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Demographic Profile of Patients with Corneal Blindness at Tertiary Health Care Centre

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Author's contribution

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Objective: To study the etiopathogenesis, age, gender distribution and visual impairment due to corneal blindness in a tertiary health care centre. In addition, to create awareness for eye donation among the population.

Methods: The study was a cross sectional study conducted at a university hospital. Patients who arrived at the outpatient department while the study was ongoing had their demographic profiles recorded. Corneal blindness was defined by presenting a VA 3/60 by corneal disease in the affected eye. The experts made the diagnosis. 56 patients of both gender and age were included in study.

Results: The prevalence of corneal blindness was found to more in men than women were and is more in patients with age >50 and < 10 years. The prevalence is more in rural population than urban among which farmer are most involved

Conclusion: To decrease the burden of the corneal blindness patient in developing countries like India, there is need of educating the population about preventive measures and development and modernisation of ophthalmic centres.

Keywords: *Infectious keratitis; corneal blindness; trachoma.*

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1. INTRODUCTION

Out of 1 billion people with visual impairment which could have been prevented globally with timely intervention includes 123.7 million unattended refractive error patients, 826 million unaddressed presbyopia patients, 65 million cataract patients, 6.9 million glaucoma patients, 4.2 million corneal opacity patients, 3 million diabetic patients having affected vision due to retinopathy, and 2 million trachoma patients [1].

Due to some tragic and unacceptable social and economic terms there are around 200 million population in the world which is visually disabled. And to unavailability of primary and very limited speciality treatment the count rises by nearly 2 million every year due to mismatch between health care delivery and the rate at which population is increasing [2].

Most of the corneal blindness patient are present in developing countries and the major contributing factor for 90% of the whole cases of corneal ulcer and ocular trauma are from developing nation [3] Since India is a developing country, it presents significant challenges in treating corneal blindness since most of the population lives in rural areas. Based on various meta-analyses conducted in India, corneal blindness was the most common cause of blindness among adults, with a prevalence of 0.45% (95% CI 0.27% to 0.64%) [4].

Cornea is a transparent, avascular, and clear structure that Covers a sixth of the circumference of the anterior part of the globe [5,6]. The cornea's optical zone is approximately 4 mm long and Located in the central third of the cornea. The cornea, along with the pre-corneal tear film, is a crucial structure that forms the main refractive surface of the eye. 45 Diopter is the optical power of the Cornea, that is about 3/4th of the optical power of human eye [5].

the transparency of the cornea is altered in corneal blindness, resulting in corneal scarring and, ultimately, blindness. corneal blindness causes include inflammatory eye diseases, a wide variety of infections, such as keratitis, xerophthalmia, eye trauma, trachoma, congenital diseases and common home remedies and traditional medicine which may hurt the eyes instead of helping them [7]. Depending on the age, there are various causes of corneal blindness. Adults who live in countries with less-developed economies are more likely to suffer

corneal blindness because of the following (based on the indications for keratoplasty): corneal scars (28.1%) and active keratitis (12.2%). In the developing world, children aged 5-14 are most likely to undergo keratoplasty when they acquire non-traumatic scars (71.32%) [8,9].

2. AIMS AND OBJECTIVES

To study the demographic profile in patients with corneal blindness at tertiary health care Centre

3. METHODS

This study was Six-month short study conducted at the Department of Ophthalmology, Acharya Vinoba Bhave Hospital, Sawangi. This was a hospital oriented Cross Sectional study done from. All patients with corneal blindness coming to OPD at Acharya Vinobha Bhave Rural Hospital was selected for the study after taking the inclusion and exclusion criteria into consideration.

3.1 Inclusion Criteria

- 1) All patients of all age group and both sexes coming to ophthalmology OPD.
- 2) All patients with corneal diseases were included.

3.2 Exclusion Criteria

- 1) Patients unwilling to take part in the study.
- 2) Patients lost during the study.
- 3) Blindness due to other causes like cataract and retinal disorders.

Sample size: Using desired error of margin 3% and Prevalence of corneal blindness in rural population of central India [10] = 0.12% i.e., 0.012 sample size comes out to be 50.60 rounding off to 55 patients needed in the study. Random sampling technique was used.

Every participant in the study underwent a complete eye examination, which included measuring IOP, slit-lamp examinations, and best corrected visual acuity.

3. RESULTS

Total patients examined are 56. (Table 1).

showing area of distribution of corneal blindness patients of which maximum patients are from rural area and 19 patients are from urban area.

In gender distribution we found that 34 (60.71%) were males and 22 were females (39.28%). (Table 3).

The etiology for corneal blindness among 56 patients is shown in (Table 2).

The commonest is corneal opacity 21(37.5%) followed by infective keratitis followed by corneal dystrophies in 9 patients (16.07%) among all patients, these are followed by infective keratitis in 13 patients (23.21%). Corneal degenerations in 6 patients out of 56. Blindness due to corneal injuries are found among 5 patients (8.92%). Lastly the congenital cause responsible for blindness in 2 patients (3.71%).

Table 1. Area of distribution

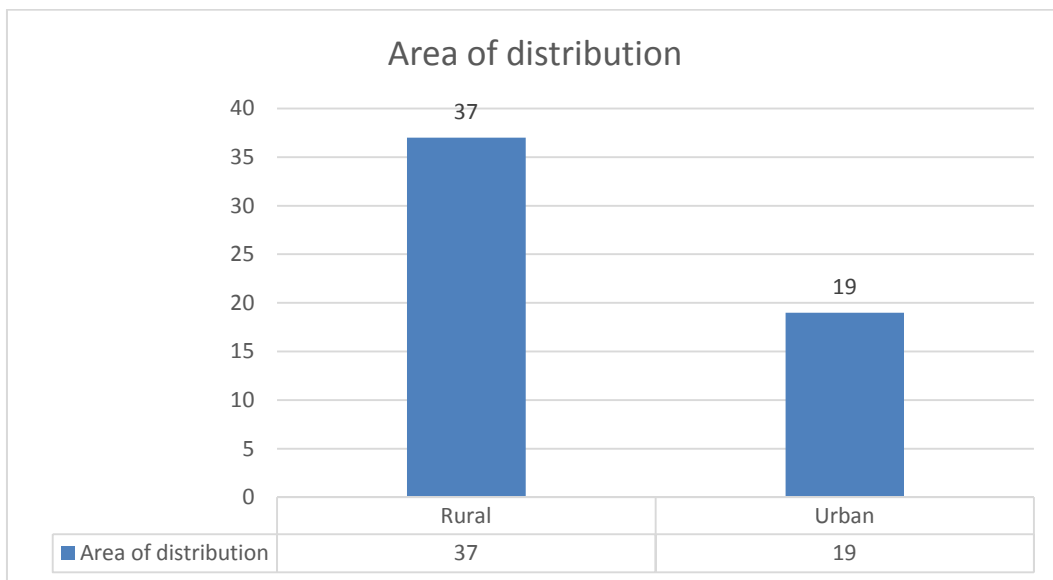


Table 2. Etiopathogenesis of corneal Blindness

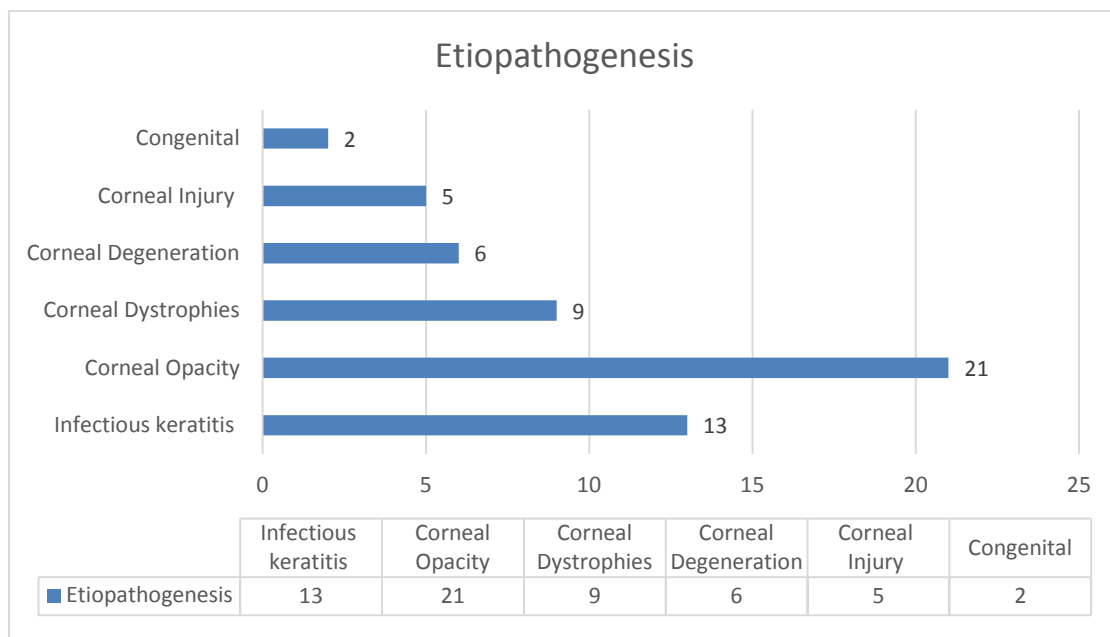


Table 3. Gender distribution

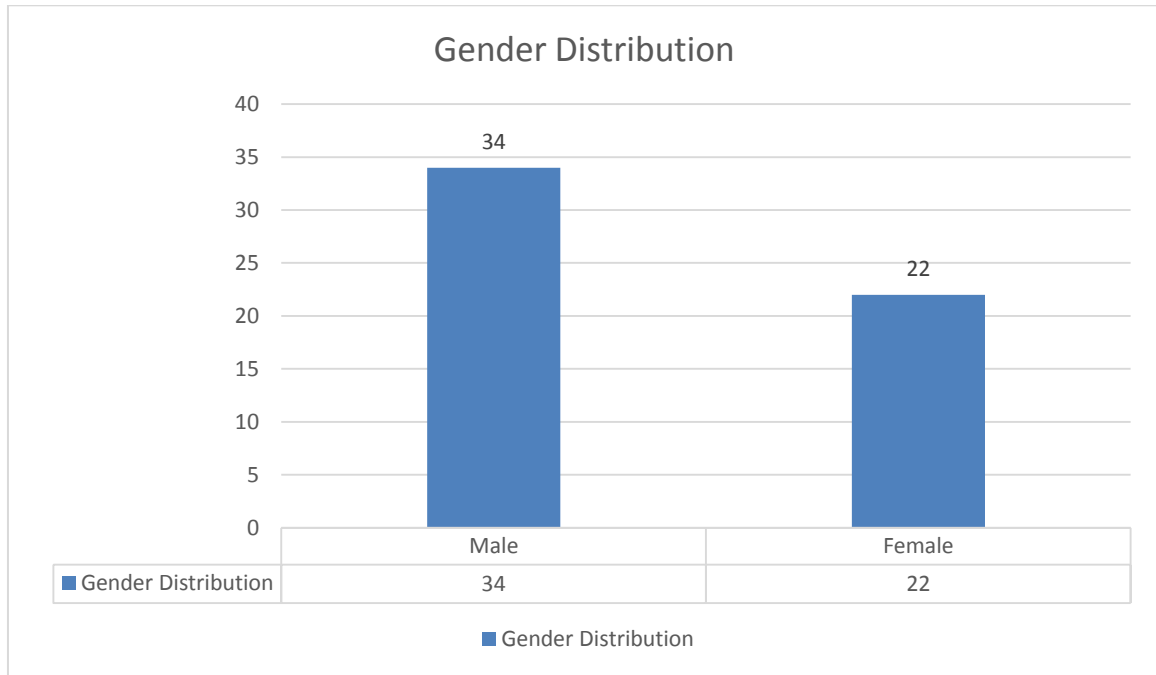


Table 4. Age distribution

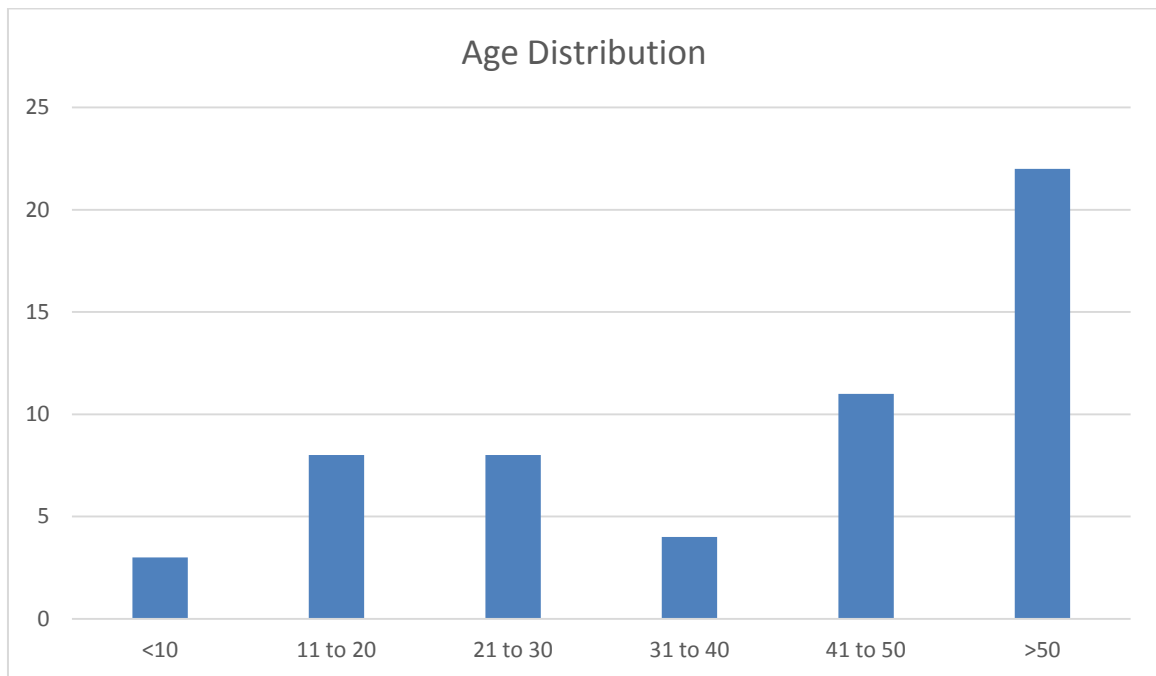


Table 5. Visual impairment

Visual impairment	Patients	Percentage
<6/60	32	57%
6/36-6/18	18	33%
>6/18	5	10%

When comes to gender distribution in our study the corneal blindness is divided in 6 categories for better understanding of distribution in age groups.

Maximum number of patients affected falls in more than 50 age group i.e., 22 (39.28%) out of 56 patients. Followed by 41-50 age which includes 11 patients (19.64%). Less than 10 year includes 3 (5.35%). 11-20 age group include 8 (14.28%), 21-30 age group includes 8 (14.28%) patients.

4. DISCUSSION

Very few studies published about the prevalence of corneal opacity which shows 4.2% people are affected in age ≥ 20 years and 3% in age ≥ 50 years [11,12,13].

In a study done in Haryana, which is hospital based 11.6% patients having visual acuity of 6/9 or more were found to have corneal disease. This study excludes age gatherings, they neglected to give extensive and delegate information on the severity of corneal blindness. The prevalence in this study was 0.12% and Patient with impaired visual corneal infection was 0.45% [14].

In another study done in India, the pervasiveness of corneal visual deficiency was found to 0.10% (visual acuity $< 6/60$ in better eye) and unilateral visual deficiency was 0.56% [15].

A Chinese report likewise revealed a comparative commonness of corneal visual impairment of 0.1%. [16].

In rural communities, corneal blindness is most caused by corneal opacity (37.60%), followed by infectious keratitis (23.21%) and corneal dystrophies (16.07%).

In the 19th century, trachoma was the leading cause of corneal blindness and responsible etiology factors have been found to be different today. The prevalence of corneal blindness has decreased since the establishment of community health programmes and vaccination campaigns to prevent infectious diseases [17].

In south Indian populations, infectious keratitis (59.5%), along with trauma (23.2%), cause most of the corneal blindness. Similar results have also been reported in Thailand and Gambia.

A study done by Dube et al. [18] shows that corneal blindness is most prevalent in farmers i.e. those from rural areas and without formal education. In our study we examined 56 patients with corneal blindness and found that 66.07% of them are from rural areas.

It was discovered that corneal opacity was the major cause of blindness in adults, especially those over the age of 40. This may be because of corneal scarring following keratitis during adulthood, followed by corneal dystrophies and keratitis.

Dondhana et al. [19] Found that keratitis during childhood is leading cause of blindness and majority of that are because of vitamin A deficiency.

According to Sharman S et al. [20] corneal ulcers and trauma account for the majority of new cases of corneal blindness each year, with 1.5- 2 million cases annually.

In study by Sony P et al. [21] Infective keratitis was cause for corneal blindness in 28.38 % which is comparable to our study that we found 23.21% patient with infective keratitis.

Contrary to previous studies, the main cause of corneal blindness in this study was corneal opacities due to ocular trauma and corneal decompensation after cataract surgery rather than infectious keratitis, this may have happened due to improved quality of eye care at tertiary health care centres. But this is not enough, there is need of good quality of eye care services available at all levels of health care centres, this will help to reduces mainly the infectious cause of corneal blindness. The vaccination program which includes Vitamin A has markedly reduced the cases of corneal blindness due to keratomalacia and blindness due to vitamin A deficiency. Data from rural areas cannot be directly applied to urban populations, and a survey in urban areas is necessary to obtain an overall picture. Among the age groups affected by this study, the majority were an older age group > 51 years [22].

Ament et al. [23] and Nikose et al. [17] have paediatric age group consist of 18.75% and 22.2% which is relatable to our study i.e 19.63%.

The male population was predominantly found to affected 60.71%. In our study there is male predominance in corneal blindness which is

relatable to study done by Dube et al. [24] Wang et al. [25] stated, As more population resides in rural area and engaged with farming activities predispose to corneal injury which are from older age group. The sample size was insufficient to determine the true prevalence of corneal blindness [26].

In order to reduce corneal blindness, health promotion programmes should target those who are identified as being at a higher risk, based on epidemiological data. To ensure that these programmes have an impact, the government, non-governmental organizations, eye health professionals, including ophthalmologists, and the community must be involved, and these programmes need to be integrated with the other relevant health and safety programmes.

Programmes promoting health should educate the public about the risk and consequences of corneal blindness, as well as possible safety and prevention measures.

To reduce the risk of corneal blindness, and to benefit from early detection and treatment if needed.

These programmes should focus on keratitis during childhood, trauma and keratitis during adulthood, which are the major causes of corneal blindness based on our data. These programmes may target children and young adults, especially males, with an emphasis on trauma related to work.

As one of the objectives of the Department of Health and Family Welfare of the Government of India, which has control of blindness as one of its objectives, integrate the school health programs with those relating to health promotion and child survival. Promoting universal vaccination and improving the health status of vitamin A in population. Furthermore, it would enable the programme to reach the primary healthcare level in the community with the increased involvement of parents and teachers.

The workplace must be made safer to reduce the incidence of corneal blindness resulting from trauma. Eye protection requirements can reduce corneal blindness risk among workers performing high-risk jobs. The workplace must be made safer by introducing legislation. However, data suggest the use of eye protection in the workplace is not universal, and eye injuries may decrease if more eye protection in the workplace

is worn [27]. In addition to enforcing safety regulations, health promotion programs may be needed to encourage the use of protective eyewear at work. Our country has a large informal workforce, so this kind of program would need to engage members of the local community [28].

To prevent corneal blindness due to poor-quality cataract surgery, the quality of cataract surgery must also be reasonable. The awareness of the need for good quality cataract surgery should be improved in the eye care personnel, particularly ophthalmologists. Moreover, to prevent corneal blindness caused by keratitis, eye care personnel should be knowledgeable about the appropriate treatment of corneal ulcers, and where they should refer patients who have such ulcers.

In conclusion, Indian population is plagued by a considerable amount of corneal blindness, including infections and trauma, the majority of which can be prevented.

5. CONCLUSION

Corneal opacities were the commonest etiopathogenesis and one of the leading causes of visual disability found in our study. Other major etiologies of corneal blindness were corneal dystrophies, degenerations, infective keratitis, and corneal injuries in adults.

6. RECOMMENDATION

The target group was from rural area with lower socio-economic status and poor hygiene which is a significant health problem and needs to be given more attention. As a result of this study, blindness programme initiatives can be planned and resources needed to provide comprehensive corneal services for the community can be estimated, thereby eliminating avoidable corneal blindness and the associated visual impairment.

Prophylaxis and early treatment remain the gold standard in reducing the burden of corneal blindness in developing countries like India.

CONSENT AND ETHICAL APPROVAL

An institutional ethics committee of DMIMSU approved the study. Informed consent was obtained from all subjects after the nature of the study explained to them.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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