

A RETROSPECTIVE ANALYTICAL STUDY OF PERMANENT VISUAL DISABILITY IN NORTH-WEST TAMILNADU

Sivaraman M¹, Kumaravel T², Srinivasan V³

¹Associate Professor, Department of Ophthalmology, Government Theni Medical College, Tamilnadu.

²Assistant Professor, Department of Ophthalmology, Government Dharmapuri Medical College, Tamilnadu.

³Senior Resident, Department of Ophthalmology, Government Dharmapuri Medical College, Tamilnadu.

ABSTRACT

BACKGROUND

Impairment in vision is a worldwide problem of socio-economic significance. This study was carried out with objective of analysing various causes of permanent visual disability in North West rural Tamilnadu, India.

MATERIALS AND METHODS

The study was done by evaluating 150 cases of permanent visual disability patients who came to ophthalmology OPD Department at Government Dharmapuri Medical College. Patients with permanent visual disability underwent ocular examination including visual acuity, anterior segment evaluation with oblique illumination and slit-lamp evaluation, retinoscopy and fundus examination with post mydriatic test to identify the cause of permanent disability.

RESULTS

In this study, permanent visual disability is equally distributed with mild increase in males (53%). The majority of the permanently disabled are found in age group between 15 and 45 years (57%), followed by age group 46 - 60 years (21%), 17% are more than 60 years (17%) of age and 5% are less than fifteen years of age. In the study, one-half of the disabled persons are 100% blind and one-quarter (23%) are one eyed. 11% are 75% visually disabled and 17% had 40% visual disability. In the study corneal blindness (27%) and retinitis pigmentosa (15%) are the top two causes of bilateral permanent and 80% of all unilateral blindness result from some type of injury to one eye.

CONCLUSION

In this study we conclude that the present visual disability due to diabetic retinopathy, glaucoma and pathological myopia could have been avoided or delayed if promptly diagnosed and treated at an earlier stage. Also the time between injury and treatment by ophthalmologist plays a main role in unilateral blindness due to injury.

KEYWORDS

Visual Disability, Glaucoma, Pathological Myopia, Diabetic Retinopathy, Corneal Blindness.

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BACKGROUND

India is now home to the world's largest number of blind people. Of the 37 million people across the globe who are blind, over 15 million are from India.¹ Blindness is less than defined by WHO as visual acuity of less than 3/60 in the better eye with all possible corrections.²

Main causes of blindness are as follows- Cataract (62.6%), Refractive Error (19.70%), Corneal Blindness (0.90%), Glaucoma (5.80%), Surgical Complications (1.20%), Posterior Capsular Opacification (0.90%), Posterior Segment Disorder (4.70%), Others (4.19%). The

estimated National Prevalence of Childhood Blindness/Low Vision is 0.80 per thousand.

The major aetiological factors responsible for blindness have changed with time and are different in different parts of the world. For instance, two centuries ago smallpox was a major cause of blindness, but with an extensive campaign for immunisation the disease was eradicated and blinding gonorrhoea infections in neonates are no longer common due to improved hygienic conditions.

In the early half of the twenty-first century, cataract was another major cause of blindness worldwide. The advent of microsurgery with operating microscopes, better quality of instruments, change to extracapsular cataract extraction from the intracapsular cataract extraction technique and the invention of the intraocular lens implant has remarkably improved the results of cataract surgery. With the ready availability of quality eye care services to the population at large, cataract blindness has been effectively conquered in the developed world.

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Corresponding Author:

Dr. Sivaraman M,

No. 3/134C, 12th Cross, Nehru Nagar,

Collectorate Post, Dharmapuri, Tamilnadu-636705.

E-mail: drmsraman25@gmail.com

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While cataract still remains the leading cause of treatable blindness. The other causes of blindness are glaucoma, diabetic retinopathy, vitamin A deficiency or age related macular degeneration.

Aetiology	Percentage
Cataract	43%
Glaucoma	15%
Trachoma	11%
Vitamin A Deficiency	1%
Others (Diabetic retinopathy, Macular degeneration)	24%

Table 1. Global Data of Blindness according to WHO (1998)²

Diabetic retinopathy is a leading cause of blindness in adults in their productive years and is unique in displaying a generally uniform epidemiological profile worldwide. The incidence of diabetes mellitus increases with the adoption of an urban lifestyle. Risk factors are broadly similar worldwide and the duration of diabetes is the most important predictor for the likelihood of developing diabetic retinopathy. Retinopathy is uncommon with a duration of less than 10 years of the disease, and is virtually present in some degree in 100% of diabetics after 20 years' duration. Sight-threatening retinopathy occurs at the rate of approximately 6% per year; of these, approximately two-thirds will have maculopathy and one-third will have proliferative diabetic retinopathy.

Treatment by laser photocoagulation is at best effective in preventing visual loss and has been shown to reduce the risk of blindness by 60% - 95%, depending on the type of involvement. Patients must therefore be identified by regular screening and referred judiciously before there is substantial overt visual deterioration. Primary prevention by changes in lifestyle of individuals at risk to help prevent or delay the onset of diabetes is ideal. Secondary prevention should be done by early diagnosis of type II diabetes with an initial baseline fundus examination under dilatation at the time of detection of diabetic status for clinically significant macular oedema and proliferative disease. Tertiary-level action in restoration of sight-'blind' diabetics is possible in selected patients with vitreous haemorrhage or tractional retinal detachment.

Vision lost due to glaucoma cannot be regained. According to studies, 50% of the glaucoma are not diagnosed.³

There will be 60.5 million people with OAG and ACG in 2010, increasing to 79.6 million by 2020 and Asians will represent 47%.⁴ Early detection and proper treatment is the key to preventing blindness from this disease. Certain risk factors and criteria for identifying people with primary open-angle glaucoma have been determined by epidemiological studies. These include age above 40 years, raised intraocular pressure, race (Afro-American populations have a 4 - 8 times higher rate of glaucoma than Caucasians), positive family history, myopia, diabetes, hypertension and possibly alcohol intake and smoking. In a screening program, the intraocular

pressure measured by a standard instrument (generally Goldmann applanation tonometer) is useful. A pressure reading of 21 mmHg as the 'cut-off between normal and abnormal is generally accepted and has a sensitivity of 65% and specificity of 91.7%.

The overall global prevalence of pathological myopia is estimated to be 0.9 - 3.1% with regional variability. The prevalence of pathologic myopia-related visual impairment has been reported as 0.1% - 0.5% in European studies and 0.2% to 1.4% in Asian studies.

The causes of severe visual impairment and blindness in infants and young children includes intrauterine (4%), perinatal (12%) and hereditary (31%).⁵

AIM

The aim of the study is to find out the various causes of permanent visual disability in Dharmapuri district, North West rural Tamilnadu, so as to find if any possible early intervention can prevent the permanent visual disability.

MATERIALS AND METHODS

The study was conducted in Government Dharmapuri Medical College for a period of six months between July 2016 and December 2016 among the outpatients visiting eye department for visual disability certificate. The following procedures were carried out.

Detailed history regarding onset progression, nature of trauma, surgery, etc. were recorded.

Pictorial and procedural consent were obtained. Anterior segment examination with oblique illumination and slit lamp examination, intraocular pressure measurement using Goldmann applanation tonometer in selected cases, retinoscopy and fundus examination by indirect ophthalmoscope with 20-D lens or slit lamp biomicroscopy using 78-D were done.

Inclusion Criteria

Patients with permanent visual disability of 30%, 40%, 75% and 100% are included in the study. All age groups are included. One eyed persons are included.

Exclusion Criteria

Persons with treatable blindness are excluded. Persons with 20% visual disability are excluded. The patients are categorised based on their severity and proposed disability percentages¹ (Govt. of India).

Category	Better Eye	Worse Eye	Percentage
Category 0	6/9 - 6/18	6/24 - 6/36	20
Category I	6/18 - 6/36	6/60 - Nil	40
Category II	6/60 - 4/60	3/60 - Nil or Field of vision 10 - 20	75
Category III	3/60 - 1/60	F.C at 1 ft - Nil or Field of Vision 10°	100
Category IV	F.C at 1 ft - Nil	F.C at 1 ft - Nil or Field of Vision 10°	100

One-eyed persons	6/6	F.C at 1 ft - Nil or 30% Field of vision 10	30
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Table 2. Visual Disability Criteria

RESULTS

	Number	Percentage
Males	86	58%
Females	64	42%

Table 3. Sex Distribution

In the study, permanent visual disability is equally distributed with mild increase in males (53%).

Age (yrs.)	Number	Percentage
< 5	7	5%
15 - 45	86	57%
46 - 60	31	21%
> 61	26	17%

Table 4. Age Distribution

The majority of the permanently disabled are found age group 15 - 60 years (78%). 57% are between 15 and 45 years and 21% are between 46 and 60 years. 17% of persons are above 60 years and 5% are in below 5 years.

Visual Disability Category Distribution

Category	Number	Percentage
II	24	17%
III	16	11%
IV	75	50%
One Eyed	35	23%

Table 5. Severity of Visual Disability

In the study one-half of the disabled persons are 100% blind and one-quarter (23%) are one eyed; 11% persons are 75% visually disabled and 17% persons have 40% visual disability. Bilateral blindness (115 cases out of 150).

Category	Number	Percentage
Corneal	32	27.8%
RP	18	15.6%
DR	12	10.4%
Optic Atrophy	6	5.2%
Glaucoma	12	10.4%
ARMD	9	7.8%
Myopia	7	6.1%
Albinism	4	3.5%
Congenital	15	13%
Total	115	100%

Table 6. Causes of Bilateral Blindness

In the study, corneal blindness (27%) and retinitis pigmentosa (15%) are the top two causes of bilateral permanent blindness followed by congenital causes (13%), diabetic retinopathy (10.4%) and glaucoma (10%). The other significant causes are found to be age related macular degeneration and pathological myopia.

One Eyed Blindness

Causes	Number	Percentage
Injury (Phthisis/Leucoma)	28	80%
Congenital	2	5.7%
Refractory amblyopia	2	5.7%
Retinal detachment	1	2.8%
Post surgical	2	5.7%
Total	35	100%

Table 7. Causes of Unilateral Blindness

80% of all unilateral blindness results from some of injury to eye. The other causes are congenital malformations, amblyopia, post-surgical and retinal detachment. One eyed blindness accounts for 23.3% of all blindness.

Images of Case Study



Figure 1. Corneal Ulcer



Figure 2. Hydrops (Keratoconus)



Figure 3. Sclerokernea



Figure 4. Microphthalmos/Coloboma

DISCUSSION

In the study, permanent visual disability is equally distributed with mild increase in males (53%). The majority of the permanently disabled are found between 15 and 60 years of age (78%). 57% are between 15 and 45 years and 21% are between 46 and 60 years. 17% patients are found above 60 years and 5% are below 5 years of age. This data is significant, because most of the permanently visual disabled persons are in the working age group which has a more impact on the socioeconomic status of the family. In the study, one-half of the disabled persons are 100% blind and one-quarter (23%) are one eyed. 11% patients are 75% visually disabled and 17% had 40% visual disability.

This correlates with the study by Praveen K Monga et al.⁶ 21 persons had been classified as having 30% disability, seven each had 40% and 75%, and 65 had 100% visual disability.

In the study, corneal blindness (27%) and retinitis pigmentosa (15%) are the top two causes of bilateral permanent blindness followed by congenital causes (13%), diabetic retinopathy (10.4%) and glaucoma (10%). The other significant causes are found to be age related macular degeneration and pathological myopia.

In other reports, corneal blindness account for 20 - 30% of all blindness in the developing countries.⁷ 80% of all unilateral blindness results from some type of injury to eye. The other causes are congenital malformations, amblyopia, post-surgical and retinal detachment.

One eyed blindness accounts for 23.3% of all blindness. Ocular trauma is the most common cause of unilateral blindness (90%) injury to cornea, particularly with vegetable matter leads to fungal keratitis⁸ and mostly native treatment and delayed in time to consult an ophthalmologist leads to loss of vision. Most of the corneal blindness are not suitable for keratoplasty due to associated ocular comorbidity.

According to WHO, trachoma contributes to 11% of blindness. In our study, trachoma does not contribute to

blindness instead the diseases which gains importance include diabetic retinopathy, glaucoma, age related macular degeneration and pathological myopia. Vision loss related to pathologic myopia is of great clinical significance as it can be progressive, irreversible and affects individuals during their most productive years.

CONCLUSION

Presently permanently blind persons due to diabetes (10.4%) and glaucoma (10%) could have been avoided. Enhanced screening of Diabetic patients attending Diabetic Outpatients Department and conducting screening camps for diagnosing diabetic retinopathy and glaucoma. Improved awareness about the Blindness due to Diabetes to the public through IEC activities and strengthening of the treatment Centres with adequate equipments and consumables will improve the lifestyle of the Diabetics and prevent Blindness. Patients with stable high myopia may be followed annually for visual acuity, refraction and general ophthalmic health. In the case of development of CNV or other complication, patients are followed more closely as directed by their treatment regimen. The protective measures in working area can prevent ocular morbidity.

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