

## The economic burden of glaucoma on patients

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**Purpose:** To determine the economic burden of glaucoma on patients. **Methods:** A cross-sectional study was conducted on glaucoma patients diagnosed at least 6 weeks prior to the study and on topical anti-glaucoma medications. After consenting, patients were asked about their monthly income, education, occupation, treatment duration, drugs being used, cost of drugs, one bottle lasts for, financial dependence for treatment, glaucoma surgery, transportation means and cost, etc. Also, information regarding government reimbursement of medical costs was collected. **Results:** Seventy-four patients aged 60.18±11.5 years (40 males and 34 females) were enrolled. Majority were retirees (37.84%) and Homemakers (29.73%). Fifty (68%) participants didn't earn anything. Sixty-three patients had bilateral involvement and 52.70% were on treatment for >3 years. Prostaglandin analogs were most commonly used drugs (34.21%). Average cost of medications and travelling was ₹669.46 per month and ₹203.38 per visit respectively. Majority were financially responsible for their own treatment (62.16%). Patients had an average monthly income of ₹7108.11. Low-income group spent 26.08 % of their monthly salary on glaucoma treatment. Low-moderate and high-income group spent 5.17% and 1.50% of their monthly income respectively. Only 4.05% were covered by government reimbursement. Gender (P=0.019), occupation (P=0.010), whether undergone surgery (P=0.007), whether accompanied (P=0.027), hours lost during each visit (P=0.016) and treatment impression (P=0.027) showed statistical significance when associated with financial dependence. **Conclusion:** Treatment should be modified according to the patient's socioeconomic status. Glaucoma education programs and screening camps in remote areas would help in early detection of the disease.

**Key words:** Burden, compliance, glaucoma

"Glaucoma" is a collective term that describes a heterogeneous group of conditions that have in common an irreversible and usually progressive optic neuropathy characterized by distinctive patterns of structural change in the optic nerve head accompanied by loss of visual function (visual field loss) that are often related to raised intraocular pressure (IOP).<sup>[1]</sup> Since these changes are slow, many patients are unaware of the underlying disease.<sup>[2]</sup> The different types of glaucoma include primary open-angle glaucoma (POAG), narrow-angle glaucoma (NAG), and secondary glaucoma.<sup>[1]</sup>

Glaucoma is the second-leading cause of world blindness after cataract.<sup>[2]</sup> Worldwide, the prevalence of glaucoma is increasing and is expected to affect 111.8 million people by 2040. The prevalence of NAG and open-angle glaucoma are reported to be highest in Asia and Africa, respectively.<sup>[3,4]</sup> The prevalence of POAG and primary angle-closure glaucoma (PACG) in India is 6.48 million and 2.54 million, respectively.<sup>[5]</sup> India accounts for at least 12.9% of POAG-induced blindness and 12.7% of PACG-induced blindness in the world.<sup>[4]</sup> Glaucoma contributes 1.96% to the overall burden of diseases in India.<sup>[5]</sup>

As glaucoma is irreversible, early detection and management of the disease is of utmost importance.<sup>[2]</sup> The main objective of glaucoma management is to preserve the patient's quality of life.<sup>[6]</sup> Progression of glaucoma may be controlled and loss

of vision may be minimized or ceased through the use of medications, surgery, or laser therapy.<sup>[1]</sup>

Cost-of-illness studies determine the total financial burden of a disease by taking into account the direct and indirect costs of managing the disease, such as medication, diagnostics, and surgery.<sup>[7]</sup> The first economic study of glaucoma, conducted in the UK, estimated that in 1990 the costs associated with blindness because of glaucoma probably exceeded £130 million.<sup>[1]</sup> Cost-of-illness studies have shown that considering direct medical costs is important, with direct and indirect nonmedical costs also being very considerable as this has caused noncompliance on the part of patients, mainly among those who are on "modern" topical medication and multiple schedules, leading to a vicious circle that eventually worsens the visual outcome.<sup>[8]</sup>

Glaucoma has undoubtedly caused significant stress on family finances.<sup>[8]</sup> Developing nations are disproportionately burdened with blindness which results in decreased productivity and care costs, thereby limiting society's economic resources.<sup>[9]</sup> Due to economic challenges, patients may find it difficult to comply with the treatment modalities. If the disease worsens, patients require additional medications, additional

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diagnostic tests, and frequent follow-up visits that further increases treatment costs.<sup>[10]</sup>

Therefore, this study was performed to determine the extent to which glaucoma challenges patients economically. The circumstances leading to and promoting this financial hardship were also investigated so that recommendations, if any, can be made to lighten the burden.

## Methods

A cross-sectional study was conducted among patients visiting a tertiary eye care hospital for a period of three months from July 2021 to September 2021. Patients aged 18 years and above with POAG, NAG, or secondary glaucoma diagnosed at least six weeks prior to the study and on topical anti-glaucoma medication (AGM) were included. Patients having congenital or juvenile glaucoma, history of dementia, coexisting psychiatric disorders, patients willing to keep their personal data confidential, or who did not give their consent to the study were excluded.

All patients underwent a thorough ocular examination that included visual acuity (logMAR units), IOP measurement using applanation tonometer, assessment of peripheral anterior chamber depth (ACD) using Van Herick technique, gonioscopy using a three-mirror gonioscope lens, and slit-lamp and fundus examination. Their medical and ophthalmic history were recorded. The cup-to-disc ratio (C: D) was measured using indirect ophthalmoscope and morphological changes of the optic nerve head were noted. Patients who met the inclusion criteria were given a verbal explanation in the best understood language after which verbal and written consent was taken. The study was approved by the institutional ethics committee of the hospital and was performed in accordance with the ethical standards laid down in the Declaration of Helsinki.

A single interviewer filled out a standard pre-designed questionnaire<sup>[8]</sup> for each patient via direct questioning. Patients were asked in detail about their age, name, gender, address, education level, occupation, and income. The economic burden due to the disease was evaluated wherein direct and indirect costs were inquired. The patients were asked about the duration of glaucoma treatment, the drugs being used, the average cost of drugs per month, the average time one bottle lasted, financial dependence for treatment, whether the patient was offered glaucoma surgery—and if they had undergone this surgery, then the cost of it—about follow-up frequency, transportation means and cost per visit, whether they were required to accompany, about man hours lost during each visit, waiting time before being attended by the doctor, their general impression about the treatment they are receiving now, and history of systemic illness. Information regarding health insurance cover or reimbursement of medical costs was collected too. Also, patients were inquired about expenditure strain and self-reported compliance was noted.

The data collected was cleaned, edited and coded in Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) version 14.0 (IBM Corporation, USA). The population was normally distributed according to the Kolmogorov–Smirnov test. Data were represented as numbers and percentages. Various factors were associated with the treatment payer and total expenditure per month

using the Chi-squared test. A *P* value of <0.05 was considered statistically significant.

## Results

A total of 74 patients who gave their consent were interviewed. The average age of the participants was  $60.18 \pm 11.52$  years. A majority of them were in the age group of 61–70 years. There were 40 males (54.05%) and 34 females (45.95%). Twelve point one six percent of the participants were illiterates, while only 11 patients had completed their graduation. Homemakers (29.73%) formed the largest occupational group. Also, the sample included a large number of retirees (37.84%). Two point seven percent of the people were unemployed due to glaucoma. Two patients had a monthly income of <₹5000, 17 earned between ₹5000 and ₹30,000, and only 5 patients had a monthly income of >₹30,000. Furthermore, 50 participants did not earn anything.

Sixty-three patients had bilateral involvement of glaucoma and 52.70% of the patients were on a treatment duration for more than three years. More than half of the patients had POAG (54.05%). Sixty-four patients visited a government hospital since the disease was diagnosed, whereas 10 of them initially visited a private hospital and later shifted to a government one due to financial burden. Prostaglandin analogs were the most commonly used drugs by 39 patients, and 20 patients used a combination drug. From the reported usage of patients, one 5 ml bottle lasted for an average of four weeks when used bilaterally ( $n = 40$ , 60.81%). The monthly cost of medications was between ₹60 and ₹3000 with an average of ₹669.46. Thirty-three subjects had been offered surgery and 30 patients preferred undergoing it.

A majority of the patients had a monthly follow-up ( $n = 46$ ), while only five patients visited the hospital every two weeks. Twelve patients required someone to accompany them. Thirty-nine patients travelled by public transport and 35 had access to a private vehicle with the cost of each visit ranging from ₹50 to ₹500 (average ₹203.378 per visit). As reported, 67 patients were attended to within 1–2 hours and only 7 patients had to wait for 2–4 hours before seeing the doctor per visit. Twenty-one participants had to take one day's leave to visit the hospital, out of which 13 people lost a part their of income.

Twenty-three point seven six percent of the participants were on treatment for diabetes, 24.75% were on treatment for hypertension, while 11.88% had other illnesses. However, 39.60% had no systemic diseases. Twenty-seven patients reported feeling better than when they had initially presented while nine participants felt worse despite treatment. The majority (62.16%) of the participants were financially responsible for their treatment. Three patients had other sources (government reimbursement) paying for them. Also, 43 patients reported having an expenditure strain. Twenty-nine patients were non-compliant with topical AGM, with 28% of them citing cost as their main reason.

The approximate monthly income of the patients varied between ₹0 to ₹80,000, with an average of ₹7108.11 per month. Fifty patients had no income and mostly paid with their pension money. Patients with low income (<₹5000/month) had a mean expenditure of ₹695 on medication and ₹217.30 on transport. This accounted for 26.08% of their monthly income. Patients

**Table 1: Factors associated with financial dependence for medical expenditure and its P**

Factors	Treatment payer					P
	Self n=46 (%)	Children n=16 (%)	Spouse n=5 (%)	Government n=3 (%)	Mix n=4 (%)	
<b>Age</b>						
30-40 years	3 (6.52)	0	0	0	0	0.134
41-50 years	8 (17.39)	0	3 (60)	0	0	
51-60 years	11 (23.91)	3 (18.75)	2 (40)	3 (100)	2 (50)	
61-70 years	16 (34.78)	11 (68.75)	0	0	1 (25)	
71-80 years	7 (15.21)	2 (12.5)	0	0	1 (25)	
81-90 years	1 (2.17)	0	0	0	0	
<b>Gender</b>						
Male	28 (60.86)	6 (37.5)	0	3 (100)	3 (75)	0.019
Female	18 (39.13)	10 (62.5)	5 (100)	0	1 (25)	
<b>Education</b>						
Illiterate	3 (6.52)	5 (31.25)	0	0	1 (25)	0.482
Primary	14 (30.43)	5 (31.25)	1 (20)	2 (66.66)	1 (25)	
Middle-school	5 (10.86)	0	0	1 (33.33)	0	
High-school	7 (15.21)	1 (6.25)	2 (40)	0	0	
Diploma/Intermediate	9 (19.56)	3 (18.75)	1 (20)	0	1 (25)	
Graduate	8 (17.39)	2 (12.5)	1 (20)	0	1 (25)	
<b>Occupation</b>						
Housemaker	10 (21.73)	8 (50)	3 (60)	0	1 (25)	0.010
Retired	18 (39.13)	7 (43.75)	0	1 (33.33)	2 (50)	
Farmer/Clerk/Shop	4 (8.69)	0	2 (40)	0	0	
Daily wage worker	7 (15.21)	0	0	1 (33.33)	1 (25)	
Government servant	7 (15.21)	0	0	0	0	
Unemployed	0	1 (6.25)	0	1 (33.33)	0	
<b>Income</b>						
Nil	26 (56.52)	16 (100)	3 (60)	2 (66.66)	3 (75)	0.393
<₹5000	2 (4.34)	0	0	0	0	
₹5000-₹30,000	13 (28.26)	0	2 (40)	1 (33.33)	1 (25)	
>₹30,000	5 (10.86)	0	0	0	0	
<b>Eye treated</b>						
Right	4 (8.69)	2 (12.5)	1 (20)	0	0	0.847
Left	4 (8.69)	0	0	0	0	
Both	38 (82.60)	14 (87.5)	4 (80)	3 (100)	4 (100)	
<b>Glaucoma type</b>						
POAG	27 (58.69)	9 (56.25)	1 (20)	2 (66.66)	1 (25)	0.326
NAG	15 (32.60)	6 (37.5)	2 (40)	0	2 (50)	
Secondary	4 (8.69)	1 (6.25)	2 (40)	1 (33.33)	1 (25)	
<b>Treatment duration</b>						
<6 months	7 (15.21)	0	0	1 (33.33)	0	0.194
6 months to 1 year	9 (19.56)	2 (12.5)	0	0	0	
1-3 years	10 (21.73)	3 (18.75)	3 (60)	0	0	
>3 years	20 (43.47)	11 (68.75)	2 (40)	2 (66.66)	4 (100)	
<b>One bottle lasted for</b>						
1 week	1 (2.17)	0	0	0	0	0.381
2 weeks	7 (15.21)	3 (18.75)	1 (20)	2 (66.66)	3 (75)	
3 weeks	4 (8.69)	3 (18.75)	0	0	0	
4 weeks	31 (67.39)	10 (62.5)	3 (60)	1 (33.33)	1 (25)	
6 weeks	3 (6.52)	0	1 (20)	0	0	

Contd...

**Table 1: Contd...**

Factors	Treatment payer					P
	Self n=46 (%)	Children n=16 (%)	Spouse n=5 (%)	Government n=3 (%)	Mix n=4 (%)	
Offered surgery						
Yes	17 (36.95)	7 (43.75)	4 (80)	2 (66.66)	3 (75)	0.221
No	29 (63.04)	9 (56.25)	1 (20)	1 (33.33)	1 (25)	
Undergone surgery						
No	31 (67.39)	10 (62.5)	1 (20)	1 (33.33)	1 (25)	0.007
Peripheral iridotomy	12 (26.08)	5 (31.25)	2 (40)	0	3 (75)	
Trabeculectomy	1 (2.17)	1 (6.25)	0	1 (33.33)	0	
Both	2 (4.34)	0	2 (40)	1 (33.33)	0	
Follow-up frequency						
2 weeks	4 (8.69)	1 (6.25)	0	0	0	0.677
4 weeks	31 (67.39)	8 (50)	2 (40)	2 (66.66)	3 (75)	
8 weeks	8 (17.39)	4 (25)	3 (60)	1 (33.33)	1 (25)	
12 weeks	3 (6.52)	3 (18.75)	0	0	0	
Accompany required						
Yes	5 (10.86)	5 (31.25)	0	2 (66.66)	0	0.027
No	41 (89.13)	11 (68.75)	5 (100)	1 (33.33)	4 (100)	
Man-hours lost per visit						
Nil	27 (58.69)	16 (100)	5 (100)	2 (66.66)	3 (75)	0.016
1 day	19 (41.30)	0	0	1 (33.33)	1 (25)	
Time taken to be attended						
1 hour	22 (47.82)	6 (37.5)	2 (40)	2 (66.66)	1 (25)	0.587
2 hours	20 (43.47)	9 (56.25)	2 (40)	0	3 (75)	
2-4 hours	4 (8.69)	1 (6.25)	1 (20)	1 (33.33)	0	
Treatment impression						
Better	14 (30.43)	9 (56.25)	3 (60)	0	1 (25)	0.027
Same	28 (60.86)	4 (25)	2 (40)	1 (33.33)	3 (75)	
Worse	4 (8.69)	3 (18.75)	0	2 (66.66)	0	

with an income of ₹5000 to ₹30,000 (low-moderate) spent ₹628.82 on medicines and ₹144.11 on travelling, and patients with an income of >₹30,000 (high-income group) spent ₹536 on transport and ₹144 on medicines. This accounts for 5.17% and 1.50% of the monthly income for low-moderate and high-income group, respectively [Table 1].

It was noted that financial dependence for treatment was statistically significant when associated with factors like gender ( $P = 0.019$ ), occupation ( $P = 0.010$ ), whether having undergone surgery ( $P = 0.007$ ), whether accompany required ( $P = 0.027$ ), man-hours lost during each visit ( $P = 0.016$ ), and treatment impression ( $P = 0.027$ ). However, no statistical significance was seen when factors were associated with the total cost per month [Table 2].

## Discussion

This cross-sectional study interviewed a sample of 74 glaucoma patients to explore the economic burden of glaucoma. The study revealed that 58.11% of the participants had an expenditure strain and many were non-compliant due to the unavailability of drugs in a government pharmacy, or incapability of the patient to afford drugs from a private pharmacy. Most of the participants were retirees (37.84%), and purchasing AGM regularly was a

burden for them since they did not earn anything and had to either rely financially on others or spend money from their savings. Only 4.05% of the patients had their medical costs reimbursed from government schemes. Furthermore, a large number of participants had glaucoma for more than three years (52.70%): this must have added a substantial amount of burden over time. Therefore, this study was done to determine the financial burden of glaucoma among patients.

In a study from Nigeria by Adio *et al.*,<sup>[8]</sup> the average cost of AGM was US\$ 40 (₹2945) per month and indirect costs added another US\$105.4 (₹7762.44) per month. In a study by Rouland *et al.*<sup>[1]</sup> conducted in France, direct medical costs amounted to 45% of the total cost, direct non-medical costs were 20%, and indirect costs were 35%, which were all very considerable. Another study by Traverso *et al.*<sup>[6]</sup> found that medication costs alone ranged from 42% to 56% of the total direct cost for all stages of glaucoma; the estimated annual direct healthcare cost of glaucoma-related blindness was found to be between €429 (₹37,026.99) and €523 (₹45,140.13) per patient, and annual total costs were estimated to be between €11,758 (₹8,65,947.30) and €19,111 (₹16,49,470.41). Similarly, a study from the USA by Rein *et al.*<sup>[11]</sup> estimated that the direct medical cost was US\$16.2 billion (approx. ₹12,000 crores), other

**Table 2: Average and standard deviation of total expenditure with various factors**

Factors	Average±Standard Deviation Total expenditure (₹)	P
Age		
30-40 years	805±676.55	0.908
41-50 years	869.66±667.24	
51-60 years	888.38±699.01	
61-70 years	878.40±699.36	
71-80 years	882.74±677.82	
81-90 years	1350±0.00	
Gender		
Male	872.84±678.53	0.317
Female	890.99±685.07	
Education		
Illiterate	877.22±685.84	0.169
Primary	884.06±694.33	
Middle-school	832.77±565.66	
High-school	765.83±536.73	
Diploma/Intermediate	886.37±694.04	
Graduate	885.14±673.79	
Occupation		
Housemaker	905.08±709.41	0.927
Retired	872.84±678.53	
Farmer/Clerk/Shop	886.31±686.11	
Daily wage worker	835.17±575.58	
Government servant	826.74±600.76	
Unemployed	845.65±596.85	
Income		
Nil	872.84±678.53	0.490
<₹5000	996.51±800.63	
₹5000-₹30,000	891.94±676.53	
>₹30,000	736.81±438.89	
Eye treated		
Right	880.17±733.88	0.619
Left	929.35±771.76	
Both	872.84±678.53	
Glaucoma type		
POAG	878.90±681.21	0.256
NAG	884.58±682.40	
Secondary	889.02±749.99	
Treatment duration		
<6 months	900.48±691.72	0.849
6 months to 1 year	897.21±727.61	
1-3 years	875.86±694.60	
>3 years	882.74±677.83	
Treatment payment		
Self	882.74±677.83	0.928
Children	877.22±685.83	
Spouse	951.56±768.79	
Government	880±589.00	
Mix	654±431.72	

**Table 2: Contd...**

Factors	Average±Standard Deviation Total expenditure (₹)	P
One bottle lasted for		
1 week	1000±00	0.739
2 weeks	882.41±740.08	
3 weeks	878.90±681.21	
4 weeks	882.74±677.83	
6 weeks	1031.17±905.43	
Offered surgery		
Yes	872.84±678.53	0.589
No	880.72±670.54	
Undergone surgery		
No	878.90±681.21	0.343
Peripheral iridotomy	882.74±677.83	
Trabeculectomy	868.62±721.37	
Both	951.56±768.79	
Follow-up frequency		
2 weeks	888±754.84	0.073
4 weeks	882.74±677.83	
8 weeks	891.94±676.53	
12 weeks	881.72±716.47	
Accompany required		
Yes	869.71±674.79	0.404
No	872.84±678.53	
Man-hours lost per visit		
Nil	872.84±678.53	0.838
1 day	903.71±693.47	
Time taken to be attended		
1 hour	872.84±678.53	0.633
2 hours	869.71±674.79	
2-4 hours	962.79±778.97	
Treatment impression		
Better	872.84±678.53	0.396
Same	890.98±685.07	
Worse	905.32±693.81	

direct cost was US\$11.1 billion (approx. ₹8000 crores), and total financial burden on adults was US\$35.4 billion (approx. ₹26,000 crores) annually. In our study, an average person spent an average amount of ₹8,028 on direct medical costs and ₹2,436 on indirect costs with an average total cost of ₹10,464 annually. This amount can be immense for a patient who has no income and is dependent on others for their expenses, which necessitates cost-effective management of the disease. The average total cost ranged from 6.57% to 76.68% of the monthly income of the lower-income group patients. Therefore, the choice of treatment—whether surgical or medical—needs to be individualized.

In a study, Varma *et al.*<sup>[12]</sup> reported that treatment of glaucoma was very cost-effective when the costs related to diagnostic assessment were excluded. In our hospital, patients were not charged for diagnostic tests. The approximate rates in private hospitals at the time of the study were ₹1500 for visual

Contd...

field testing, ₹1200 for applanation tonometry, ₹3000 for optical coherence tomography (OCT), and a consultation fee of ₹400 per visit. If the cost of investigations was included, it would have further escalated the expenditure strain on the patients. Since no amount was charged, the strain of direct costs was reduced by a large amount.

In our study, the most commonly used drugs were prostaglandin analogs (34%) as they are more effective in lowering IOP. A single drug was used by 46 participants and 18% used a combination drug. In a study by Nayak *et al.*<sup>[13]</sup> a single medication was being used by 30.7% of patients, of which beta blockers were used in two-thirds and prostaglandin analogs in about a third. In another study conducted in Nigeria, patients were mainly on topical beta blockers (93.3%).<sup>[8]</sup> The average cost of beta blockers in India is ₹60 per 5 ml bottle and that of pilocarpine is ₹50 per 5 ml bottle. Patients from the lower economy group could be advised to use these drugs, if not contraindicated. Also, a cheaper alternative to other drugs can be prescribed to patients. Thirty-seven point eight four percent of patients reported using more than two drugs: these patients can benefit from a suitable cost-effective combination drug. Additionally, certain drugs can be made available in government pharmacies or private pharmacies at a subsidized rate within the access of poor patients from distant areas. Our study reported that 54.05% of the patients had systemic illnesses that added to existing economic crises.

In a study done by Ramesh *et al.*,<sup>[5]</sup> 41.4% of non-compliant patients had an expenditure strain. In another study by Tripathi *et al.*,<sup>[14]</sup> 19.2% of patients were non-compliant due to the cost factor. An Ethiopian study by Tamrat *et al.*<sup>[10]</sup> mentioned that 74.4% of patients who had financial problems in obtaining medications were non-adherent as compared to 36.1% of patients who had no financial problem. In our study, about 39% of the patients were non-compliant with topical AGM, out of which 28% had cost factor as their main reason for non-compliance. Nayak *et al.*<sup>[13]</sup> stated that highly educated patients had a better understanding of the disease and were more compliant (100%) in comparison to the less educated group (88.2%). Our study agrees with the above study, with compliance among graduates being 100%. Hence, it is important to make patients aware of risk factors and educate them about the importance of instilling drops timely and in an accurate way. This will encourage compliance and thus help in avoiding frequent follow-up visits or the use of expensive drugs which have a higher cost and are not affordable for the average glaucoma patient.

In a Nigerian study, none of the participants had taken up the option of surgery, although 13.3% of subjects reported being offered surgery as an alternative and the cost of surgery in the hospital at the time of the study was ₦30,000 (₹5471.23).<sup>[8]</sup> In a study by Traverso *et al.*,<sup>[6]</sup> laser trabeculoplasty was performed mostly in the early stages, while trabeculectomy was common in more advanced stages. In our study, 44.59% of the participants were offered surgery and 40.54% had undergone it. The average cost of surgery in a private hospital is ₹18,000. Residents of the state undergo the surgery for free in a government hospital while others have to pay an amount of ₹2000–₹3000. Therefore, considering the long-term benefits surgical options could be provided as a first-line treatment for suitable patients.

Anand *et al.*<sup>[15]</sup> concluded a reasonable acceptance of early surgery in 65% of POAG patients in the developing world

and this improved on educating patients about their disease. A study by Varma *et al.*<sup>[12]</sup> showed that early identification and treatment of patients with glaucoma and those with ocular hypertension at a high risk of vision loss may possibly reduce an individual's loss of health-related quality of life as well as curtail personal and societal economic burdens. Increasing awareness by organizing glaucoma education programs and glaucoma screening camps for high-risk populations and those having positive family history can ensure early diagnosis of the disease. Early identification and treatment can limit the visual impairment which in turn will reduce dependence and help avoid frequent follow-up visits, additional medications, and diagnostic tests: this will mitigate the economic burden.

Therefore, the economic burden associated with glaucoma is quite significant and priority needs to be placed on increasing awareness and develop cost-effective treatment regimens that are practical to reduce the financial burden of patients and society as a whole.

## Conclusion

Low-income earners and middle-income earners spent 26.08% and 5.17% of their monthly income on glaucoma treatment, respectively. The economic burden of glaucoma on patients is highly considerable, and treatment should be individualized according to the socioeconomic status of each patient. Cheaper alternatives of AGM available in the vicinity of the patient should be advised, if suitable. Also, the frequency of follow-up visits can be reduced in compliant patients with slowly progressing disease which will reduce indirect costs of travel, food, etc., Individuals diagnosed with glaucoma who are non-compliant with medical treatment due to financial reasons should be advised to undergo surgery as a first-line treatment. Educating the patient about the disease, making them aware of its side effects, and explaining the importance of instilling drugs on time and in the correct way can aid compliance. Increasing awareness by organizing glaucoma education programs and glaucoma screening camps for high-risk populations and those having positive family history can ensure early diagnosis of the disease. Early identification and treatment can limit visual impairment and help avoid frequent follow-up visits and additional medicinal and diagnostic costs. Free camps in remote places will be beneficial for poor people who cannot afford to travel to places with better health facilities.

Hence, managing glaucoma efficiently and delaying disease progression would help significantly reduce the economic burden of this disease.

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## Conflicts of interest

There are no conflicts of interest.

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