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Clinico-epidemiological profile of patients presenting to tertiary eye care hospital in south India for blindness certificate – A prospective observational study

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ABSTRACT

Purpose: To evaluate and analyze the causes of visual impairment, handicap, and blindness in a tertiary eye hospital among patients applying blindness certificates in Chennai.
Materials and Methods: Applications for blindness certificates were analyzed over two years (2019-2021). The main cause of blindness, visual handicap, and visual impairment in these applications was ascertained by age group and etiology. Visual impairment disability percentages and definitions proposed by the Government of India [category 0-4, 20-100%] were used to categorize and give a percentage to all applicants. Results were compared with data from studies on blindness certificates and population-based studies.
Results: A total of 118 applications were reviewed. The mean age was 23.5±7.9 (range 12 to 65 years). The most common causes of blindness were retinitis pigmentosa and optic atrophy. In the age group 0-15 years, phthisis bulbi followed by microphthalmos were found to be the most common cause of blindness. Among the 15-30 years age group, macular pathology was the most common cause of visual blindness. Between 30-40 years of age group Retinitis pigmentosa is most common. Above 40-60 years of age, optic atrophy and glaucoma were the most common cause of blindness.
Conclusion: Data from applications for blindness certificates provide valuable information regarding different causes of visual blindness provide an insight into the overall trends in disease profile and service delivery.

1. Introduction

Globally, 253 million people are visually impaired, of which 36 million are blind and 90% of the burden of blindness affects persons in low and middle-income countries, including India.[1] More than 86% of the blindness is among persons aged 50 years and above and 80% of this blindness is avoidable.[1]

In the developed world, blindness registers are an important tool for public eye health programs and have been used as data sources for population-based research.[2] In India, this methodology has not been used, mostly because of the poor reporting and record keeping.

Although there is a decline in the overall prevalence of blindness in India, blindness and visual impairment (VI) continues to be a major public health problem and there are significant disparities in the prevalence and its causes across different regions in the country.[3] Despite availability of cost-effective interventions to eliminate blindness caused

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by cataract, cataract still remains the leading cause of blindness.

2. Materials and Methods

A prospective observational study by secondary data analysis of medical records of 118 people who applied for blindness certificate was performed at Regional Institute of Ophthalmology [RIO] Chennai. All applicants were examined and the final diagnosis was made after excluding avoidable causes of blindness before being sent for the disability certification board of the hospital. For purpose of certification, Government of India guidelines were followed which states that disability should be assessed when the specialist is convinced that further medical treatment/intervention is not likely to reduce the extent of impairment. In this study, blindness certificates would mean certificates with visual impairment of 40% and above, who are entitled to government benefits. We analyzed all applications for blindness certifications over a period of 2 years to know the causes of visual impairment and blindness in different age groups. In this study, analysis was performed according to visual impairment disability categories and percentages proposed by the Government of India. Category 1(40% disability: BCVA (Best Corrected Visual Acuity) 6/18-6/36 in the better eye) was considered as moderate visual impairment. Blindness was considered when BCVA was found to be less than 6/60 or field of vision less than 20 degrees in the better eye. One-eyed patients were given a 30% disability percentage (vision in better eye-6/6, worse eye-counting fingers, or no perception of light).

We also determined various causes of visual impairment, through which we could also investigate various conditions in the eye that have become a public health problem.

Percentage of visual impairment was given after excluding avoidable causes of decreased vision. Cataract and correctable refractive errors were excluded and advised treatment. The main causes of blindness, visual impairment were ascertained wherever possible for all applicants during the study period and tabulated by age group and etiology.

3. Results

In total 118 applicants were reviewed.

3.1. Age and demographic analysis

The mean age was 23.5±7.9(range 12 to 65 years). Males were 74% and females constituted 26% (Figure 1 a). The maximum number of applicants was between 15-45 years (Figure 1 b).

The age of onset of blindness showed,69 Of them were blind since birth [58.4%] and 36 of them were blind since childhood [30.5%]. 25 patients with posterior segment pathology have the various anterior segment findings, of which nystagmus is the most common finding[60%]. 82 patients had no perception of light in both eyes [69%].

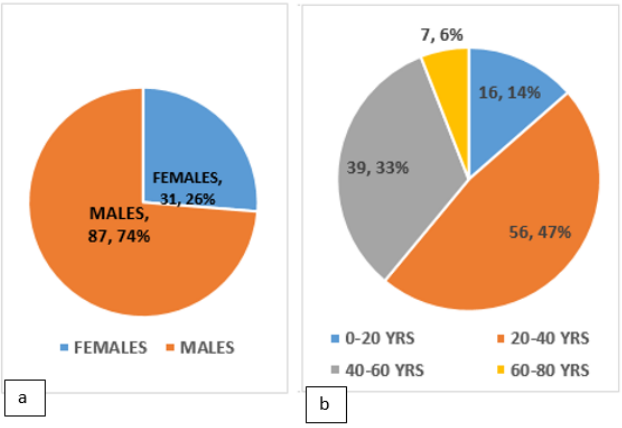

Fig. 1: a: Gender; **b:** Age distribution

Overall, the most common cause of blindness was retinitis pigmentosa and optic atrophy (Figure 2). In the age group of 0-15 years, phthisis bulbi followed by microphthalmos were the most common cause of blindness.] Age group 15-30 years macular pathology was the most common cause of visual blindness. Between 30-40 years of age group Retinitis pigmentosa is most common. Above 40-60 years of age, optic atrophy and glaucoma were the most common cause of blindness.

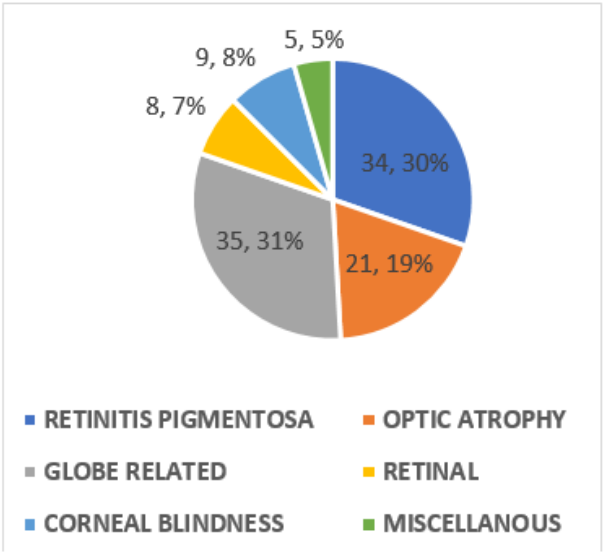

Fig. 2: Causes of blindness

17 patients were born from consanguineous marriage, of which the major contributions were optic atrophy and retinitis pigmentosa patients. Of total 118 patients, 25 patients had a positive family history of various types of blindness.(Figure 4)

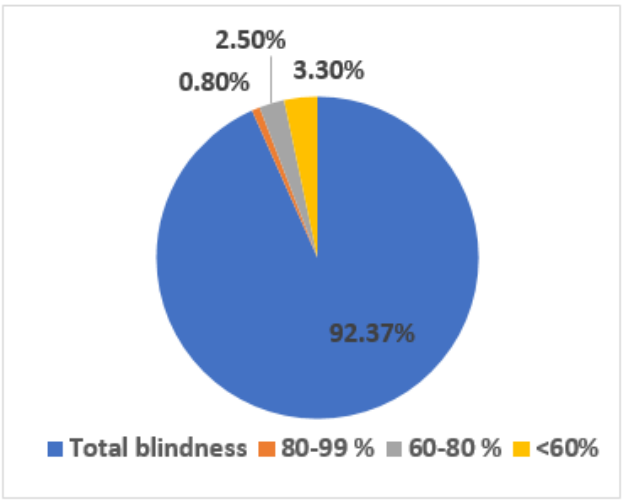

Fig. 3: Degree of blindness

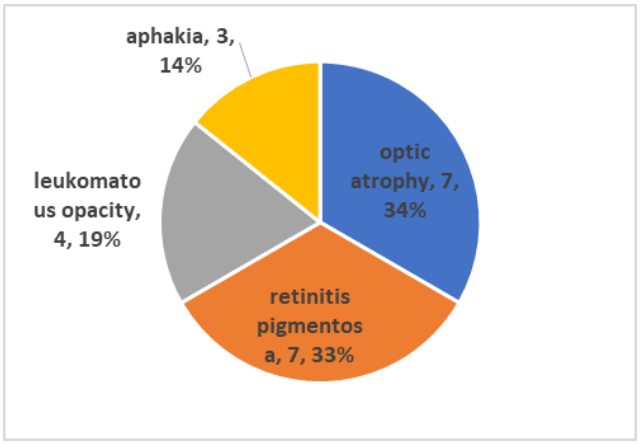

Fig. 4: Family history

3.2. *Disease based analysis*

The maximum contribution with regards to degree of blindness [92.37%] was from patients with total (100% blindness). In our study, pathologies of posterior segment i.e. retinal and optic nerve related contributed the most to cause of blindness. Among the patients with retinitis pigmentosa, there were varied presentation depicted in Figure 5, in which patients having both eyes retinitis pigmentosa forms the major contribution. Similary among optic nerve related blindness and globe related blindness, the optic atrophy and phthisis bulbi were the most common cause respectively as shown in Figures 6 and 7.

4. Discussion

Disability certificates such as those for blindness/visual handicap offer a lot of benefits to the recipients and help them to get a reservation in colleges and jobs.

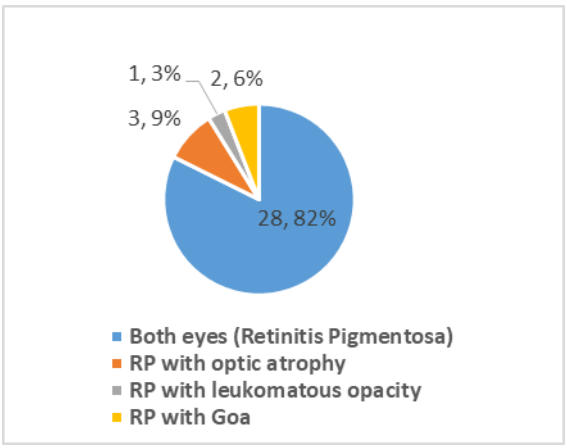

Fig. 5: RP

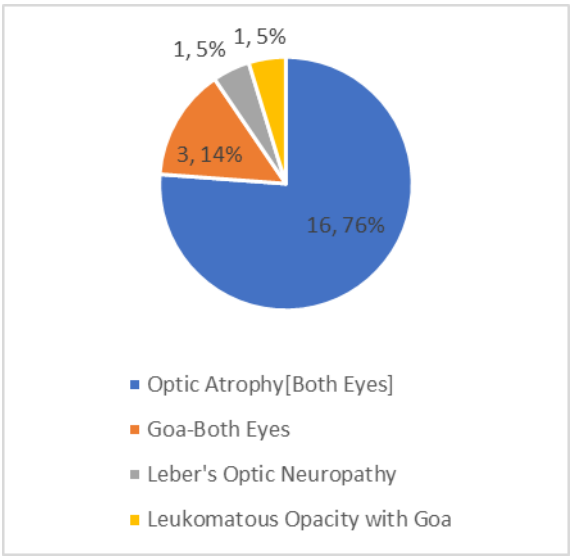

Fig. 6: Optic nerve related disorders

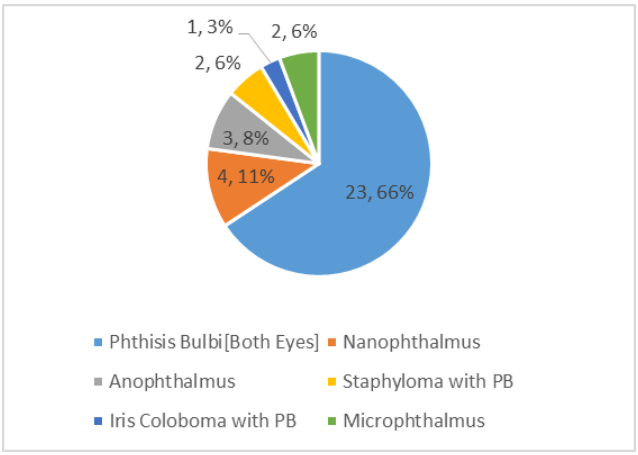

Fig. 7: Globe related blindness

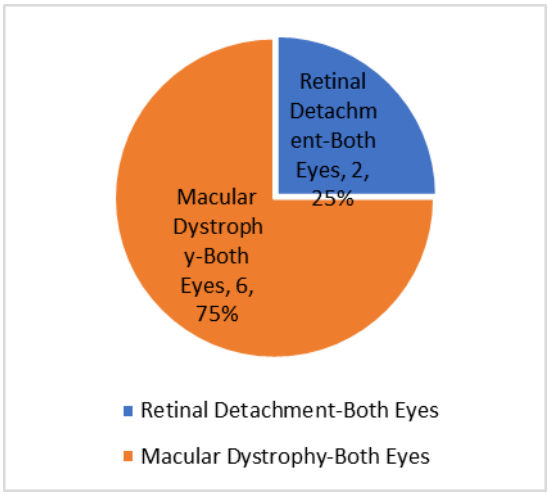

Fig. 8: Retinal causes

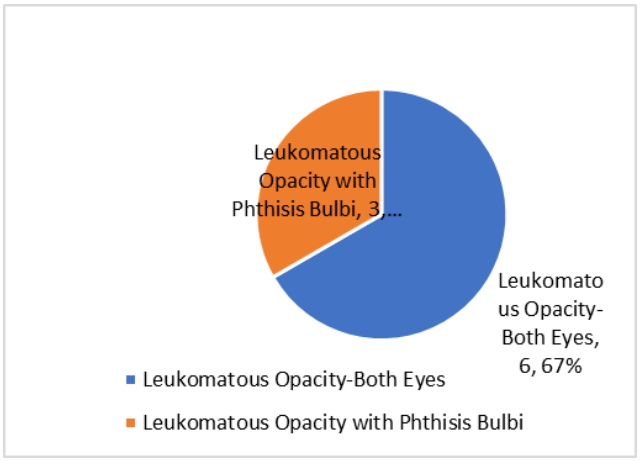

Fig. 9: Corneal blindness

They get travel concessions, income tax benefits, and disability allowances.[4,5] Hence there are many applicants for these certificates. Here we compare results of analysis of blindness/handicap certificates with different studies on blind certifications and population-based studies.

People with a disability percentage of 40% are considered as handicapped and entitled to government benefits.[4,5] There was a male predominance in applications for certification that could be because of their traditional role of bread earners and more mobility in our society, and hence more need for employment and other benefits.

The most common cause of blindness/visual handicap was Retinitis pigmentosa and optic nerve-related disorders in all age groups. However, visually disabled people of the young age group cause was phthisis bulbi followed by microphthalmos.[6] Most applicants were visually blind since birth(58%). A maximum number of applicants belonging to age 15-45 years applied for certification, probable because this is the job-seeking age group (20-40 years), and they can avail reservations in government jobs on this basis. Successful school eye screening program in Chennai is needed to tackle this problem.

Overall, the most common cause of blindness was retinitis pigmentosa and optic atrophy. But this observation is meaningless unless it is subdivided into appropriate age groups and analyzed. In the age group, 0-15 years of age phthisis bulbi followed by Microphthalmos be the most common cause of blindness. In age group 0–15 year, most common cause of blindness/visual handicap was congenital and hereditary disorders, which was in line with other studies.[6,7] Age group 15-30 years macular pathology was the most common cause of visual blindness. Literature search did not have too many articles that reveal causes of blindness from 15–45 years of age to compare with. Most data available is for childhood blindness and for those above 50 year of age. A study by Ambastha et al showed that in 15–30 years age group, macular scar (20%) was the most common, mostly hereditary macular dystrophy macular pathology to be the most common cause.[8] Analysis of studies on blindness certificates in India and outside did not reveal age specific causes of VI but only the most common causes across all age groups.[6,7,9–11] Between 30-40 years of age group Retinitis pigmentosa is most common. This is unlike the observations in study by Ambastha et al where the most common cause of visual impairment was corneal scar.[8] Though hereditary in nature, RP manifests with a gradual worsening of peripheral fields over a chronic period and hence patients fail to notice it as central vision is spared until late in the course of the disease. 25 patients had a positive family history, the majority among them were Retinitis pigmentosa and optic atrophy. Hence, screening of all family members at the time of diagnosis is a must and counseling of the family about disease nature and progression is mandatory.

Above 40-60 years of age, optic atrophy and glaucoma were the most common cause of blindness. This is in agreement with another study by Ambastha et al[8] where glaucoma (30%) was the most common cause among this age group.

Data from applications for blindness certificates should be used judiciously as it is not representative of the whole population. Bias exists in that many people who are eligible for certification are not applying for it. There is also an over-representation of applicants in the job-seeking age group here. These figures however surely give us some indication of the burden of vision impairment on the eye health services and provide a degree of insight into the relative burden of different eye diseases. It also helps to plan, implement and monitor eye health services. It can also be used to do trend analysis of different eye diseases and serve as an indicator of age-targeted service delivery. It is advocated that with the increased use of technology, region-

specific data from applications for blind certificates can be collated for better utilization of data for epidemiological purposes. This study indicates the need for implementation of screening programs to identify blindness early at school and the periphery level and to create public awareness. Resource allocation may be more towards procuring low vision aids and psychological counseling to patients and family members during regular visits.

5. Conclusion

Applications for blindness certificates generates data which provides fruitful insights regarding different causes of visual impairment that might otherwise not be certifiable but have an impact on the quality of life of the sight impaired. It can also provide valuable information about existing trends in disease profile and delivery of essential services so that health care strategies can be tailor-made and dovetailed to provide maximum benefits to the most deserved in the society.

6. Source of Funding

None.

7. Conflicts of Interest

There are no conflicts of interest.

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