unemployed. This could be because unemployed patients cannot distract themselves from the pain

Table 1: Association of sociodemographic factors and clinical characteristics of glaucoma with anxiety and depression in glaucoma cases

Sociodemographic characteristics		*Glaucoma participants*	*Anxiety (n = 19)*	*DEP (N = 10)*
Sex	Male	35	12	6
	Female	15	7	4
			CHI = 0.25 *p* = .611	CHI = 0.15 *p* =.70
Age	<40	7	4	2
	41–60	26	10	4
	61–80	17	5	4
			CHI = 1.6 *p* = .45	CHI = 0.15 *p* = .70
Education	Primary	06	2	1
	Middle class	05	2	1
	Secondary + Sr. Secondary	12	5	3
	Graduate	15	4	3
	Illiterate	12	6	2
			CHI = 1.6 *p* = 0.8	CHI = 0.32 *p* = .98
Occupation	Unemployed	09	8	6
	Govt. job	08	0	0
	Housewife	08	2	1
	farmer	11	4	2
	Labor	10	4	1
	Businessman	04	1	0
			CHI = 15.7 *p* = 0.007*	CHI = 16.18 *p* = 0.006*
Monthly income	<5000	29	16	9
	5000–10,000	8	2	1
	10,000–15,000	3	1	0
	>15000	10	0	0
			CHI = 10.36 *p* = 0.01*	CHI = 5.8 *p* = .13
Marital status	Married	38	13	4
	Unmarried	7	3	3
	Widowed	5	3	3
			CHI = 1.32 *p* = .52	CHI = 9.42 *p* = .009*

V.A (Right Eye)	Normal	10	3	1
	Moderate visual impairment	12	5	3
	Severe visual impairment	23	9	4
	Blind	5	2	2
			CHI = 0.36 *p* = .95	CHI = 2.93 *p* = .40
V.A (Left Eye)	Normal	12	2	1
	Moderate visual impairment	14	7	4
	Severe visual impairment	20	9	4
	Blind	4	1	1
			CHI = 3.87 *p* = .27	CHI = 1.72 *p* = .63
Duration of illness	<1	5	3	2
(Years)	1-2	13	7	2
	>2	32	9	6
			CHI = 3.7 *p* =.15	CHI = 1.45 *p* = .48
B blocker	yes	33	13	7
	no	17	6	3
			CHI =.08 *p* = .78	CHI = .08 *p* = .76
Pain	Yes	29	14	8
	No	21	5	2
			CHI = 3.09 *p* = .07	CHI = 2.4 *p* = .11

Table 2: Association of sociodemographic factors and clinical characteristics of cataract with anxiety and depression in cataract cases

Characteristics		*Cataract participants*	*Anxiety (n = 9)*	*DEP (N = 5)*
Sex	Male	32	4	2
	Female	18	5	3
			CHI = .94 *p* = .34	CHI = .48 *p* = .50
Age	<40	3	2	1
	41–60	27	3	2
	61–80	20	4	2
			CHI = 5.7 *p* = .056	CHI = 2.01 *p* = .36

Education	Primary	04	1	0
	Middle class	04	2	2
	Secondary + Sr. Secondary	10	1	1
	Graduate	04	1	0
	Illiterate	28	4	2
			CHI = 3.73 *p* = .44	CHI = 8.25 *p* = 0.08
Occupation	Unemployed	3	1	1
	Govt. job	4	0	0
	Housewife	5	2	1
	farmer	24	3	2
	Labor	6	2	1
	Businessman	8	1	0
			CHI = 4.60 *p* = 0.46	CHI = 4.07 *p* = 0.53
Monthly income	<5000	23	6	4
	5000–10,000	7	1	1
	10,000–15,000	9	1	0
	>15000	11	1	0
			CHI = 1.96 *p* = .58	CHI = 3.76 *p* = 0.29
Marital status	Married	45	5	2
	Unmarried	2	1	0
	Widowed	3	3	3
			CHI = 16.5 *p* = 0.0002*	CHI = 28.7 *p* <0.0001*
V. A (right eye)	Normal	4	1	0
	Moderate visual impairment	24	2	1
	Severe visual impairment	14	3	1
	Blind	8	3	3
			CHI = 3.82 *p* = 0.28	CHI = 8.2 *p* = 0.052
V.A (left eye)	Normal	11	1	0
	Moderate visual impairment	20	3	2
	Severe visual impairment	13	3	2
	Blind	6	2	1
			CHI = 1.89 *p* = .59	CHI = 1.93 *p* = 0.5

Duration of illness (years)	<1	28	5	3
	1–2	14	2	1
	>2	8	2	1
			CHI = 0.3 *p* = .82	CHI = 0.19 *p* = .9

Table 3: Distribution of patients according to anxiety

Anxiety	*Glaucoma group*		*Cataract group*		*Chi-square value*	*p-value*
	N = 50	*%*	*N = 50*	*%*		
Present	19	38	9	18	4.01	0.045*
Absent	31	62	41	82		

Table 4: Distribution of patients according to depression

Depression	*Glaucoma group*		*Cataract group*		*Chi-square value*	*p-value*
	N = 50	*%*	*N = 50*	*%*		
Present	10	20	5	10	1.26	0.26
Absent	40	80	45	90		

Table 5: Comparison of HADS (Anxiety) severity between glaucoma and cataract group

Anxiety level	*Glaucoma group*		*Cataract group*		*Chi-square value*	*p-value*
	N = 50	*%*	*N = 50*	*%*		
Nil(0-7)	31	62	41	82	5.13	0.16
Mild anxiety (8-10)	9	18	5	10		
Moderate anxiety (11-14)	8	16	3	6		
Severe anxiety (15-21)	2	4	1	2		

Table 6: Comparison of HADS (Depression) severity between glaucoma and cataract group

Depression level	*Glaucoma group*		*Cataract group*		*Chi-square value*	*p-value*
	N = 50	*%*	*N = 50*	*%*		
Nil (0-7)	40	80	45	90	5.29	0.15
Mild depression (8-10)	3	6	3	6		
Moderate depression (11-14)	2	4	2	4		
Severe depression (15-21)	5	10	0	0		

and worries associated with glaucoma. This could also be a result of the challenges in coping with the financial challenges in their day-to-day activities as well as the challenges with glaucoma and its management. Marital status was significantly associated with depression in both glaucoma and cataract cases. This could be due to the lack of emotional, financial, and social support in unmarried

and widowed patients and more struggles with daily tasks.

Neither anxiety nor depression in glaucoma was associated with the use of beta-blockers. This could be due to the use of topical beta-blockers instead of systemic beta-blockers. This finding is consistent with those of Reimer *et al*.[7] and Okudo *et al*.[8]. Our study also highlighted that the lack of association between visual acuity and cataracts and glaucoma suggests the possibility that depression and anxiety are related to the anticipation or perception of deteriorating vision rather than actual visual acuity. A population-based study conducted by Wang *et al*.[9] reported that the association between depression and glaucoma reflected patient perceptions and subjective experiences of their illness rather than conventional objective measures of glaucoma severity.

Our study also highlighted that a higher percentage of glaucoma patients experienced anxiety than did cataract patients, and this difference was statistically significant. This finding is consistent with those reported by Mabuchi *et al*. (2008)[10] in Japan, where 10.9% of glaucoma cases were anxious compared to 5.2% of controls, which were also cataract patients. This may be because glaucoma is a chronic irreversible disease, the initial anxiety being the result of efforts to find a final cure to a threatening visual loss after previous disappointing remedies, unlike cataract patients, where vision can be restored through surgery, one of the most common operative procedures performed worldwide because of its high efficacy and minimal complications.

About a third (38%) of glaucoma participants were found to be anxious. in our study, which shows that anxiety is an issue that needs to be addressed among these patients. This was similar to the findings reported by Uzma *et al*.,[11] in which 33% of the patients were anxious. A lower prevalence (22.92%) was seen in clinic patients in Shanghai, China studied by Zhou C *et al*.[12]

Our study showed that glaucoma participants had a two times higher risk of depression than the cataract group, although this finding was not significant. Similar findings were reported in a study by Okudo *et al*.[8], which showed that glaucoma participants had a four times higher risk of depression. The increased risk of depression in glaucoma might be partly due to the chronicity of the illness, the risk of blindness, and various treatment challenges, especially treatment findings in glaucoma patients and/or their relatives.

In our study depression was present in 20% of glaucoma patients and 10% of cataract patients which was comparable to depression found in 22% of glaucoma patients by Akindipe *et al*.[13] and 25.5% of patients in the study done by Okudo *et al*.[8] To date, few studies have evaluated the differences in the risk of depression between patients with and without cataract. McGwin *et al*.[14] 2003 found a marginally higher depressive score in cataract patients (7.6 and 5.3 in cataract and non-cataract patients, respectively); this was measured using the epidemiological studies-depression scale. wang *et al*.[15] conducted another community-based survey and found slightly higher odds of mental health contact for depression or anxiety in patients with cataracts (OR 1.33). We found anxiety levels of 18% for mild, 16% for moderate, and 4% for severe in patients with glaucoma. Anxiety levels were 10, 6, and 2% for mild, moderate, and severe anxiety, respectively. This finding highlighted that all three levels of anxiety were higher in glaucoma patients and could be due to the irreversible nature of the illness, so the fear of going blind permanently.

In our study, we found depression levels of 6, 4% for moderate and 10% for mild, moderate, and severe depression, respectively. Mild and moderate level of depression levels were found in 6%, and 4% of cataract patients respectively. As this was a cross-sectional study, causality between the compared variables cannot be established. The surveyed population in this study was relatively small and the self-reported measures may be affected by recall bias, thus may influence the interpretation of the results.

This study highlighted that all three levels of depression were higher in glaucoma patients and no cataract patient experienced severe depression. This could be again due to the fact that cataract is a reversible disease, and the patient is aware of the temporary nature of blindness.

Conclusion

In conclusion, anxiety and depression exist as comorbidities in both glaucoma and cataracts. Anxiety levels were significantly higher in the glaucoma group than in the cataract group. Depression was also found to be higher in the glaucoma group, but not significantly higher than that in the cataract group. Anxiety was found to be associated with occupation and monthly income in glaucoma cases, while depression was associated with occupation and marital status, which suggests opportunities for employment for these patients. In cataracts, both anxiety and depression were found to be associated with marital status, which suggests a role for social support in visually impaired individuals. The lack of association between ocular clinical factors such as visual acuity, pain, and beta-blockers suggests that targeted high-risk subgroup screening of individuals with glaucoma is not feasible. This also suggests that concerns about having to live with vision loss in the future and/or having to cope with the knowledge that one has a progressive condition can contribute to anxiety, even in the absence of reduced visual abilities. The high levels of anxiety and depression indicate that it may be necessary to screen all individuals with glaucoma for anxiety and depression.

Author Contribution

Dr Shreya Gupta: Design of the study, acquisition of data, drafting of the manuscript; Dr. Sonali Dagar: Design of the study, acquisition of data, drafting of the manuscript; Dr. Kuldeep Singh: Conception, design of the study, revised it critically for important intellectual content; Dr. Vinod Daria: Conception, design of the study, revised it critically for important intellectual content.

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Conflict of Interest

None declared.

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