Clinical profile of adults with permanent visual impairment presenting to the Government tertiary care hospital In India

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Abstract

Purpose: To evaluate the causes of visual impairment in adults attending our Government tertiary care hospital, in India for the purpose of blindness disability certification to aid in better planning and prevention of blindness activities in India.

Methods: The study was a non-interventional cross-sectional record-based analysis on 411 adults with permanent visual impairment attending Ophthalmologyout patient department of Mandya Institute of Medical Sciences, Mandya, India for blindness disability certification during July 2019 to Dec 2020. Patients demographic data, educational background, need for disability certification and area of residence all noted after complete ocular examination and categorised depending on the etiology and percentage of visual impairment. Groups analyses and $P<0.05$ was taken as level of statistical significance.

Results: Of the 411 subjects, 65.2% were males and the majority >53% were in the 18-39 years age group. Overall, most frequent cause of permanent visual impairment was congenital anomalies (17.7%) and retinitis pigmentosa (17.03%). However, age group based data showed a trauma (59.09%) was the most common cause for 30% visual impairment (one eyed). Most common causes for ‘low vision’

and 'blindness' in the study group was amblyopia (19.01%) and Congenital anomalies (29.9%) respectively.

Conclusion: Congenital anomalies and retinitis pigmentosa were common cause of visual impairment in our study, hence proper genetic counselling to expectant mothers can mitigate these. Early & timely regular school screening activities by authorities can help control the incidence of amblyopia and high refractive errors. Policymakers should at regular intervals form consensus based on disability data to better manage and empower the blind and mitigate the prevalence of ocular morbidity.

Keywords: Blindness, disability, congenital anomalies, retinitis pigmentosa

INTRODUCTION

Visual deficits due to any cause can hamper social, psychological and emotional wellbeing of an individual.[1]According to the National Sample Survey Organization(NSSO) approximately 12 million people in India, currently have some form of blindness. Census data of India 2001, shows the prevalence of totally blind due to permanent blindness in India to be 156 per lakh population, and those suffering from low vision to be 61 per lakh population.[2]

Visual morbidity has tremendous consequences on the individual and the society in general, especially in a developing economy like ours.[1,3]In-order to mitigate this, visual disability certification is an important social and economic insurance measure taken up by the Ministry of Social Justice and Empowerment, to provide rehabilitation and vocational opportunities for the visually impaired in India. Visual disability certificates are issued to only those who have a disability percentage of ≥40% as defined by the Gazette of India.[4]

In India, identification of the causes of visual morbidity is of paramount importance to assist in planning of national and social blindness prevention schemes, however most of the data accrued is from the voluntary registration of the blind and blindness registers of various institutes which issue blindness disability certificates for the purposes of employment, education and economic support.[5]Due to the voluntary registration process of the blind, there is under-reporting especially in rural parts of India leading to missed cases and also data regarding the cause of visual impairment in patients with less than 40% visual handicap is missed out from our blindness registers which impacts the planning and prevention of blindness activities in the state and the country.[4,5]

Studies evaluating the clinical profile of patients suffering from permanent visual impairment are far and few in the state of Karnataka, India. Hence in our current study we aim to assess and evaluate the causes of visual impairment in patients attending our institution for the purpose of blindness disability certification to aid in better planning and prevention of blindness activities in India.

METHODS

The current analysis was a non-interventional, cross-sectional recordbasedstudy on 411 patients who attended Ophthalmology out-patient department (OPD) of Government tertiary care institute-Mandya Institute of Medical Sciences, Mandya, India, for the purpose of Blindness Disability Certification from July 2019 to Dec 2020. The study was conducted after due clearance from the institutional ethical committee clearance. The study conformed to all the tenets of the declaration of Helsinki.Purposive sampling method was used and 411 subjects were included as study subjects.[6]All adults/subjects aged above 18 years, having permanent visual impairment, visiting the OPD of our institute for the purpose of disability certification

were included in the study. However, those with avoidable/treatable causes of decreased vision at presentation such as cataract, correctable refractive errors and records with incomplete data were excluded from the study.

A complete history, demographic data, educational status, residenceand cause for visual impairment was noted. Patientsdistant visual acuity after best possible correction in eye/eyes recorded. Complete ocular examination by slit lamp bio-microscopy, fundus examination by +90D and indirect ophthalmoscopy was done if required and observations noted. Findings of special investigations like B scan, Visual Evoked Potential, Optical Coherence Tomography, Visual fields if needed were also noted. Definitions of Visual impairment, Low vision and Blindness were set according to set criteria of Gazette of India as described below.[4,7]

Visual impairment was defined according to the criteria set by the Gazette of India, as distance visual acuity less than 6/18 or visual field loss by predefined standardized conservative criteria in the better eye. "Low-vision" defined as visual acuity not exceeding 6/18 or upto 3/60 or in the better eye with best possible corrections or limitation of the field of vision subtending an angle of less than 40 degree up to 10 degree. "Blindness" means a condition where a person has visual acuity less than 3/60 in the better eye with best possible correction or limitation of the field of vision subtending an angle of less than 10 degree.[4,7]

Percentage of visual impairment was calculated, based on current guidelines for the evaluation of various disabilities and the procedure for certificationas described in table 1. [4,7]

Table 1. Current guidelines for the evaluation of visual disabilities and the procedure for certification

Better eye Best Corrected	Worse eye Best corrected	Percent Impairment	Disability category
6/6 to 6/18	6/6 to 6/18	0%	0
	6/24 to 6/60	10%	0
	Less than 6/60 to 3/60	20%	1
	Less than 3/60 No Light Perception	30%	II (One eyed person)
6/24 to 6/60 Or Visual field less than 40 up to 20 degree around centre of fixation or hemianopia involving macula	6/24 to 6/60	40%	III a (low vision)
	Less than 6/60 to 3/60	50%	III b (low vision)
	Less than 3/60 to No Light Perception	60%	III c (low vision)
Less than 6/60 to 3/60 Or Visual filed less than 20 up to 10 degree around centre of fixation	Less than 6/60 to 3/60	70%	III d (low vision)
	Less than 3/60 to No Light Perception	80%	III e (low vision)
Less than 3/60 to 1/60 Or Visual field less than 10 degree around centre of fixation	Less than 3/60 to No Light Perception	90%	IV a (Blindness)
Only HMCF OnlyLight Perception No Light Perception	Only HMCF Only Light Perception No Light Perception	100%	IV b (Blindness)

CF- Finger counting, HMCF- Hand movement close to face

Statistical analysis

Analysis was done using descriptive statistics in the form of percentages, mean and standard deviation. Continuous variables were analysed using 'one sample goodness‐of‐ fit test'. All the recorded data werestatistically analysed by IBM SPSS Statistics version 21 (IBM Corp., Armonk, N.Y., USA).[8]For statistical significance, *p* value <0.05 was considered.

RESULTS

Of the 411 subjects who were part of the study, 268 were males and 143 females. The age of the study population ranged from 18 to 70 years, with a mean of 36.31±15.86 years. Majority of the study population were in the age group of 18-39 years accounting for 53.28% of cases. More than 55.76% of the population who came to avail the services of disability certification were from the rural areas, and there was a direct statistical relevance to the educational status and the ocular disability. Approximately 60.32% of the subjects who came to avail the certification had not received any formal school education or dropped out during early childhood and belonged to a lower economic strata as classified under the Kuppuswamy classification.[9]

In our current study the purpose of availing disability certification was highest for reasons of financial benefits, followed by travel allowance, educational benefits and medical issues respectively. However, the most common age group who availed the services were among the 18-39 age group, followed by 40-59 years age group as depicted in figure 1.

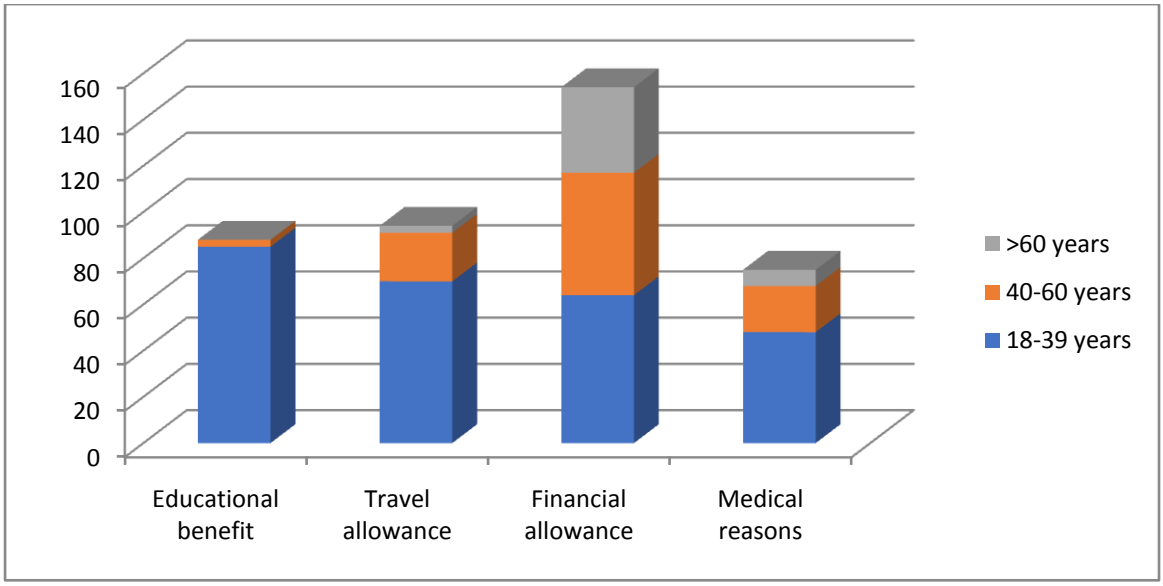

Figure 1: Reasons for availing disability certification in all age groups

Out of the 411 study subjects, 204 (49.63%) were categorized as 'blind' (with more than 80% visual impairment), 163(39.65%) were categorised as 'low vision' (40-80% visual impairment) and 44 (10.7%) were 'one eyed' (30% visual impairment). Overall, the most common cause for visual impairment noticed in our study was congenital anomalies (17.7%), followed by retinitis pigmentosa (17.03%)**.**Retinitis pigmentosa was the most common cause of visual impairment in the age group of 18-39 years(*p* value <0.05), however in the 40 to 59 years age group, congenital anomalies were the most common. The values were statistically significant as observed in table 2 with $p<0.05$.

Table 2: Age wise distribution of the aetiology of visually impairment in our study

Etiology	**Age group (years)**			**Total n (%)**
	18-39	**40-59**	**≥60**	
Congenital anomalies	37	28	8	73 (17.7%)
Retinitis pigmentosa	42	24	4	70 (17.03%)
Amblyopia	31	12	0	43 (10.4%)
Macular pathology	25	8	2	35 (8.5%)

Trauma	25	5	3	33 (8.02%)
Pathological myopia	20	12	0	32 (7.7%)
Glaucoma	2	20	8	30 (7.29%)
Optic atrophy	20	8	0	28 (6.81%)
Corneal scar	6	11	6	23 (5.59%)
Diabetic retinopathy	4	8	6	18 (4.37%)
Complicated pseudophakia	0	7	6	13 (3.16%)
Retinal detachment	6	4	0	10 (2.43%)
Chronic uveitis	1	2	0	3 (0.72%)
Total	219 (53.28%)	149 (36.25%)	43 (10.46%)	411
P value	0.00*	0.00*	0.50	0.00*

** $p<0.05$ statistically significant*

On further analysis of the aetiology of blindness among ‘blind’, ‘low vision’ and ‘one eyed’ in various age groups the most common cause for 30% visual impairment (one eyed) was trauma (59.09%)($p<0.05$)* which was more commonly seen in the age group of 18-39 years (45.4%) and the majority of them were of male gender accounting for 14 patients. In the age group of 40-59 years and above 60 years, the common cause for being one eyed or 30% visual impairment was, complicated cataract surgery/pseudophakia and glaucoma accounting for 15.9% and 11.36% cases respectively as depicted in figure 2.

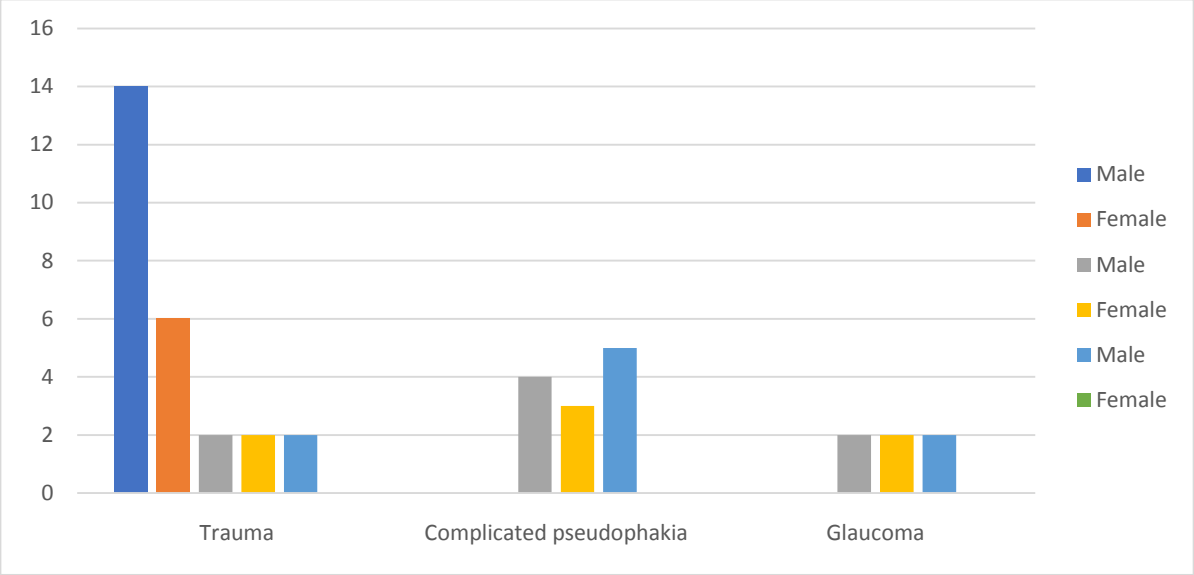

Figure 2: Age and sex distribution for causes of 'one eyed' (30% visual impairment)

Most common causes for 'low vision' (40% to 80% visual impairment) in the study group was amblyopia (19.01%)($p<0.05$), followed by pathological myopia (17.17%) ($p<0.05$) and macular pathology (13.49%). Most of the study subjects having 'low vision' were in the age group of 18-39 years as observed in figure 3.

Out of the 204 participants who were categorized as 'blind' in our study, Congenital anomalies accounted for 29.9%($p<0.05$) of patients, followed by retinitis pigmentosa observed among 25.49%($p<0.05$) subjects across all the age groups. A majority of the patients classified as 'blind' or had visual impairment more than 80% were found in the 18-39 year age group as depicted in figure 4.

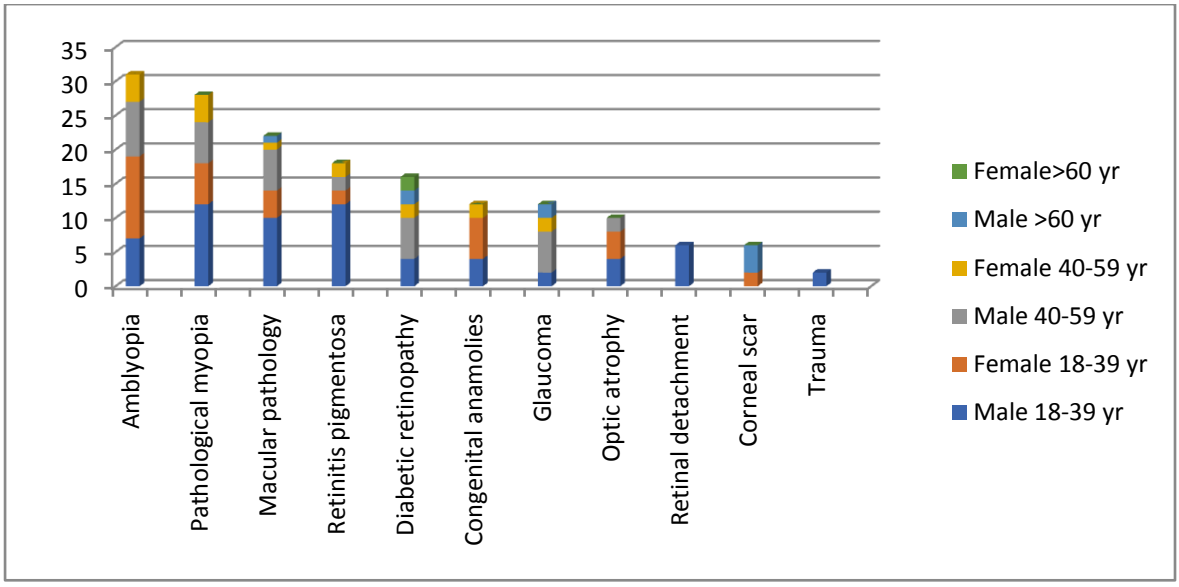

Figure 3: Age and sex distribution for causes of 'low vision' (40-80% visual impairment)

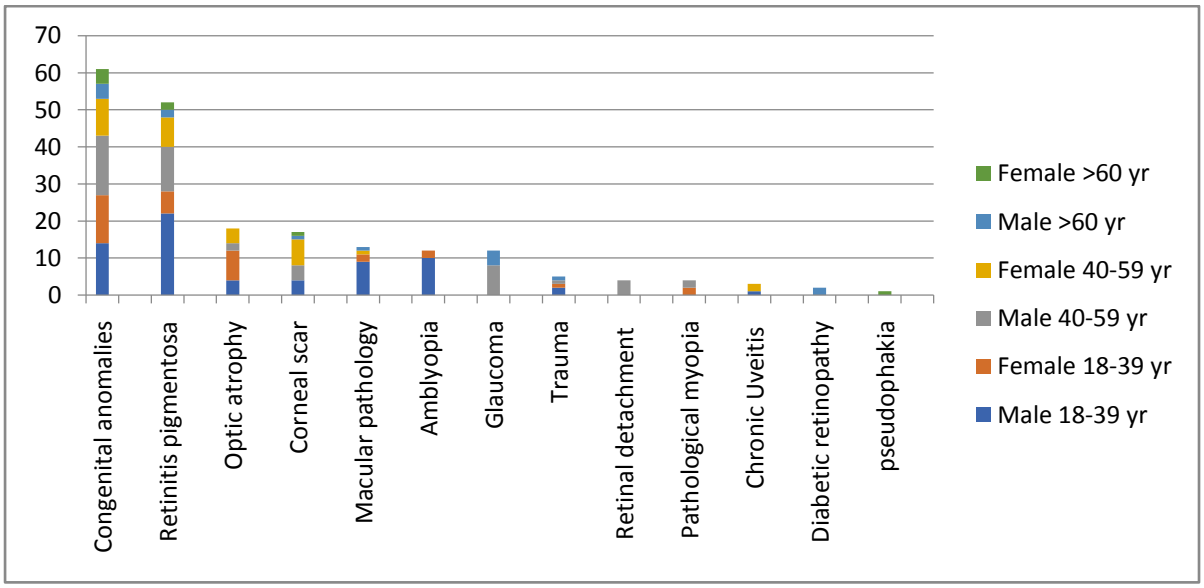

Figure 4: Age and sex distribution for causes of 'blind' (> 80% visual impairment)

DISCUSSION

Blindness Disability certification is a social and economic insurance measure for the underprivileged visually impaired of our society. Blindness registers, National blindness surveys and voluntary registration of the blind, although are efficient measures to assess the patterns and aetiology of visual impairment in the society, a

lot of data is missed especially of those patients with visual impairment less that 40 percent, as per the criteria set by the Ministry of social justice and empowerment.[4,7]

According to the data accrued from our study, the majority of the subjects seeking blindness disability certification were males between the age group of 18 to 60 years for financial & employment allowance, travel allowance and for availing educational benefits. The study findings were in line with the analysis conducted in 2013 in Maharashtra by *Joshi et al* [10] wherein the reasons for availing this social scheme was primarily seen in males for education, employment and financial reasons in the same order. Similarly, the study findings of a higher proportion of males seeking disability certification were observed in *Ghosh et al*[11]and *Kareemsab et al* [12], probably due to the social obstacles for females and long held beliefs of males as bread winners and more accessibility of social services and employment opportunities in our society still prevalent in our country.

Overall, the most common cause for visual impairment in our analysis was congenital anomalies followed by retinitis pigmentosa. Our observations were consistent with the study findings of *Kareemsab et al*[12] wherein congenital anomalies (22.05%), refractive errors (19.85%), and retinitis pigmentosa (18.01%) were common similar to that of the *Titiyal et al* [13] study and *Ambastha et al*[14] study who opined that congenital anomalies due to macular scar was the most prevalent cause of visual disability. In a similar study by *Ghosh et al* [11], phthisis bulbi followed by congenital anomalies like microphthalmos was the most frequent occurrence. Our study findings contrasted to that of the western studies wherein ARMD (age related macular degeneration) was the commonest cause of visual disability as observed in the *Avisar et al* [15]and *Bunce et al* [16] study.

The most frequent cause of visual impairment less than 40 percent (one eyed) who were not eligible for disability certification was ocular trauma especially among young males 18-39 years, probably due to outdoor activities for the purpose of employment. However, our study findings were not in line with that of *Ambastha et al* [14] study in Bihar, who opined that the most common cause of visual impairment of less than 40 percent was amblyopia. The high ocular morbidity observed in our study due to trauma can be mitigated by imparting occupational safety and education standards to all workers at their work space.

In patients with 'low vision' (40% to 80% visual handicap), amblyopia, pathological myopia and macular pathology were the commonest causes in our study in the 18 to 39 year age group. Amblyopia and pathological myopia leading to visual handicap can be easily tackled by maintaining timely quality school screening activities and providing spectacle and low vision aid services in educational institutes similar to as suggested by the *Ambastha et*al [14] and Ghosh et al [11]study.

In those with > 80 percent visual disability or 'blind', who approached to avail disability certification was due to congenital anomalies and retinitis pigmentosa in the early age group, whereas in the beyond 60year age group complicated pseudophakia & glaucoma was the most common cause in our population, whereas Bunce et al [16] study opined that ARMD was the commonest cause of visual disability in the western population. However Indian studies like Ghosh et al [11] and Titiyal et al [13]back our study results.

LIMITATIONS OF THE STUDY:A larger sample size which included all the institutions in our region would provide a better representative sample than the one available in our study.

CONCLUSION

Congenital anomalies and retinitis pigmentosa were the most common cause of permanent visual impairmentin our study, hence proper genetic counselling to expectant mothers and education regarding eye care in the neonatal age group can mitigate the incidence of increased ocular morbidity. Early & timely regular school screening activities by authorities can help control the incidence of amblyopia and high refractive errors causing low vision in the younger age group to improve their social, economic and emotional wellbeing. Improve the standards of cataract surgeries by providing good training facilities and infrastructure for ophthalmologists to minimise the chances of complicated pseudophakia. Policymakers should set occupational safety standards and create safe working conditions at all work stations. Authorities need to relook at the causes of ocular morbidity at regular intervals and form consensus to better manage and empower the blind and mitigate the prevalence of ocular morbidity in the country.

Conflict of interest- Nil

Financial interest - Nil

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