Original Article

# The Prevalence of the Leading Causes of Certification for Blindness and Partial Sight in the Hassan District of Karnataka, India

Opthalmology Section

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## ABSTRACT

**Context:** The prevention of visual impairment is an international priority which was agreed upon at the World Health Assembly of 2002. Yet, countries like India lack contemporary data on the prevalence and the causes from which the priorities for its prevention, treatment and management can be identified.

**Aims:** To identify the leading causes of visual disability among certified, visually disabled individuals in the Hassan District in Karnataka, India.

**Settings and Design:** A prospective cross-sectional study.

**Methods and Material:** The cases were selected on the basis of a simple random sampling method.

**Statistical analysis:** Descriptive analysis was done and the results were expressed in terms of mean, median and proportions.

**Results:** In our study, the leading causes of certification for blindness and partial sight were congenital anomalies, refractive errors and retinitis pigmentosa.

**Conclusion:** There will be a variation in the prevalence of leading causes of certification for blindness and partial sight, from one geographical area to another. If the accurate cause is identified, the necessary preventive measures can be taken.


**Key Words:** Eye, Vision, Certification

## INTRODUCTION

The certification for blindness or partial sight is the process by which social services for the visually disabled are coordinated. The registration as blind or partially sighted in India is voluntary and it is performed by certification by a duly constituted board that includes an ophthalmologist, a physician and the chairman of the Medical Board. Defining disability is difficult to accommodate the expectations of all the disabled groups. According to a guideline of the Ministry of Social Justice and Empowerment of the Government of India, the minimum degree of disability should be 40% for an individual to be eligible for any concessions or benefit [1]. The 58th round data from the National Sample Survey Organization (NSSO) revealed that, of all the disabled individuals in India, 10.88% were blind and that 4.39% had low vision [2]. As per the Census of India, 2001, the prevalence of the totally blind persons was found to be 156 per lakh population and the prevalence of low vision was found to be 61 per lakh population. The prevention of visual impairment is an international priority, and its planning requires contemporary data regarding its incidence and causes, based on which its priorities can be identified. However, under-registration of the blind is a global problem [3,4]. Very meagre data is available on this from the state of Karnataka. The present study was designed to conduct an analysis of disabled individuals who belonged to the Hassan District in Karnataka, India, who were certified as visually disabled by the duly constituted medical boards. The district predominantly has a rural population, including people who live in remote forest areas.

## METHODOLOGY

Patients with visual disability of 40% or above were included in this study. A written consent and ethical committee clearance were obtained from all the individuals who were included in the study group. The purposive sampling method was used. The percentage of disability was calculated, based on the guidelines for the evaluation of various disabilities and the procedure for certification [Table/Fig-1] [1]. There is a designated centre at Sri Chamarajendra Hospital which is attached to the Hassan Institute of Medical Sciences, Hassan (Karnataka) for the certification of the visual impairment. The patient data were collected from individuals who attended the disability clinic at our centre. All the certificates which were completed during the period from February 2009 to August 2009 were analyzed. During this period, 272 people were certified. The main cause of the visual loss was ascertained.

The patients who attended the disability clinic were examined in the out patients department. The diagnosis was based on the medical history and the clinical examination and special investigations such as tonometry, fundus photography, ultrasound examination and automated perimetry were done as and when they were necessary.

## STATISTICAL ANALYSIS

| Best corrected visual acuity in the better eye | Best corrected visual acuity in the worse eye | Percentage of impairment |
|---|---|---|
| 6/18-6/36 | 6/60 to nil | 40 |
| 6/60-4/60 or field of vision 10°.20° | 3/60 to nil | 75 |
| 3/60 to 1/60 or field of vision 10° | Finger counting at 1 ft. to nil | 100 |
| Finger counting at 1 ft. to nil or field of vision 10° | Finger counting at 1 ft. to nil or field of vision 10° | 100 |

**[Table/Fig-1]:** Categories of visual disability

Descriptive analysis was done by using the SPSS +17.0 computer package for statistics. The variables of interest in our study were age, gender, percentage of disability and the causative factor of the disabled individual. The results were expressed in terms of mean, median and proportion.

## RESULTS

The study was conducted on 272 individuals. Of these individuals, 52.95% (144) were males and 47.05% (128) were females, the M:F ratio being 1.12:1. Of the total population which was studied, 55.15% were 100% visually disabled and only 20.95% had 40% visual disability [Table/Fig-2].

A majority, 107 (38.60%) individuals were in the age group of 40 to 65 years and only 27 (9.92%) were above 65 years of age [Table/Fig-3]. The mean age was 52.18 years and median age was 34 years.

A majority, 151 (55.53%) were unemployed, 72 (26.47%) were involved in agricultural work, 30 (11.02%) were studying in a blind school and 19 (6.98%) were self employed.

Among the visually disabled, congenital anomalies accounted for microcornea, microophthalmos, anophthalmos and coloboma of the eye (22.05%), refractive errors (19.85%), retinitis pigmentosa (18.01%), others [(corneal dystrophy, corneal degeneration, anterior staphyloma, retinal dystrophy, central choroiditis, retinal detachment) (11.02%)], optic atrophy (6.98%), corneal opacity (5.51%), lens [(congenital cataract and complicated cataract) (5.14%)], [age related macular degeneration (ARMD) (5.14%)], glaucoma (4.04%), uveitis (1.10%) and diabetic retinopathy (1.10%) [Table/Fig-4]. The power of the study was 80% (1-β error).

| Amount of visual disability | Number of visually disabled |
|---|---|
| 40% | 57 (20.95%) |
| 75% | 65 (23.89%) |
| 100% | 150 (55.15%) |

**[Table/Fig-2]:** Number of visually disabled in each category

| Age (years) | Number of visually disabled |
|---|---|
| <14 | 38 (13.98%) |
| 14-40 | 102 (37.50%) |
| 40-65 | 107(38.60%) |
| >65 | 27 (9.92%) |

**[Table/Fig-3]:** Number of visually disabled in each age group

| Causative factor | Visually disabled |
|---|---|
| Congenital anomalies | 22.11% (60) |
| Refractive errors | 19.85% (54) |
| Retinitis pigmentosa | 18.01% (49) |
| Others | 11.02% (30) |
| Optic atrophy | 6.98% (19) |
| Cornea | 5.51% (15) |
| Lens | 5.14% (14) |
| ARMD | 5.14% (14) |
| Glaucoma | 4.04% (11) |
| Uveitis | 1.10% (3) |
| Diabetic retinopathy | 1.10% (3) |

**[Table/Fig-4]:** Showing various causes of blindness and partial sight

## DISCUSSION

Many ocular diseases can cause visual system damage and functional loss, which can lead to blindness and low vision. This will not only affect the patients' daily life and working abilities, but will also have an adverse consequence on the society and the economy development. The World Health Organization (WHO) estimated that there were approximately 161 million visually impaired people all over the world, among whom 37 million were blind. Over 90% of the blind people lived in the developing countries [5].

Blindness and vision impairment remain major public health problems in India, that need to be addressed [6]. The presence of a large number of blind people in India has tremendous economic implications. It has been estimated that the economic burden of blindness in India is approximately equivalent to 73% of the annual expenditure which has been set aside by the government for the entire health care sector in a year [7]. It is approximately US $4.4 billion per year [8-11]. Attempts to address the burden of blindness in India and its economic implications have focused on reducing the burden of curable blindness in India, primarily through a cataract-centered policy which is aimed at increasing the number of cataract surgeries [12, 13]. Recent studies have however reported on the inadequate quality of cataract surgery from various parts of India, with up to 50% of the cataract operated persons remaining blind even after surgery. This has led to an additional focus on improving quality of care [14-16].

It was evident from our study that the number of males who attended the medical board to obtain the disability certification was higher than that of the females. This was because of the existing certification system which was institution-based and hence a problem of access for the females could occur due to the social and economic obstacles.

In our study, the patients in the age group of 40-65 years and of 14-40 years were significantly large in numbers as compared to the elderly age group. This suggests that the driving force behind attending the board for the disability certification was more among the working age group. This was probably due to the presence of certain benefits which were associated with the disability certification such as employment, education and conveyance, which were more likely to serve the purpose of young individuals than the elderly. Similar observations were made in Bunce et al (1998) study, where non-certification was found to be more common in patients of 65 years or more than those under 65 years, with a trend of increasing odds with increasing age [3]. In our study, the patients with 100% disability formed a majority group as compared to the patients with a disability of the lower grades. A similar finding was noted by Bunce et al. (1998) in their study, where a partially sighted ophthalmic outpatient was estimated to be three times more likely to be non-certified than a blind patient with a similar diagnosis [3].

Congenital and developmental anomalies accounted for 22.05% of all the disabilities and this was the leading cause in our study. This finding could be correlated with the findings of Sambuddha Ghosh et al's (2008) study , in which they accounted for 38.71% of all the disabilities [17]. This can be explained by factors such as consanguinity and the congenital rubella syndrome which are associated with such developmental disorders in India [18,19].

The congenital abnormalities worldwide (microphthalmos, anophthalmos and coloboma) accounted for severe visual impairment and blindness in 18% and 25.8% of the blind school children in south and north India, respectively [20,21].

As compared to the findings of the study of Bunce C and Wormald R (2006), the leading causes of certification for blindness and partial sight in England and Wales were ARMD (57.2 %), glaucoma (10.9 %), diabetic retinopathy (5.9 %), optic atrophy (3.1 %) and hereditary retinal disorders (2.8 %).

In Avisar R, et al (2006) study, the prevalence, incidence rates and the causes of blindness in Israel were ARMD (28%), diabetic retinopathy (14.4%), glaucoma (11.8%), myopic maculopathy (7.4%), optic atrophy (6.5%), cataract (6.5%), and other diagnosis (25.4%).

Similar results as inour study were observed in another Indian study by Ghosh S et al (2008), in which congenital and developmental anomalies were present in as high as 38.71% of the eyes [17].

This analysis strongly suggests that the three main causes of sight loss in England – Wales and Israel are ARMD, diabetic retinopathy and glaucoma. In our study, congenital anomalies, refractive errors and retinitis pigmentosa were the main causes of sight loss. Treatment for the first three leading causes of visual impairment existed in two other western studies, whereas in our study, only preventive measures could be taken, without any definitive treatment with good visual prognosis. Hence, we have to concentrate on genetic counseling and discourage consanguineous marriages to prevent congenital anomalies and retinitis pigmentosa. School eye screening is necessary to identify and treat refractive errors.

## CONCLUSION

There will be a variation in the prevalence of leading causes of certification for blindness and partial sight, from one geographical area to an another. If the accurate cause is identified, then the necessary preventive measures can be taken.

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