Prevalence and Determinants of Corneal Blindness in a Semi-Urban Population of Southwest Nigeria

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Abstract

Purpose: To determine the prevalence and determinants of corneal blindness in a semi-urban population of Southwest Nigeria. **Materials and Methods:** This population-based, cross-sectional study was conducted over a period of two months from 3rd March to 30th April 2014. A multi-stage sampling method with probability proportional to size procedure was used to select 1002 participants. The study involved obtaining information from the participants on demographic data and ocular history suggestive of the causes of corneal blindness using interviewer-administered questionnaires. Ocular examinations of the anterior and posterior segments of the participants were performed using pen touch, magnifying loupe, slit lamp and direct ophthalmoscope. The data collected were analyzed using the Statistical Package for Social Sciences software version 22. Summary statistics was presented using frequency tables, charts, means and rates. The level of statistical significance was set at 5%. **Results:** There were 1002 participants (410 males and 592 females). Their age range was 5–92 years with a mean age of 43 (±17) years. Eleven participants (13 eyes) had corneal blindness with a prevalence of 1.1% (95% confidence interval: 0.5–1.7). Corneal blindness accounted for 9.6 and 20.4% of bilateral and unilateral blindness, respectively. The prevalence of corneal blindness in the communities was greater among the male respondents, the older age groups, the farmers and the participants with lower educational status. The major causes of corneal blindness in the study were post-microbial keratitis (36.4%) and trauma (27.2%). **Conclusion:** Corneal blindness is still a major cause of both unilateral and bilateral blindness. Preventive measures for corneal blindness need to be further strengthened. In addition, affordable and accessible corneal surgery facilities should be established.

Keywords: Corneal blindness, developing countries, prevalence, semi-urban population

Introduction

The cornea is a clear, transparent and avascular structure that covers the anterior one-sixth of the total circumference of the globe.[1,2] The optical zone of the cornea is about 4 mm and located in the central one-third of the cornea. The cornea is a vital structure that forms the major refractive surface of the eye together with the pre-corneal tear film. Its refractive optical power is approximately 45.0 dioptres, which is about three-fourth of the total optical power of the human eye.[2] It also protects the delicate intraocular contents with its tough collagen structure against the external harmful agents.[2] The cornea has the following five histological layers: epithelium, bowman layer, stroma, descemet's membrane and endothelium.[1,2] Corneal transparency depends on the tightly arranged epithelial cell layers and the stroma with regularly arranged keratocytes and collagen fibrils. The corneal endothelium plays an important role in maintaining the relative deturgescence of the corneal stroma through active transport mechanism.[1,2] A smooth palpebral conjunctiva also contributes to the maintenance of corneal epithelial integrity by allowing the eyelids to move freely over the cornea, thereby providing protection and even distribution of the tear film on the cornea.

An affectation of any of the corneal histological layers by a range of diseases can cause corneal opacity, and this may eventually lead to corneal blindness.[3,4] The common causes of corneal blindness are microbial keratitis, trauma, traditional eye medication (TEM), xerophthalmia, ophthalmia

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neonatorum, trachoma, onchocerciasis, leprosy, corneal dystrophy and degeneration.[5-7]

Microbial keratitis is a common cause of ocular morbidity in developing countries.[8,9] The causative organisms involved are mainly bacteria such as *Streptococcus pneumoniae*, *Staphylococcus* species, *Pseudomonas aeruginosa* and fungi.[9-11] Injudicious use of steroid-containing eye drops also contributes to the high prevalence of corneal blindness from microbial keratitis in developing countries.[12] The use of TEMs such as breast milk and urine is an important risk factor for corneal ulceration and blindness.[13,14] TEM are often contaminated and serve as media for the growth of microorganism.

The burden of corneal blindness from trauma is significant in developing countries where manual labour, insurgences and civic unrest are common.[15,16] Corneal injuries with subsequent scarring from the injuries may result in a variable amount of blindness, and it is a major cause of monocular blindness.[17,18]

Trachoma is the most common infectious cause of blindness, and it is responsible for blindness in about 1.3 million people worldwide.[19] Repeated infection of the individual by Chlamydia trachomatis leads to recurrent chronic conjunctiva inflammation and associated development of scar tissue within the conjunctiva over many years. Contraction of scar tissue within the palpebral conjunctiva results into the formation of trichiasis and subsequently corneal blindness.[19] This condition is common in communities that lack basic needs such as housing, health, water and sanitation.[20,21] There has been a global reduction in recorded trachomatous blindness due to improvement in socio-economic conditions and implementation of the SAFE (surgery, antibiotic, facial washing and environmental sanitation) strategy.[22-24]

Onchocerciasis is a major cause of blindness in many African countries.[25-28] It is an insect-borne disease caused by the parasite Onchocerca volvulus, and it is transmitted by the black flies of the species *Simulium damnosum*.[29] It is estimated that there are about half a million people who are blind due to river blindness.[30] Ocular lesions can involve all eye tissues, ranging from punctate and sclerosing keratitis to optic nerve atrophy. Much progress has been made in controlling the disease in many countries including Nigeria through the control of the vector and the usage of a drug called Ivermectin.[29] Corneal blindness can also result from leprosy infection. Lagophthalmos and diminished corneal sensation in infected individuals predispose them to exposure keratopathy, which might eventually result in corneal opacity.[31,32] Leprosy is now better controlled with the use of multi-drug therapy, which are being supplied by the governmental and non-governmental agencies.[33,34]

Childhood blindness in developing countries is often due to corneal opacity as a result of measles infection and vitamin A deficiency.[35-37] Measles is a highly contagious disease caused by a virus in the paramyxovirus family, and it is normally spread by coughing and sneezing, as well as direct contact with infected nasal or throat secretions. The virus infects the mucous membranes and then spreads throughout the body.[37] Strategies such as measles immunization, health education and control of vitamin A deficiency have led to a significant reduction in childhood blindness in many countries.[38]

Corneal blindness can also occur from other corneal pathologies such as pterygium, vernal keratoconjunctivitis, bullous keratopathy following intraocular surgery, especially cataract surgery, congenital corneal abnormality, corneal dystrophy and degenerative diseases of the cornea.[17,39,40]

Worldwide, the diseases affecting the cornea are the major cause of blindness,[5,41] and they are the common cause of ocular morbidity in developing countries.[7,39] The burden of corneal blindness on the individual and the community at large may be enormous. The younger age groups in their active and productive periods are more affected compared to the elderly who are affected mostly by cataract; hence, the socio-economic impact of corneal blindness is greater than cataract in terms of the total blind-person years.[17,38] The magnitude is more in low- and middle-income countries, mainly because of the high risk of ocular trauma from contaminated objects such as vegetative matter, poor accessibility to good eye care and persistence of communicable diseases such as trachoma, onchocerciasis and leprosy, which have been eradicated in developed countries.[19,42-44]

The cause of corneal blindness is diverse and highly dependent on the ocular diseases that are prevalent in each geographical region.[5,7,45] The magnitude and pattern of blindness in children vary according to the socio-economic development of the community and the availability of health care services for children.[36] Children who take a balanced diet with good accessibility to immunization are less likely to be corneal blind.[46,47] Childhood blindness in the poor regions of the world are often due to corneal opacity; globally, about three-quarters of the children who are blind live in the poorest regions of sub-Saharan Africa and Asia.[36] The aim of this study was to determine the prevalence and associated determinants of corneal blindness in a semi-urban population. The study is a part of a larger survey on the prevalence of avoidable blindness among the studied population, and this is the first report from the survey.

Materials and Methods

The population-based survey was conducted in the month of March and April 2014 in a semi-urban population of Ido Local Government Area (LGA) of Oyo state, Southwest Nigeria. Ido LGA is one of the 33 LGAs of Oyo state. Ido

LGA is a semi-urban area with some rural settlements and is located in the rainforest climatic belt of Nigeria within latitude 7.50678 N and longitude 3.71186 E. It is bounded in the north by Afijio LGA, in the west by Ibarapa East LGA, in the east by Akinyele LGA and in the south by Odeda LGA of Ogun state. It is divided into 10 political wards; these wards are composed of a variable number of settlements such as Awotan, Omi, Gbekuba, Odebode and Elere. There is an average of about twenty settlements per ward. The people in this local government are mainly farmers, artisans, traders and civil servants. The main dietary intake of the people in the LGA is carbohydrates such as yam, yam flour (Amala) and rice. The major source of proteins, minerals and vitamins in the LGA are bush meats, beans, palm oils, mangoes and oranges.

There are 10 health districts in the local government. Each district has two Primary Health Care Centres run by the local government authority. The primary health centres take care of some ailments and coordinate the immunization services in the local government. An immunization clinic is run twice in a week in all the primary health centres in the LGA, where free vaccines including for measles are given to the children. The vaccines are kept inside refrigerators, and the cold chain system is being maintained with the usage of solar energy to augment the energy supply by the Power Holding Company of Nigeria. The local government authority also organizes mass immunization campaigns and vitamin A supplementation twice in a year for the children within the LGA.

Ethical approval was obtained from the ethical committee of the University College Hospital Ibadan before the commencement of the study. Informed consent was obtained from the participants. The study was conducted among the participants aged 5 years and above who had been living in the LGA for a period of at least 1 year prior to the survey.

The minimal sample size was determined using Leslie Kish statistical formula, because it was a cross-sectional study in a large population.[48] Furthermore, $n = Z_\alpha{}^2pq/d^2$, $Z_\alpha = 1.96$, normal standard deviation was at 95% confidence interval (CI), $P =$ the proportion of the target population estimated to have the particular characteristic (for this study, it was estimated to be 50% = 0.5), $q = 1 - p$ and $d =$ absolute level of precision, which was set at 5% for this study. Thus, $n = 1.96^2 \times 0.50 \times 0.50/0.05^2 = 384.16$. Assuming a cluster design effect of two and accounting for 15% non-response rate, a minimum sample size of 905 was estimated for this study.

Multi-stage sampling with probability proportional to size procedure was used to select a cross-sectional representative sample of the population.

Stage 1: The survey was performed in five of the 10 political wards, which were selected using simple random sampling (balloting).

Stage 2: A list of settlements in each ward was obtained from the local government, and three settlements were selected in each of the five wards chosen in the aforementioned stage 1. A simple random technique was used for selection.

Stage 3: In each settlement, every second cluster of houses with eligible individual(s) was selected. The first house was determined by spinning a bottle at the centre of the settlement. For the selected cluster of houses in which there were no eligible individuals, the next cluster with eligible individuals was selected. Subsequent houses along the same direction were sampled and eligible respondents recruited until the required population sample size was obtained using probability proportional to size procedure.

Stage 4: All respondents in the sampled houses who met the inclusion criteria were enumerated after consent was obtained.

A door-to-door enumeration was conducted during which the local guide confirmed whether a participant fulfilled the eligibility criteria. The age of the respondents who were not sure of theirs was determined by the use of historic events such as the Nigerian independence.

Structured semi-closed questionnaires were then administered by the trained field assistants to elicit demographic data such as age, sex, occupation, marital status, educational level and religion. Ocular histories such as prior eye surgery, eye trauma, the redness of the eye with or without pain, history suggestive of measles, trachoma, onchocerciasis and leprosy were also elicited from the participants. The questionnaire was translated to the native language (Yoruba) of the illiterate participants for better understanding.

The visual acuity (VA) of each eye of the respondents was tested by trained assistants using a Snellen chart or an Illiterate E chart depending on the literacy level of the respondents. The chart was placed at 6 m from the participant in a shaded open space in daylight; each eye was tested separately. Further VA assessment was performed in the participants with VA less than 3/60 by counting fingers, hand movement and light perception, as appropriate. An ocular examination was performed on all participants in a room provided by the participants. The anterior segments of all the participants were examined with the aid of a pen torch and 4× magnifying loupe; direct ophthalmoscopy (Welch Allyn) was performed to assess the posterior segment. A detailed examination, which included slit lamp (Haag-Streit, Switzerland) examination, was conducted on the participants with a VA of less than 3/60 at the base vision centre as appropriate.

Corneal blindness was defined as presenting a VA of less than 3/60 due to corneal disease in the affected eye. The following features were used as guidelines in identifying some of the probable causes of corneal opacity among the participants during the survey:

(1) The participants or their family members were asked about the specific causes of corneal diseases such as trauma, measles, TEM and eye surgery.
(2) Corneal opacity from previous microbial keratitis was identified based on the history of prior symptoms such as marked pain, redness, discharge and photophobia in the involved eye, which resolved with or without treatment.
(3) Corneal opacity from trachoma was identified based on the presence of trichiasis with pannus and/or a history of epilation for trachomatous corneal opacity.
(4) The presence of skin lesions such as hypopigmented skin changes and onchocerca nodule was used to identify corneal opacity from onchocerciasis.
(5) Congenital causes were identified based on a history of being born with corneal opacity.

All respondents who required further and detailed evaluation were referred to the eye clinic of the University College Hospital with a referral form, whereas the participants with minor ocular conditions were counselled and treated.

The data collected were entered into a database and analyzed using the Statistical Package for Social Sciences software version 22 (IBM Corp., New York, NY, USA). Summary statistics was presented using frequency tables, charts, means and rates. Chi-square test for qualitative variables was used to test for association. The level of statistical significance was set at 5%, and 95% CI of the blindness rates was obtained.

Results

A total of 1002 participants were studied. The mean age of the participants was 43 (±17) years, and their age range was between 5 and 90 years. The highest number of participants (251; 25%) was in the age group of 45–50 years, as shown in Table 1. There was a slightly lower number of males (410; 40.9%) compared to females (592; 59.1%). The majority (69.7%) of the participants had at least secondary school education. Females had a higher level of education. Three hundred and forty-seven participants (34.6%) in this study were traders, whereas students accounted for 16.8% of the participants.

There was no case of absolute blindness (nil perception of light) from corneal diseases in the study; 13 eyes (0.7%; 95% CI: 0.3–1.0) had a VA of <3/60 to light perception from corneal diseases, and six eyes (0.3%; 95% CI: 0.1–0.5) had moderate visual impairment (<6/18 to 6/60). Eleven participants (1.1%; 95% CI: 0.5–1.7) (13 eyes) had corneal blindness. Two (0.2%) participants had bilateral corneal blindness, whereas nine (0.9%) had unilateral corneal blindness. The 2006 National Population Census showed that the studied LGA had a projected population of 104,087 and that people aged 5 years and above accounted for 87.3% of the population. With this projection, it was estimated that approximately 999 individuals had corneal blindness in at least one eye and 182 individuals had bilateral corneal blindness among the people aged 5 years and above in the local government, and corneal graft might be beneficial to them.

The most common cause of corneal blindness in the study as shown in Table 2 was post-microbial keratitis (36.4%) followed by trauma (27.2%). Measles and allergic keratoconjunctivitis were identified as the cause of bilateral corneal blindness in the study.

Corneal blindness accounted for 9.6% of bilateral blindness and 20.4% of unilateral blindness, as shown in Figure 1. Table 3 shows that the proportion of participants with corneal blindness was more in the age group of 56 years and above. The prevalence increased with age, but there was no significant association between the age group and corneal blindness ($P > 0.05$). The prevalence of corneal blindness was more in males than in females, but the association was not statistically significant ($P > 0.05$), as shown in Table 4. The prevalence of corneal blindness in at least one eye was higher among the respondents with lower educational level compared to the respondents who had at least secondary school education [Table 4]. The association between corneal blindness and educational status was statistically significant ($P < 0.05$). Corneal blindness was seen among the different occupational categories of

Table 1: Distribution of the participants by age group and gender

Age (years)	Total	Males	Females
	N (%)	*N* (%)	*N* (%)
5–15	101 (10.0)	60 (5.9)	41 (4.1)
16–25	83 (8.3)	36 (3.6)	47 (4.7)
26–35	107 (10.7)	39 (3.9)	68 (6.8)
36–45	239 (23.9)	65 (6.5)	174 (17.4)
46–55	251 (25.0)	105 (10.5)	146 (14.5)
56–65	143 (14.3)	67 (6.7)	76 (7.6)
Above 65	78 (7.8)	38 (3.8)	40 (4.0)
Total	1002 (100.0)	410 (40.9)	592 (59.1)

Table 2: Distribution of the causes of corneal blindness

Causes of cornea blindness	Frequency	Percent (%)
Post-microbial keratitis	4	36.4
Trauma	3	27.2
Measles	1	9.1
Post-eye surgery	1	9.1
Pterygium	1	9.1
Allergic keratoconjunctivitis	1	9.1
Total	11	100.0

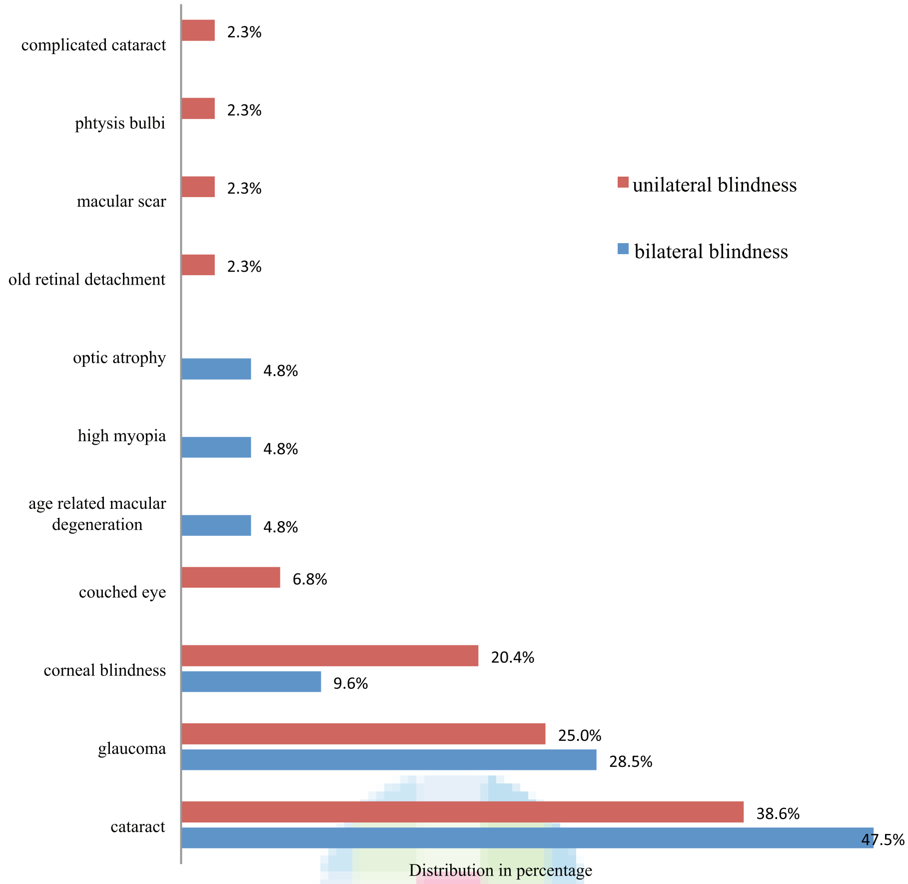

Figure 1: Distribution of the causes of blindness in the survey

Table 3: Prevalence of corneal blindness by age group

Age group (years)	Corneal blindness in at least one eye	Corneal blindness	Total
	Present	Absent	*N* (%)
	N (%) (95% CI)	*N* (%)	
5–15	1 (1.0) (−0.9 to 2.9)	100 (99.0)	101 (100.0)
16–25	2 (2.4) (−0.9 to 5.7)	81 (97.6)	83 (100.0)
26–35	1 (0.9) (−0.9 to 2.8)	106 (99.1)	107 (100.0)
36–45	1 (0.4) (−0.4 to 1.2)	238 (99.6)	239 (100.0)
46–55	1 (0.4) (−0.4 to 1.2)	250 (99.6)	251 (100.0)
56–65	3 (2.1) (−0.3 to 4.5)	140 (97.9)	143 (100.0)
Above 65	2 (2.6) (−1.0 to 6.1)	76 (97.4)	78 (100.0)

$\chi^2 = 6.3$, *P*-value = 0.39.

respondents in the survey, as shown in Table 4. The prevalence of corneal blindness was highest among the farmers and least among the students and the artisans. The association between occupational status and corneal blindness was statistically significant (*P*-value <0.05).

Discussion

The prevalence of corneal blindness in both the eyes, one eye and at least one eye in this study were 0.2% (95% CI: −0.8 to 0.5), 0.9% (95% CI: 0.3–1.5) and 1.1% (95% CI: 0.5–1.7) respectively. Corneal blindness accounted for 9.6 and 20.4% of bilateral and unilateral blindness, respectively. The most common causes of blindness in the area were corneal opacity from microbial keratitis (36.4%) and ocular trauma (27.2%). The study showed that the prevalence of corneal blindness was higher among the older participants, male gender and people with lower educational status.

The magnitude of corneal blindness in the studied area was substantial. The projected number of individuals that were corneal blind in at least one eye in the target population was approximately 999, and these individuals may benefit from corneal graft if appropriate measures are instituted. Corneal blindness is a public health problem; the findings of this study can serve as the

Table 4: Prevalence of corneal blindness by gender, education and occupation

Demographic variables		Corneal blindness in at least one eye	Corneal blindness	Total
		Present	Absent	*N* (%)
		N (%) (95% CI)	*N* (%)	
Gender	Male	7 (1.7) (0.5 to 3.0)	403 (98.3)	410 (100.0) $\chi^2 = 2.4$, $P = 0.12$
	Female	4 (0.7) (0.2 to 1.3)	588 (99.3)	592 (100.0)
Educational status	Below secondary	10 (2.9) (1.1 to 4.7)	334 (97.1)	344 (100.0) $\chi^2 = 15.8$, $P < 0.05$
	Secondary and above	1 (0.2) (−0.1 to 0.4)	657 (99.8)	658 (100.0)
Occupational status	Pupil/student	1 (0.6) (−0.6 to 1.8)	167 (99.4)	168 (100.0) $\chi^2 = 32.4$, $P < 0.05$
	Farming	5 (11.9) (2.1 to 21.7)	37 (88.1)	42 (100.0)
	Artisan	1 (0.6) (−0.6 to 1.8)	167 (99.4)	168 (100.0)
	Trading/business	4 (1.2) (0.3 to 2.3)	343 (98.8)	347 (100.0)

basis for appropriate eye health care planning and prioritization of the available health resources towards reducing the incidence of corneal blindness in the local government.

The prevalence of bilateral corneal blindness was 0.2% (95% CI: −0.8 to 0.5) in our study. A similar prevalence was noted by Li *et al.*,[49] whereas a lower prevalence was reported by Wang *et al.*[50] and Dandona *et al.*[51] The lower prevalence in their studies could be attributed to the difference in methods (sample size and usage of LogMAR chart). Snellen chart was used in this study, though VA assessment has been found to be significantly better with LogMAR chart, and it is preferable for a population-based study.[52]

The prevalence of unilateral corneal blindness in our study was 0.9% (95% CI: 0.3–1.5). Several studies[49-51] have shown that most blindness of corneal origin are unilateral. Wang *et al.*[50] and Dandona *et al.*[51] reported lower prevalence probably due to similar reasons as aforementioned for the difference in the prevalence of bilateral corneal blindness. Periodic health education on the need for timely visitation to an eye specialist when the need arises (especially for individuals who are already blind in one eye) should be conducted by the community health workers in the local government.

Corneal blindness accounted for 9.6% of total blindness in this study, but higher percentages of 13.7 and 20.8% were noted in the Nigeria National Blindness Survey[40] and in the survey conducted in southern Ethiopia,[53] respectively. A higher magnitude of corneal blindness reported in these studies[40,53] could be attributed to the involvement of the trachoma endemic zone in the studied populations unlike this study.

The most common cause of corneal blindness in this study was corneal opacity from microbial keratitis (36.4%), followed by ocular trauma (27.2%). This is similar to the reports from other population-based studies in developing countries.[17,49,50] This finding could be attributed to similar risk factors such as an increased risk of ocular trauma from farming activities and poor accessibility to affordable and qualitative eye care. Primary eye care services should be integrated to primary health care programme in this area for prompt and easy accessibility to eye care by the inhabitants of these communities.

Corneal blindness was associated with increasing age in this study, and this result is consistent with reports from other studies.[17,39,50] A higher prevalence of corneal blindness was found among the participants older than 50 years. Wang *et al.*[50] also reported that the older age group was associated with an increased prevalence of corneal blindness. This age group engaged more in farming activities, which predispose them to corneal injury. The magnitude of childhood blindness from corneal diseases in this study was low; this could be attributed to the wide and effective coverage of the National and routine immunization programmes for preventable diseases such as measles in the area. The only case of blindness from measles in this study was in a participant who was above 56 years of age; this was similar to the findings of the Andhra Pradesh Eye Disease Study,[17] wherein 42.1% of the participants who were blind from keratitis due to exanthematous fever that occurred in childhood were 50 years of age and above. The public health education on the importance of measles and vitamin A immunization should be sustained in the local government.

The prevalence of corneal blindness was higher among the male participants in this study. Similar findings were reported by Li *et al.*[49] in a rural Chinese population and in the Andhra Pradesh Eye Disease Study.[17] Ashaye and Oluleye[39] in Ibadan also found a higher magnitude of corneal opacity among males in a hospital-based study. Consistent with findings reported by Fasina[54] in Ibadan, the male participants in the age group of 16–35 years in this study were unilaterally blind due to work-related ocular trauma. Several studies[15,55] have also reported a high frequency of ocular trauma among the male gender. However, more female participants had corneal blindness in the Nigeria National Blindness Survey[40] than the male participants. This is consistent with the findings of Wang *et al.*[50] among the Chinese and Negussie and Tilahun[53] in Ethiopia. Women in these regions were said to be agriculturally active, and it predisposed them to the same risk of having corneal blindness as men. Women are also more predisposed to corneal blindness from trachoma,[20] and this could be attributed to the findings from the Ethiopia study, wherein trachoma was endemic.

There was a higher prevalence of corneal blindness among the participants with lower educational status in our study. A similar finding was noted by other studies.[17,39,50] This could be attributed to poor eye care among this set of people and probably increased susceptibility to eye injury from farming activities.

The prevalence of corneal blindness was highest among farmers in this study; this is consistent with other population-based studies[17,40,56] in rural communities, wherein agricultural practices were common, and this was attributed to increased exposure to risk factors such as trauma and contact with the black flies that transmit onchocerciasis. The promotion of preventive safety measures such as the use of protective goggle at the workplace should be encouraged to prevent corneal blindness among the people performing high-risk work.

The limitations of the study involved difficulty in assigning the causes of corneal blindness in few participants, because they could not give accurate ocular history and a further diagnostic test such as ocular ultrasound could not be performed on the respondents with hazy fundus due to financial constraints. There was difficulty getting the precise age of some respondents at times despite using historic events; therefore, an approximate age was used. VA assessment could have been better with the LogMAR chart instead of the Snellen chart that was used in this study. Only 11 participants had corneal blindness in the study, and a larger sample size will be more informative for an uncommon entity such as corneal blindness.

Since the determinants associated with corneal blindness in the communities are known, adequate measures should be instituted and directed appropriately towards the identified determinants so as to reduce the incidence of corneal diseases in the area. However, further study on the acceptability of corneal graft by the corneal blind participants in the community is recommended before embarking on such an intervention programme.

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Conflicts of interest

There are no conflicts of interest.

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Appendix 1

Questionnaire for prevalence and determinants of corneal blindness in a semi-urban population of Southwest Nigeria

Serial number ……………………..

A. SOCIO DEMOGRAPHY DATA

1. Age (last birthday) …………………………………
2. Sex: (1) Male (2) Female
3. Marital Status

   (1) Single (2) Married (3) Separated (4) Divorced (5) Widowed
4. Educational level

   (1)No formal education (2) Quranic education (3) Primary education (4) Secondary education (5) Tertiary education
5. Occupation

   (1) Student (2) Farming (3) Artisan (4) trading (5) Civil servant (6) Others- specify
6. Religion (1) Christianity (2) Islam (3) Traditional (4) Others -specify

B.

1. Ocular history (1) measles (2) Glaucoma (3) In turned lashes (4) History of ocular surgery-specify (5) painful red eye with or without discharge (6) History of use of TEM- specify (7)Hazy cornea from birth (8) Trauma
2. If trauma, Specify causes: (1) Flying/thrown object, (2) Explosive, (3) Vegetable matter, (4) Chemical, (5) Fall/RTA, (6) Tool, (7) Others-specify
3. Place of trauma: (1) home, (2) work, (3) school, (4) while playing (5) other-specify

C: EXAMINATION **RE** **LE**

1. Presenting VISUAL Acuity RE ☐ LE ☐

   (1)6/6-6/12 (2) 6/18-6/60 (3) 3/60-light perception (4) No light perception
2. If light perception or hand movement, Accurate light projection? Yes-1 No-2
3. Corrected visual acuity with pin-hole RE ☐ LE ☐

   (1) 6/6-6/12 (2) 6/18-6/60 (3)<6/60-3/60 (4) NI

4. Examination; Evidence of: trachoma (1) yes (2) no, Onchocerciasis (1) yes (2) no
5. Lids (1) normal (2) abnormal RE LE

   If abnormal specify……………………………………..

6. Conjunctiva (1) normal (2) abnormal RE LE

   If abnormal specify…………………………………..

7. Cornea opacity RE LE

   a. (1) yes (2) no

   b. details if yes...............

   c. other corneal disease (1) yes (2) no

   d. detail if yes……………..

8. Normal anterior chamber/iris details (1) yes (2) no (3) no view RE LE

9. Lens (1) clear (2) cataract (3) aphakia (4) pseudophakia (5) others specify… RE LE

10. Fundus (1) normal (2) abnormal RE LE

    a. If abnormal specify………………………………

    b. CDR RE LE

11. Probable Diagnosis……………………….. causes…………risk factors…………

D. First Choice of facility when there was an eye complaint ☐

(1) Traditional eye care giver (2) patent medicine seller (3) self medication (4) hospital

Reasons for above ☐

It was cheaper -1

It was closer -2

It was better -3

It was recommended -4

Others specify -5…………………