

BEYOND BLINDNESS : OCULAR CAUSES AND PATTERNS OF VISUAL DISABILITY CERTIFICATION IN A TERTIARY CARE CENTRE

Ophthalmology

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ABSTRACT

Purpose: To evaluate the spectrum of ocular diseases causing visual impairment among patients applying for disability certification at a tertiary care centre in Central India and classify them by etiology, age group, preventability, and disability grade. **Methods:** This hospital-based cross-sectional study was conducted over two years at a tertiary care centre in Nagpur. A total of 275 patients seeking visual disability certification were enrolled. All underwent comprehensive ophthalmic evaluation including visual acuity assessment, best-corrected visual acuity, slit-lamp examination, intraocular pressure measurement, and dilated fundus examination. Disability percentage was calculated according to the RPwD Act 2016 and Gazette of India 2018 guidelines. Data were analysed using SPSS version 31.0. **Results:** Among 275 patients, 168 (61.1%) were males and 107 (38.9%) females, with a mean age of 37.9 ± 16.8 years. Optic atrophy was the most common cause of visual disability (18.9%), followed by amblyopia (14.9%), corneal diseases (14.2%), phthisis bulbi (11.3%), and retinitis pigmentosa (10.2%). Congenital causes accounted for 50.5% of cases and acquired causes for 49.5%. Total blindness (100% disability) was observed in 86 patients (31.1%). Overall, 74.5% qualified for statutory benefits under the RPwD Act, while approximately 29% had avoidable causes of visual impairment. **Conclusion:** Optic atrophy and amblyopia were the leading causes of visual disability certification. Although most conditions were irreversible, nearly one-third were potentially avoidable, highlighting the need for early detection, timely treatment, and preventive eye care strategies.

KEYWORDS

Visual Disability, Certification, Visual Impairment, Blindness, Rpwd Act.

INTRODUCTION

Visual impairment remains a major public health problem worldwide. The Global Burden of Diseases (GBD) 2020 report estimated that around 43.3 million people are blind and 295 million have moderate to severe visual impairment globally (GBD 2020 Blindness and Vision Impairment Collaborators, 2021).

In India, the National Blindness and Visual Impairment Survey 2015-2019 reported a blindness prevalence of 1.99% among those aged 50 years and above, with cataract being the leading cause (Ministry Of Health and Family Welfare, Government of India, 2019).

Under the Rights of Persons with Disabilities (RPwD) Act 2016, individuals with significant visual disability are entitled to formal certification, which enables access to government welfare benefits, reservations in education and employment, and assistive devices. Because patients with operable cataract are excluded from certification and sent for surgery instead, people who come for disability certification tend to have diseases that are either irreversible or progressive. This makes them a distinct group from those captured in community-based blindness surveys (Ministry of Social Justice and Empowerment, 2018).

Published data on the causes of visual disability in people presenting for certification are relatively limited, particularly from Central India. Previous studies from other regions have identified retinal diseases, optic atrophy, amblyopia and congenital anomalies as leading causes, but the pattern varies considerably by region (Ambastha et al., 2019; Khan et al., 2020; Sadanand et al., 2024; Agrawal et al., 2025).

The present study aimed to evaluate the spectrum of ocular diseases causing visual impairment, the distribution of visual disability, and the proportion of avoidable causes, among patients applying for blindness certification at a tertiary care centre in Central India.

MATERIAL AND METHODS

Study Design

A hospital-based cross-sectional study conducted in the Department of Ophthalmology, Government Medical College and Hospital (GMCH), Nagpur, Maharashtra, India over the two year period from 2023 to 2025.

Study Population

A total of 275 consecutive patients applying for blindness or visual disability certification were included in the study.

Inclusion Criteria

Patients of all age groups applying for blindness or visual disability certification who provided informed consent (or guardian provided consent for minors) were included.

Exclusion Criteria

Patients with operable cataract as the primary cause of visual impairment (who were referred for cataract surgery), those with other immediately treatable causes such as operable retinal detachment or significant refractive error without amblyopia, and those unwilling to participate were excluded.

Ophthalmic Evaluation

All participants underwent a comprehensive ophthalmic evaluation including uncorrected visual acuity, best corrected visual acuity (BCVA) using a Snellen's chart at 6 metre distance, slit lamp biomicroscopy intraocular pressure measurement by non contact tonometry and dilated posterior segment examination by direct and indirect ophthalmoscopy. Additional investigations like optical coherence tomography, automated perimetry, b-scan ultrasonography, and visually evoked potential were done when needed.

Visual Disability Assessment

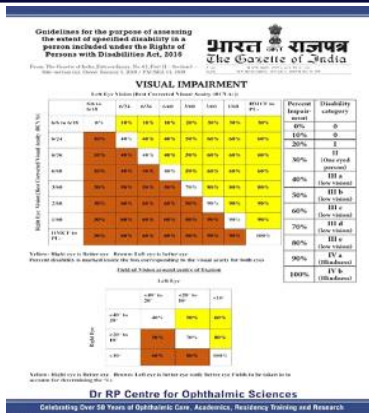
Visual disability was assessed according to Rights of Persons with Disabilities Act 2016 and Gazette of India, Guidelines for Evaluation of Permanent Physical Impairment (Ministry of Social Justice and Empowerment, 2018).

Disability was categorised from category 0 (0 to 10%) to category 4b (100%) based on BCVA and visual field assessment. When different diagnoses were present in the two eyes, the diagnosis contributing most to the overall visual disability was considered the primary diagnosis.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using SPSS version 31.0. Descriptive statistics, chi square test, and one-way ANOVA were applied. A P value less than 0.05 was considered statistically significant.

Figure shows visual impairment disability percentage chart as per RPwD Act 2016 (Gazette of India 2018); Courtesy : Dr R.P Centre for Ophthalmic Sciences, AIIMS, Delhi



RESULTS

A total of 275 patients were enrolled in the study. Of these, 176 (64.0%) received permanent disability certification and 99 (36.0%) received temporary certification.

Demographics: Among the participants, 168 (61.6%) were males and 107 (38.9%) were females; (male to female ratio 1.6:1). The gender distribution was statistically significant ($\chi^2 = 8.76, p = 0.003$).

The mean age was 37.9 ± 16.8 years. The 31 to 40 year age group constituted the largest proportion (67 patients; 24.4%) followed by 51 to 60 years (19.3%) and 41 to 50 years (17.8%) age groups. No significant difference in age distribution was observed ($p > 0.05$).

Laterality and Clinical history: Bilateral involvement was observed in 187 patients (68.0%), while 43 (15.6%) had right eye involvement and 44 (16.0%) with left eye involvement. A positive family history was by 40 patients (14.5%); 49 (17.8%) reported a history of ocular trauma.

Aetiology. Congenital causes accounted for 139 patients (50.5%) while 136 patients (49.5%) had acquired ocular causes.

A significant association was observed between gender and disease aetiology ($\chi^2 = 4.749, p = 0.029$), with congenital occurring relatively more frequently among females.

Spectrum of diseases: Sixteen diagnostic categories were identified across 275 patients. The five leading causes were optic atrophy or nerve disease (18.9%), amblyopia (14.9%), corneal disease (14.2%), phthisis or atrophic bulbi (11.3%), and retinitis pigmentosa and congenital ocular anomalies (10.2% each). The complete distribution, stratified by aetiology and permanence, is shown in Table 1.

Diagnosis	n (%)	Acquired (n)	Congenital (n)	Permanent (n)	Temporary (n)
Optic Atrophy / Nerve Disease	52 (18.9%)	36	16	38	14
Amblyopia	41 (14.9%)	12	29	13	28
Corneal Disease	39 (14.2%)	32	7	22	17
Phthisis / Atrophic Bulbi	31 (11.3%)	30	1	20	11
Retinitis Pigmentosa	28 (10.2%)	2	26	27	1
Congenital Ocular Anomalies	28 (10.2%)	0	28	18	10
Macular Disease	19 (6.9%)	2	17	19	0
Cortical / Neurological	6 (2.2%)	5	1	5	1
High Myopia	5 (1.8%)	1	4	2	3

Retinal Detachment	4 (1.5%)	3	1	4	0
Chorioretinitis / Uveitis	3 (1.1%)	2	1	2	1
Glaucoma	2 (0.7%)	1	1	1	1
Albinism	2 (0.7%)	0	2	1	1
Other Causes	15 (5.5%)	8	7	4	11
Total	275 (100%)	136	139	176	99

Age-wise disease distribution: Amblyopia was most common in the 21–40 years group, whereas optic atrophy predominated in aged >40 years. Congenital anomalies were concentrated in patients aged 0–20 years, while retinitis pigmentosa was more frequently diagnosed during adulthood. The age wise distribution is shown in Table 2

Diagnosis	0–20 yrs (n=45)	21–40 yrs (n=105)	41–60 yrs (n=102)	>60 yrs (n=23)	Total
Optic Atrophy / Nerve Disease	6	17	23	6	52
Amblyopia	9	25	7	—	41
Corneal Disease	9	10	17	3	39
Phthisis / Atrophic Bulbi	1	12	14	4	31
Retinitis Pigmentosa	1	12	11	4	28
Macular Disease	4	7	7	1	19
Congenital Ocular Anomalies	9	9	8	2	28
Others	6	13	15	3	37
Total	45	105	102	23	275

Disability distribution: The largest proportion of patients had either 30% or 40% disability (102 patients, 37.1%), followed by 100% disability (86 patients, 31.3%)

Overall, 109 patients (39.6%) had blindness (>90% disability), and 205 patients (74.5%) qualified for statutory benefits under RPwD Act (>=40% disability). The detailed distribution is presented in Table 3

Disability %	RPwD Category	Visual Status	Male (n)	Female (n)	Total (n)	Total (%)
0–10%	0	No disability	2	1	3	1.1%
20%	I	Mild impairment	2	2	4	1.5%
30%	II	One-eyed person	41	21	62	22.5%
40%	IIIa	Low vision	21	19	40	14.5%
50%	IIIb	Low vision	4	3	7	2.5%
60%	IIIc	Low vision	19	11	30	10.9%
70%	IIId	Low vision	4	10	14	5.1%
80%	IIIe	Low vision	5	1	6	2.2%
90%	IVa	Blindness	17	6	23	8.4%
100%	IVb	Total	53	33	86	31.3%
Total	—	—	168	107	275	100%

Disease–disability relationship: Optic atrophy, retinitis pigmentosa, macular disease, and congenital anomalies were most frequently associated with 100% disability. Amblyopia predominantly resulted in 40% disability, whereas corneal disease and phthisis bulbi were most commonly associated with 30% disability, reflecting predominantly unilateral visual impairment.

Avoidable vs non-avoidable causes: Avoidable causes, primarily corneal disease, amblyopia, and glaucoma accounted for 80 patients (29.1%). The remaining 195 patients (70.9%) had non-avoidable causes, including hereditary retinal dystrophies, congenital anomalies, and advanced optic atrophy.

DISCUSSION

The present study evaluates the spectrum of ocular diseases among

275 applicants at a tertiary center in Central India. Optic atrophy or nerve disease was the leading cause (18.9%), of certified visual disability, followed by amblyopia (14.9%) and corneal diseases (14.2%). This pattern differs from that reported in several previous Indian studies and reflects differences in referral patterns, patient demographics and regional disease profile.

The predominance of male patients (61.6%) is comparable to that reported by Sadanand et al (2024) and Khan et al (2020). This finding may be attributed to greater occupational exposure to ocular trauma and better utilization of disability certification among men. The highest proportion belonged to 31 to 40 year age group, indicating that visual disability predominantly affects individual during their economically productive years.

Unlike previous studies in which retinitis pigmentosa, macular diseases or phthisis bulbi were the leading causes of visual disability, optic atrophy was the most frequent diagnosis in the present study (Ambastha et al., 2019; Khan et al., 2020; Sadanand et al., 2024). The difference may be explained by the tertiary referral pattern of our institution, which receives a large number of patients with advanced optic nerve and neuro-ophthalmic disorders. Amblyopia was the second most common diagnosis and represented the leading avoidable cause of visual disability. Despite being largely preventable through early detection and treatment, it continues to contribute substantially to permanent visual disability highlighting the need for effective childhood vision screening programmes.

Corneal diseases and phthisis bulbi accounted for approximately 1/4 of all cases and reflected the burden of ocular trauma and infectious keratitis. The proportion of patients with a history of ocular trauma 17.8% further emphasizes the importance of preventive strategies including workplace eye protection, early management of corneal infections and awareness regarding the ocular injuries. Retinitis pigmentosa and congenital ocular anomalies together constituted 1/5 of all cases and were associated with 100% disability, emphasizing the importance of genetic counselling, low vision rehabilitation and long term visual rehabilitation services. Approximately 29.1% of visual disability in the present study resulted from avoidable causes, whereas majority of the cases were attributable to irreversible disorders. These findings indicate a substantial proportion of visual disability could potentially be prevented through timely diagnosis and appropriate management of treatable ocular diseases.

CONCLUSION

Optic atrophy, amblyopia, and corneal disease are the three most common causes of certified visual disability in this tertiary centre study. Although most cases were attributable to irreversible disorders, 29.1% resulted from avoidable causes, emphasizing the importance of childhood vision screening, ocular trauma prevention, timely management of corneal diseases, and appropriate rehabilitation services. These findings provide regional evidence that may assist in planning preventive strategies and resource allocation for visual disability services.

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