

PREVENTABLE BLINDNESS AMONGST PERSONS WITH CERTIFIED VISUAL IMPAIRMENT IN TRIBAL DISTRICT OF CENTRAL INDIA

Dhuwadhapare Pravinkumar Gangadhar¹, Raut Nandkishor G.², Sute Supriya³

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Corresponding Author:
Dr. Dhuwadhapare Pravinkumar Gangadhar,
Email: pravindhuwadhapare@gmail.com

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¹Assistant Professor, Department of Ophthalmology, Government Medical College, KTS Hospital Campus, Nehru Chawk, Near Indira Gandhi stadium, Gondia, Pin- 441601. Maharashtra, India.

²Professor, Department of Ophthalmology, Government Medical College, Gondia, Maharashtra, India.

³Senior Resident, Department of Ophthalmology, All India Institute of Medical Sciences, Nagpur, Maharashtra, India.

Abstract

Background: Visual impairment is a significant health problem affecting the common man worldwide. Among the common causes of visual impairment mentioned in the literatures, majority are easily treatable causes like uncorrected refractive error & cataract. Various literatures and articles are based on population based studies and hence the data largely involves treatable causes of visual impairment. However, very few studies have been done in which non-treatable causes of visual impairment have been studied. Hence there seemed to be need of study to analyze the causes of Permanent Visual Impairment. **Aims and Objectives:** To study clinical profile of Persons with Visual Impairment in the study population. To study the Prevalence & causes of Preventable Blindness amongst Persons with Visual Impairment in the study population. **Materials and Method:** The records of evaluation of persons visiting Divyang Board of the institute for certification of Visual Handicaps were studied and data was recorded in the MS-Excel sheet. Persons who presented to Divyang board but not entitled as visual handicap as per criteria of Government of India were excluded. This being observational study, basic data analysis was done using simple mathematical tools of MS-Excel. Identity of visual handicap persons is not disclosed during publication of the study. **Observation and Results:** We found in 67% cases congenital cause was responsible for visual impairment, and trauma was responsible for 19% cases and 14% cases were due to nontraumatic acquired causes. Traumatic etiology was more prevalent in male candidates than females. The 43% were one eyed patients, whereas remaining 57 % include bilateral cases. **Conclusion:** Congenital and hereditary causes are significant causes of permanent visual impairment. However apart from globally recognized causes like diabetic retinopathy, glaucoma, etc; ocular trauma is a significant risk factor as a one of the cause of avoidable permanent visual impairment. One eyed patients constitute a major population of persons with visual impairment, but lacking social benefits as per prevailing government norms, the further insight into this matter is a need.

INTRODUCTION

Visual impairment is a significant health problem affecting the common man worldwide. The World Health Organization (WHO) estimates, between 300 to 400 million people are visually impaired due to various causes. The major causes of blindness include cataract, uncorrected refractive errors, glaucoma, macular degeneration, corneal opacities due to trauma and infections, diabetic retinopathy,

trachoma and onchocerciasis. Blindness is strictly defined as the state of being totally sightless in both eyes. A completely blind individual is unable to see all. The term blindness, however, is commonly used to signify visual impairment, or low vision, meaning that even with eye glasses, contact lenses, medicine or surgery, a person does not see well. Visual impairment can range from mild to severe.^[1] Standards for certification of visual impairment are prescribed as per gazette notification by Department of Empowerment of Persons with Disabilities

(Divyangjan) of Ministry of Social Justice And Empowerment, Govt. of India in January 2018. As per these standards, visual impairment is subcategorized into two type viz, Blindness & Low Vision. "Blindness" means a condition where a person has any of the following conditions, after best correction— (i) total absence of sight; or (ii) visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with best possible correction; or (iii) limitation of the field of vision subtending an angle of less than 10 degree. "Low-vision" means a condition where a person has any of the following conditions, namely:— (i) visual acuity not exceeding 6/18 or less than 20/60 upto 3/60 or upto 10/200 (Snellen) in the better eye with best possible corrections; or (ii) limitation of the field of vision subtending an angle of less than 40 degree up to 10 degree.^[2]

Purpose of study

Among the common causes of visual impairment mentioned in the literatures, majority are easily treatable causes like uncorrected refractive error & cataract. Various literatures and articles are based on population based studies and hence the data largely involves treatable causes of visual impairment.^[3,4,5,6] However very few studies^[2] have been done in which non-treatable causes of visual impairment have been studied which can be certified. Hence there seemed to be need of study to analyze the causes of Permanent Visual Impairment.

So we conducted a study in order to get a true estimate of preventable causes of permanent blindness.

Aim of study

To study the Prevalence& causes of Preventable Blindness amongst Persons with Permanent Visual Impairment, registered in Divyang Board in Tribal district of Central India.

Objectives

1. To study clinical profile of Persons with Visual Impairment in the study population.
2. To study the Prevalence & causes of Preventable Blindness amongst Persons with Visual Impairment in the study population.

MATERIALS & METHOD

This is a Retrospective Observational Study conducted in a tertiary care centre of a tribal district of central India where Divyang board for certification is functioning. Study was conducted after obtaining due permission of Institutional Ethical Committee of the Institute.

During study the records of evaluation of persons visiting Divyang Board of the institute for certification of Visual Handicaps were studied and data was recorded in the MS-Excel sheet. Both Categories viz, Low Vision and Blindness were included as study population. Persons not entitled as visual handicap and hence rejected by Divyang board as per criteria of Government of India were excluded from study. This being Observational study, basic data analysis was done using simple mathematical tools of MS-Excel. Identity of visual handicap persons is not disclosed during publication of the study.

RESULTS

According to inclusion criteria followed, records of total 258 Visual Divyang persons were included in study from the record of 6 months duration. As per criteria the candidates with visual loss due to cataract or correctable visual loss due to refractive error were not included. However candidate with diseases like advanced proliferative diabetic retinopathy, advanced ARMD who are under treatment and visual acuity may improve or deteriorate to some extent in ongoing treatment were included and those were actually, the candidates with temporary visual handicap due to said criteria of handicap board. Also the candidates who had difficulty in recording vision on Snellen's chart due to less age were enrolled as temporary visual handicap though their disease is apparently permanent, so that those may be labeled specifically to their respective percentage group later in their life.

Candidates in our study were from age group of less than 1 year to more than sixty years in age, the distribution of those is shown in table no. 01 below. The gender wise distribution of cases according to various causes is depicted in table no. 02 below.

Table 1: Showing age distribution

Age group	Number of candidates (n=258)	Percentage
0-10 years	34	13.18 %
11-20 years	62	24.03 %
21-40 years	83	32.17 %
41-60 years	68	26.36 %
>60 years	11	4.26 %

Table 2: Showing gender distribution of various causes of visual impairment in study group

Causes of visual handicap	Male (n=171)		Female (n= 87)		Overall study population (n= 258)	
	Number	Percentage	Number	Percentage	Number	Percentage
Congenital	111	64.91 %	61	70.12 %	172	66.67%

Traumatic	36	21.05 %	13	14.94 %	49	18.99 %
Other Acquired causes	24	14.04 %	13	14.94%	37	14.34%

Table 3: Showing distribution of candidates according to their degree of visual impairment

Visual Impairment group	Category and percentage of visual impairment	Number of candidates in group (n=258)	Percentage of candidates among overall study population.
Low Vision	Category 0: 10%	15	5.81 %
	Category I: 20%	1	0.39 %
	Category II: 30%	111	43.02 %
	Category IIIa: 40%	48	18.61 %
	Category IIIb: 50%	2	0.78 %
	Category IIIc: 60%	19	7.36 %
	Category IIId: 70%	3	1.16 %
Blindness	Category IIIe: 80%	6	2.33 %
	Category IVa: 90%	12	4.65 %
	Category IVb: 100%	41	15.89 %

Being retrospective study the data regarding clinical events preceding the ultimate fate of loss of vision was limited. So classification of data in details as per clinical diagnosis was not possible in all cases. So we divided causes into three groups, viz., Congenital, Traumatic, and other non-traumatic acquired causes. In the congenital category of causes, apart from apparent causes like anophthalmose, microphthalmos, hereditary maculopathy etc. we included the causes like congenital cataract, high refractive error etc. in early childhood which lead to partial amblyopia despite of treatment were included in this group. Traumatic causes include the permanent visual loss due to traumatic causes like retinal detachment, perforation related endophthalmitis, traumatic optic neuropathy induced optic atrophy were included. Other non-traumatic causes include complications of diabetic retinopathy, uveitis, advanced or end stage glaucoma etc. We found in 66.67% cases congenital cause was responsible for visual impairment, and trauma was responsible for 18.99% cases and 14.34% cases were due to nontraumatic acquired causes. Traumatic etiology was more prevalent in male candidates than females.

Also, though being retrospective study with limited clinical data of candidates, we found that delayed presentation in congenital cataract/ squint cases, incomplete treatment in the form of non-adherence or non-compliance to amblyopia management, etc are significant factors in younger age group visual handicaps which may be due to lack of awareness. Also non-availability of subspecialty services like Vitreoretina facilities, Dedicated Pediatric Ophthalmology treatment in particular cases might have at least partially improved the outcome in many of the cases like congenital cataract, trauma etc. However quantitative data analysis is not possible from limited data available in our study. An additional observation in our study was that 43% were one eyed patients which constitute quite large proportion of patients with visual impairment.

DISCUSSION

A similar study^[8] has been published by Anita Ambastha, *et al.* regarding Causes of visual impairment in applications for blindness certificates in a tertiary center of Bihar and its role in health planning in 2019 in which they had data from April 2016 to March 2018. So they had utilized prevalent classification criteria for classification of visual handicap into 4 groups and studied 40 % and above visual handicap patients. They found Overall, most common cause of visual handicap and blindness was macular pathology, mostly hereditary macular degeneration. Amblyopia which was mostly anisometropic was the most common cause of VI. In age group 0–15 years, most common causes of blindness/visual handicap were congenital globe and hereditary retinal or optic nerve disorders. Complicated aphakia and pseudophakia were the most common and significant avoidable cause of blindness/visual handicap in this age group. In 16–30 year age group, macular pathology was the most common and significant cause of blindness/visual handicap, and amblyopia was the most common avoidable and significant cause of VI. Most Amblyopes have been given percentage impairment between 20–40% (category 0 to 1). However, on combining the two groups, (Between 0–30 years) most common cause of visual handicap came to be complicated cataract surgery, while amblyopia was the most common cause of VI, both being avoidable causes. Between 31–45 years of age group, corneal scar in one eye, mostly healed keratitis was the most common cause of VI in current study, while both eyes macular scar was the most common cause of blindness/visual handicap. Glaucoma and diabetic retinopathy (DR) were the most common causes of blindness/visual handicap between 46 and 65 years and above 65 years of age, respectively.

Madhurima Kaushik *et al.*^[9] in a study regarding Etiological spectrum of irreversible blindness in Kashmir in North India found Cases with unilateral blindness were 3.6 times more common than cases with bilateral blindness. Unilateral blindness occurred mainly due to glaucoma (16.41%), DR

(14.87%), age-related macular degeneration (13.33%), and trauma (pellet injury: 10.76%, non-pellet injury: 10.25%). The major causes of bilateral blindness were glaucoma (45.28%), DR (28.30%), and hereditary/congenital retinal diseases (16.98%).

In our study we found 43% were one eyed patients, whereas remaining 57 % include bilateral cases including those with prominent one eye affection like 7.36 % cases in category IIIc with 60% visual impairment. This is more so suggestive that though the social benefits are available to Divyang with 40% or above visual impairment, there is a vast population of one eyed persons (43% of our study population), who have compromised visual quality but not entitled to special benefits as per prevailing government norms.^[10]

A meta-analysis published in The Lancet. Global Health^[11] mentions that both cataract and undercorrected refractive error are among the three leading causes of blindness and Moderate and severe visual impairment in 2020. The other main causes were glaucoma, age-related macular degeneration, and diabetic retinopathy. So our study differs from meta-analytical data of global level, may be because multiple reasons viz, 1. because of sub-standard workplace protective measures causing trauma as a significant cause in our population, 2. Hereditary and congenital causes though being significant may not have taken significant count in their analysis, as the listed causes included treatable causes like cataract and refractive errors, etc.

Limitations of Our Study

1. This being hospital based study, the results of study cannot be typically generalized to overall general population.
2. This being retrospective exact etiological classification was not possible.

So a large scale population based cross sectional study with screening by Optometrists or trained healthcare workers and final diagnosis and categorization by Ophthalmologist is required to overcome these limitations.

CONCLUSION

Congenital and hereditary causes are significant causes of permanent visual impairment. Among acquired causes, apart from globally recognized causes like diabetic retinopathy, glaucoma, etc.; ocular trauma is a significant risk factor as a one of the cause of avoidable permanent visual

impairment. Better awareness in general population, availability of Vitreoretinal surgical facility & dedicated Pediatric Ophthalmology Services in Govt. set-ups may improve outcome in trauma cases. One eyed patients constitute a major population of persons with visual impairment, but lacking social benefits as per prevailing government norms, the further insight into this matter is a need.

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