

Visual impairment and blindness among elderly in rural area of North Karnataka – A cross-sectional study

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ABSTRACT

Background: Loss of sight of a person should not remain just a statistic but a personal tragedy, not only for the individual concerned but for all of us who claim to be concerned. With the introduction of universal eye health: A global action plan 2014–2019, dealing with a reduction in avoidable blindness across the world, this study would help in enlightening the present scenario in this region. **Objective:** The objective of the study was to know the prevalence of visual impairment and blindness among elderly in a rural area. **Materials and Methods:** All individuals aged 60 years and above residing in the area covered under Vantamuri Primary Health Centre (PHC), Belagavi, were selected for the study. A sample size of 620 was calculated and obtained by population proportionate sampling from five subcenters under Vantamuri PHC. Sociodemographic data were collected from the study subject with the help of pre-designed and pre-tested questionnaire and detailed ocular examination was carried out. Ethical clearance was obtained from the Institutional Ethics Committee. **Results:** The prevalence of visual impairment and blindness in our study was 28.07% and 2.90%, respectively. Female constituted more than half (61.11%) of blind individuals, whereas male (51.39%) dominated visual impairment. Cataract was the most common cause of visual impairment and blindness. **Conclusion:** Blindness was more common among elderly female compared to male. Cataract being the most common cause for visual impairment, it can be prevented by more coverage and better health care services in the rural area.


KEY WORDS: Blindness; Rural Area; Visual Impairment

INTRODUCTION

Globally, 285 million people are visually impaired, of whom 246 million have low vision, 39 million are blind. About 90% of the world's visually impaired live in low-income settings.^[1] World's one-third blind people live in the South-East Asia region. Four of every 12 people who become blind every minute in the world are from South-East Asia. The life expectancy of the blind persons is one-third less than that

of their sighted peers, and most of them die within 10 years of becoming blind.^[2] India has 6.7 million blind people and the estimated national prevalence of blindness in the general population is 1%. Of the blind people, 82% are above the age of 50 years.^[3]

The preventable causes of blindness are as high as 80% of the total global burden and are mainly seen in developing countries.^[4] The major reasons for the high prevalence of ocular morbidity in India may be increasing life expectancy, significantly more people aged above 40 years, poor access to eye care facilities in rural areas, misconceptions about cataract surgery, compromised water quality and environmental conditions, and lack of effective eye health education program.^[5] As most of the causes for blindness are preventable, there is a need to control the above-mentioned factors by checking ocular diseases in early stages.^[6]

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Permanent visual disability can be prevented by giving necessary treatment in early stages.^[7]

Although there are various programs and strategies coming up, preventable blindness is reducing on a slower pace. This is mainly due to the illiteracy and ignorance of the people toward their health and health-related conditions.^[8] Many elderly individuals do not even know if they are suffering from any illness because it hardly affects their daily routine. This increases the burden of ocular diseases. So to bring a reduction of preventable blindness on a better pace, more of screening studies and camps need to be conducted where we can focus on elderly individuals, can treat them, and bring blindness with other morbidities to a halt.

In developing countries, data regarding the prevalence of ocular morbidities among the elderly in rural areas are scarce. Such studies will be beneficial in formulating programs to further reduce the burden of visual impairment and help in achieving Vision 2020: Right to Sight, global initiative to eliminate avoidable blindness, initiated by the World Health Organization (WHO). With the introduction of universal eye health: A global action plan 2014–2019, dealing with a reduction in avoidable blindness across the world, this study would help in enlightening the present scenario in this region. With this background, the present study was conducted among the elderly in the rural area of Belagavi to know the prevalence of visual impairment and blindness.

MATERIALS AND METHODS

The present community-based cross-sectional study was conducted among individuals aged 60 years and above, residing in the area covered under Vantamuri Primary Health Centre (PHC), Belagavi, from January to December 2016. The study was approved by the Institutional Ethical Committee of Jawaharlal Nehru Medical College, Belagavi. (MDC/DOME/377 dated: 18/11/2015). A sample size of 620 was calculated from the prevalence seen in previous studies done in India. Sample size obtained by preparing a sampling frame by sorting out individuals aged 60 years and above from the voters' list of five subcenters under Vantamuri PHC. Study participants were further chosen using the Random number table.

The data were collected from the study subject regarding sociodemographic variables, alcohol and tobacco consumption, indoor air pollution and previous history of diabetes, hypertension, or any ocular surgeries. The detailed ocular examination was carried out, which included external eye examination using torch and visual acuity examination. Refractive error was crudely estimated from lens power readings of the ophthalmoscope. With the help of pre-designed and pre-tested questionnaire, elderly individuals were interviewed face to face and data collection was done by the house to house visit after taking informed consent. The

data were coded and entered in the Microsoft excel sheet. Data were analyzed using Statistical Package for Social Sciences, version 24.0 and the prevalence was expressed in terms of percentages.

RESULTS

A total 620 participants aged 60 years and above participated in the study. Of the 620 study participant, 367 (59.19%) were female and 253 (40.81%) were male. Among 253 male participant, the majority (62.06%) were in the age group of 60–65 years. Of 367 female participant, almost two-third (65.39%) were in the age group of 60–65 years and the lowest (1.09%) were in the age group of 76–80 years. The mean age of the study participant was 65.26 ± 6.04 years. The mean age of the male and female participants was 65.45 ± 5.94 and 65.12 ± 6.11 years, respectively. In the present study, among 253 male and 367 female participant, 121 (47.83%) and 176 (47.96%) were illiterate, 85 (33.60%) and 143 (38.96%) had completed primary schooling, 29 (11.46%) and 25 (6.81%) had completed secondary schooling, 13 (5.14%) and 20 (5.45%) had completed education till pre-university, and 5 (1.97%) and 3 (0.82%) had completed their graduation.

In the present study, of 253 male and 367 female participants, 65 (25.69%) and 9 (2.45%) had retired from their service, 135 (53.36%) and 81 (22.07%) were farmer, 53 (20.95%) and 25 (6.81%) were working in an industry, and 252 (68.67%) female were housewives. In the present study, 579 (93.38%) of subjects were Hindus, 35 (5.65%) were Muslim, and 6 (0.97%) were Jain. Of the 620 study participant, 4 (0.64%) were unmarried and 616 (99.36%) were married. About 166 (26.77%) study subjects were staying in a nuclear family, 422 (68.06%) in joint family and 32 (5.17%) had broken family. Nearly 120 (19.35%) participant belonged to Class I of modified B. G. Prasad classification, 38 (6.13%) to Class II, 180 (29.04%) to Class III, 221 (35.64%) to Class IV, and 61 (9.84%) to Class V [Table 1].

According to the WHO classification of visual acuity, 428 (69.03%) participants had normal vision, 144 (23.23%) had visual impairment, 30 (4.84%) had severe visual impairment, and 18 (2.90%) participants were blind. Among 144 participants with visual impairment, 74 (51.39%) were male and 70 (48.61%) were female. Severe visual impairment constituted 13 (43.33%) male and 17 (56.67%) female. Blindness constituted to 7 (38.89%) male and 11 (61.11%) female respectively. According to International Classification of Diseases – 10 (ICD – 10) classification of visual acuity, 428 (69.03%) participants were under category 0, 144 (23.23%) under category 1, 30 (4.84%) under category 2, 10 (1.61%) under category 3, 3 (0.48%) under category 4, and 5 (0.81%) under category 5. Under blindness, of 10 participants in category 3, 4 were male and 6 were female. In category 4 of 3, 1 was male and 2 were female. Among 5 study participants in category 5 blindness, 2 were male and 3

were female. According to Indian NPCB classification, 428 (69.03%) participant had normal vision, 144 (23.23%) had low vision and 48 (7.74%) had blindness [Table 2].

DISCUSSION

In the present study, among male participants, nearly two-thirds (62.06%) were in the age group of 60–65 years followed by 21.74% in the age group of 66–70 years. A similar trend was seen in female where almost two thirds (65.39%) were in the age group of 60–65 years, more than one-fifth in (20.71%) in the age group of 66–70 years. Female preponderance was seen as most of the women, especially in rural areas, tend to be at home during the daytime and was available for interview. Among 367 female participants, illiterates were almost similar as male (47.96%), but those who had completed primary schooling were a bit better compared to male (38.96%). Although the majority of illiterates were female, they even dominated among participants who had completed schooling. The present study revealed that majority of male participants (53.36%) were farmers and more than two-thirds (68.67%) of the female participant were housewives. India being known as an agricultural country, it was good to know that more than 50% participant was indulged in farming even

at this age. The study area included an industrial estate, so some of the participants were working in industries.

As our study was conducted in an area predominantly occupied by Hindus, 93.38% of subjects were Hindus, 5.65% were Muslim, and 0.97% were Jain. Of the study participant in the current study, almost all study participants were married except 4 (0.64%). It noteworthy that majority (68.06%) of the study subject lived in a joint family compared to nuclear family. Joint families were more as urbanization and nuclear family trend has not yet influenced the rural areas. In our study, 35.64% belonged to Class IV socioeconomic status according to modified B. G. Prasad Classification. 29.04%, 19.35%, 9.84%, and 6.13% participant belonged to Class III, Class I, Class V, and Class II, respectively.

According to the WHO classification of visual acuity, it was good to know that in our study, nearly 69.03% had normal vision, 28.07% had visual impairment, and 2.90% participants were blind. Among 144 participants with visual impairment, more than half (51.39%) were male. This was subdued by female preponderance in a severe visual impairment which constituted 56.67% female. Blindness constituted to 38.89% in male and 61.11% in female, respectively. Cataract was the most common cause for blindness.

Table 1: Sociodemographic profile of study participants

Age (in years)	Male n (%)	Female n (%)	Literacy status	Male n (%)	Female n (%)
60–65	157 (62.06)	240 (65.39)	Illiterate	121 (47.83)	176 (47.96)
66–70	55 (21.74)	76 (20.71)	Primary school	85 (33.60)	143 (38.96)
71–75	28 (11.07)	30 (8.17)	Secondary school	29 (11.46)	25 (6.81)
76–80	4 (1.58)	4 (1.09)	PUC	13 (5.14)	20 (5.45)
>80	9 (3.55)	17 (4.64)	Degree	5 (1.97)	3 (0.82)
Total	253 (100)	367 (100)	Total	253 (100)	367 (100)

Socioeconomic status	Number (%)	Religion	Number (%)
Class I	120 (19.35)	Hindu	579 (93.38)
Class II	38 (6.13)	Muslim	35 (5.65)
Class III	180 (29.04)	Jain	6 (0.97)
Class IV	221 (35.64)	Total	620 (100)
Class V	61 (9.84)		
Total	620 (100)		

Table 2: Distribution of study participant according to their visual acuity (WHO classification, ICD-10 classification, and Indian classification)

Visual acuity	WHO classification number (%)	ICD – 10 classification number (%)	Indian classification number (%)
6/6–6/18	Normal 428 (69.03)	Category 0.428 (69.03)	Normal 428 (69.03)
6/18–6/60	Visual impairment 144 (23.23)	Category 1.144 (23.23)	Low vision 144 (23.23)
<6/60–3/60	Severe visual impairment 30 (4.84)	Category 2.30 (4.84)	Blindness 48 (7.74)
<3/60	Blindness 18 (2.90)	Category 3.10 (1.61)	
Light perception		Category 4.03 (0.48)	
No light perception		Category 5.05 (0.81)	
Total	620 (100)	620 (100)	620 (100)

WHO: World Health Organization, ICD – 10: International Classification of Diseases – 10

According to ICD – 10 classification of visual acuity, 69.03% were under category 0, 23.23% under category 1, 4.84% under category 2, 1.61% under category 3, 0.48% under category 4, and 0.81% under category 5. Under blindness, of 10 participants in category 3, 4 were male and 6 were female. In category 4, of 3, 1 was male and 2 were female. Among 5 study participants in category 5 blindness, 2 were male and 3 were female.

A study carried out in Wardha district showed the prevalence of low vision to be 32% and blindness to be 12.2%. Nearly 55.7% participants had normal vision, 6.4% had blindness, 5.6% had near-total blindness, and 0.2% had total blindness.^[9] Slightly lower findings were seen in our study, where 1.61% were blind, 0.48% had near-total blindness, and 0.81% had total blindness.

The Chennai glaucoma study revealed that 19.2% individual presented with visual impairment and 3.36% with blindness.^[10] Our study had a higher prevalence of visual impairment may be because of overcorrection or misdiagnosis as the researcher had only 1-month training in ophthalmology. A study conducted in Tirunelveli district reported presenting blindness according to Indian definition (<6/60 in both eyes) to be 11.0%. Cataract was the most common cause.^[11] In our study, 7.74% participant were found to be blind according to Indian definition which was almost similar. The study conducted in Bundelkhand showed 37.0% low vision and 13.7% blindness in study participant.^[12]

Our study had a marginally lower prevalence of visual impairment and blindness compared to various above-mentioned studies as the literacy levels in the southern part of India are better compared to the northern part, the treatment-seeking behavior and approach toward the disease changes, which may lead to better health care. The present study can be generalized to only the rural elderly population. It can be generalized to urban slums or urban population with caution. The ophthalmoscopic examination was carried out by a researcher who had training for 1 month. Hence, some retina changes may be missed or misdiagnosed. Some tests could not be performed like tonometry or precise refraction testing.

CONCLUSION

The prevalence of visual impairment and blindness was lower in our study area. Blindness was more common among elderly female compared to male. Cataract was the most common cause for visual impairment and blindness. The approach of people has to be changed regarding ocular morbidities and their effects. This can be done by repeated information, education, and communication activities targeting elderly individuals. Better screening techniques using simple diagnostic criteria can be utilized for training the field workers such as male health worker, female health

worker, and Accredited Social Health Activist for early detection of these conditions, easy referral, and treatment. Mobile health screening camps can be conducted. Public and private partnerships can be strengthened and more benefits can be given to the rural population for their betterment.

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