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Preet Khona
Department of Community Medicine, Gadag Institute of Medical Sciences, Gadag, Karnataka, India

Chandra Metgud
Department of Community Medicine, Jawaharlal Nehru Medical College, KAHER, Belagavi, Karnataka, India

Correspondence
Preet Khona
Department of Community Medicine, Gadag Institute of Medical Sciences, Gadag, Karnataka, India

Cataract and its associated risk factors among elderly population in a rural area of Belagavi: A cross sectional study

Preet Khona and Chandra Metgud

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Abstract
Background: The loss of sight of a person should not remain just a statistics but a personal tragedy, not only for the individual concerned, but for all of us who claim to be concerned. According to National Programme for Control of Blindness (NPCB) Pilot Survey 2001-2002, the prevalence of cataract in + 50 - year population was 62.6%. To assess the impact of the NPCB on reduction of avoidable blindness, this study would help in enlightening the present scenario in this region.
Material and Method: 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, Belagavi from 1st January to 31st December 2016. Data was collected from the study subject regarding socio-demographic variables and personal history, external eye examination was conducted.
Results: The prevalence of cataract among elderly population in rural area was 40.16%. Out of 249 participants who had cataract, 18 (7.23%) had it only in right eye, 19 (7.63%) had in left eye and 212 (85.14%) had cataract in both eyes. The risk factors for cataract included belonging to Muslim and Jain religion, lower literacy status and increased exposure to indoor air pollution.
Conclusion: The present cross sectional study, reveals that the prevalence of cataract among elderly in rural area in the past 15 years has reduced by about 20%. But still some socio-cultural factors prevail among the rural population like ignorance towards the effects of morbidity was the major setback for seeking treatment. Such behaviour was more common in elderly female, who were the most affected by it.

Keywords: Cataract, elderly population, rural area

Introduction
Vision helps us understand what is, rather than on what should be. If we are thinking on what you think should be, we can't help being dissatisfied. When we find the need of the present moment, we see its necessity. Blindness and visual impairment by its sheer magnitude forms an enormous problem, not only in human suffering, but also in terms of economical loss and social burden [1].
India has been labelled as an ageing nation with 8.6% of its population being more than 60 years old. In absolute terms the elderly population in India accounted for nearly 104 million in 2011 [2]. The proportion is likely to reach 12% in 2031 and 17% in 2051. The ageing population is a sign of successful development in medical sciences and technology, living standards, and education, but the elderly also raise unique social, economic, and clinical challenges, including a growing demand for increasingly complex healthcare services [3]. So, India is marching towards a future where the elderly population will be on rise [4]. According to National Programme for Control of Blindness (NPCB) Pilot Survey 2001-2002, the prevalence of cataract in + 50 - year population was 62.6% [5].
In India, of the total elderly population, two-thirds live in villages. Ocular morbidity is more common in rural area, female gender, and the poor. Ocular morbidities if untreated reduce quality of life and economic productivity. 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 [4].

The preventable causes are as high as 80 percent of the total global burden and are mainly seen in developing countries. The eye morbidity is multi-factorial; main causes being infections, poor nutrition and certain socio-cultural factors. Poor hygiene, sanitation and the climatic conditions can further aggravate the eye problems [6]. The role of smoking in cataractogenesis has been highlighted in various studies. Also alcohol consumption is a risk factor for cataract [7]. Approximately half the world's population and up to 90 percent rural households in developing countries still rely on unprocessed biomass fuels such as wood, dung and crop residues. It is believed that biomass fuel smoke results in the opacity of lens [8]. 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. Permanent visual disability can be prevented by giving necessary treatment in early stages. In 2017-18, under NPCBVI, 6324490 cataract surgeries and were conducted all over India. Of those, 392269 surgeries were conducted in Karnataka [9].

With introduction of universal eye health: a global action plan 2014–2019, dealing with 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 elderly population in rural area of Belagavi to know the extent of cataract.

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, Belagavi from 1st January to 31st December 2016. A sample size of 620 was calculated and obtained by population proportionate sampling from five subcentres under Vantamuri Primary Health Centre. The voters list of each subcentre was obtained. Sampling frame was prepared by sorting out individuals aged 60 years and above. Study participants were further chosen by using Random number table.

The elderly persons in the study population were interviewed at their homes. All the subjects were informed about the purpose of the study and after obtaining informed consent they were interviewed using pre-structured and pretested proforma. Data regarding socio-demographic variables, alcohol and tobacco consumption, indoor air pollution and previous history of diabetes, hypertension, or any ocular surgeries was collected.

The participant underwent external eye examination using torch light to identify any diseases of eye lids, lacrimal apparatus, conjunctiva, cornea and nystagmus. Each person was tested for visual acuity using Snellen's E charts (separately for distant and near vision). Any lenticular opacity visible with distant direct ophthalmoscope against a red reflex was labelled as cataract after external eye examination. The doubtful cases were referred for final diagnosis to ophthalmologist, KLE hospital, Belagavi.

The data was tabulated and analyzed using Statistical Package for Social Sciences (SPSS), version 24.0 and the prevalence of each risk factor was expressed in terms of percentages. Statistical analysis was done using Pearson's Chi- Square test to find out the association between ocular morbidities and risk factors. A probability value (p value) of less than 0.05 was considered as significant.

Results

A total 620 participants aged 60 years and above participated in the study, among which 367 (59.19%) were female and 253 (40.81%) were male. The mean ± SD age of the study participant was 65.26 ± 6.04 years. In the present study, among 253 male and 367 female participant, 121 (47.83%) and 176 (47.96%) were illiterate respectively. 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)

Table 1: Socio demographic 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	04 (1.58)	04 (1.09)	PUC	13 (5.14)	20 (5.45)
>80	09 (3.55)	17 (4.64)	Degree	05 (1.97)	03 (0.82)
Total	253 (100)	367 (100)	Total	253 (100)	367 (100)
Socio Economic 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	06 (0.97)	
Class IV	221 (35.64)		Total	620 (100)	
Class V	61 (9.84)				
Total	620 (100)				

In the present study, 232 (37.42%) participant were users of any form of tobacco, whereas 94 (15.16%) consumed alcohol; 132 (21.29%) subject were suffering from diabetes mellitus and 160 (25.80%) subject were suffering from hypertension. Regarding treatment seeking behaviour, 7 (15.91%) of them had undergone surgery in government hospital and 37 (84.09%) at private hospitals.

The prevalence of cataract in the present study was 40.16%. Out of 249 participant who had cataract, 18 (7.23%) had it only in right eye, 19 (7.63%) had in left eye and 212 (85.14%) had cataract in both eyes. Of them, 101 (40.56%) had immature and 148 (59.44%) had mature cataract respectively. Among the cataract cases 112 (44.98%) were male and 137 (55.02%) were female subjects.

In our study, the prevalence rate of cataract was highest (50.00%) among study participant of age group 76 to 80 years, followed by 71 to 75 years (48.28%). The study results reveal that the prevalence rate of cataract gradually

increases from 60 years of age to 80 years. Though slightly more number of cataract cases was seen among male participant, sex of the study subject was not significantly associated with prevalence rate of cataract. The occupation of study subject was not significantly associated with prevalence rate of cataract.

The least (38.34%) prevalence rate of cataract was noted among study subject belonging to Hindu religion. There was statistically significant difference in the prevalence rate of cataract between Hindus and Non Hindus. ($\varkappa^2$ = 12.06, p = 0.002) In the present study, out of 297 illiterate study subject, 148 (49.83%) had cataract and 149 (50.17%) did not have. The prevalence rate of cataract was 31.14%, 31.48% and 36.36% among study participants who had education upto primary, secondary and PUC level respectively. Out of 8 participant who were degree holders only 1 (12.50%) had cataract. So as the literacy status of the participant increased, the prevalence rate of cataract decreased significantly. ($\varkappa^2$ = 23.72, p = 0.00009) In the present study, among 176 participant who had indoor air pollution at their home, 85 (48.29%) had cataract and 91 (51.71%) did not have. Out of 444 study participant who did not have indoor air pollution at their home, 164 (36.94%) had cataract and 280 (63.06%) did not have. Indoor air pollution was significantly associated with the prevalence rate of cataract among study participant. ($\varkappa^2$ = 6.77, p = 0.009) (Table 2 and 3)

Table 2: Association between religion, literacy status of study participant and prevalence of indoor air pollution with cataract

Cataract				
Religion	**Present N (%)**	**Absent N (%)**	**Total N (%)**	
Hindu	222 (38.34)	357 (61.66)	579 (100)	$\varkappa^2$ = 12.06, df = 2, p = 0.002
Muslim	23 (65.71)	12 (34.29)	35 (100)	
Jain	04 (66.67)	02 (33.33)	06 (100)	
Total	249 (40.16)	371 (59.84)	620 (100)	
Literacy Status	Present N (%)	Absent N (%)	Total N (%)	
Illiterate	148 (49.83)	149 (50.17)	297 (100)	
Primary	71 (31.14)	157 (68.86)	228 (100)	
Secondary	17 (31.48)	37 (68.52)	54 (100)	$\varkappa^2$ = 23.72, df = 4, p = 0.00009
PUC	12 (36.36)	21 (63.64)	33 (100)	
Degree	01 (12.50)	07 (87.50)	8 (100)	
Total	249 (40.16)	371 (59.84)	620 (100)	
Indoor Air Pollution	Present N (%)	Absent N (%)	Total N (%)	
Present	85 (48.29)	91 (51.71)	176 (100)	$\varkappa^2$ = 6.77, df = 1, p = 0.009
Absent	164 (36.94)	280 (63.06)	444 (100)	
Total	249 (40.16)	371 (59.84)	620 (100)	

Table 3: Association between age, sex and occupation of study participant with cataract

Cataract				
Sex	**Present N (%)**	**Absent N (%)**	**Total N (%)**	
Male	112 (44.27)	141 (55.73)	253 (100)	$\varkappa^2$ = 3.00, df = 1, p = 0.08
Female	137 (37.33)	230 (62.67)	367 (100)	
Total	249 (40.16)	371 (59.84)	620 (100)	
Age (In Years)	Present N (%)	Absent N (%)	Total N (%)	
60 – 65	153 (38.54)	244 (61.46)	397 (100)	
66 – 70	53 (40.46)	78 (59.54)	131 (100)	
71 – 75	28 (48.28)	30 (51.72)	58 (100)	$\varkappa^2$ = 2.40, df = 4, p = 0.66
76 – 80	04 (50.00)	04 (50.00)	08 (100)	
>80	11 (42.31)	15 (57.69)	26 (100)	
Total	249 (40.16)	371 (59.84)	620 (100)	
Occupation	Present N (%)	Absent N (%)	Total N (%)	
Retired	30 (40.54)	44 (59.46)	74 (100)	
Farmer	85 (39.35)	131 (60.65)	216 (100)	$\varkappa^2$ = 0.47, df = 3, p = 0.93
Industry Worker	34 (43.59)	44 (56.41)	78 (100)	
Housewife	100 (39.68)	152 (60.32)	252 (100)	
Total	249 (40.16)	371(59.84)	620 (100)	

Discussion

A total of 620 participants were examined in the study. The prevalence of cataract in our study was 40.16%. Out of 376 study participant, who had morbidity, 43.62% were male and 56.38% were female. A cross sectional study conducted in Loni, noted 57% mature cataract cases and others were immature and hypermature. More than half (52.25%) of the total cataract cases were bilateral [10]. A study conducted in Tirunelveli district revealed that 58.1% cases were bilateral cataract and 12.5% had cataract only in one eye [11]. A study conducted in Wardha, stated 46.5% prevalence rate of cataract in female compared to 26.5% in male [12]. The findings in the present study were similar to the above mentioned studies with more than half cases being bilateral, mature cataract and among female subject.

The study results reveal that the prevalence rate of cataract gradually increases from 60 years of age to 80 years. Inspite of this gradual increase, age of participant was not significantly associated with prevalence rate of cataract. As the age increased protein in the lens of eye starts fusing to form cataract, which might be the cause for higher prevalence of cataract. Due to this reason older individuals

may go in for surgeries and prevalence of cataract might be lower among them.

In a cross sectional study conducted in Loni, majority of patients (55%) suffering from cataract were in the age group of 60 – 80 years, and showed a significant association with age ($p<0.001$) [10]. As this study was carried out in general population, statistical significance may be seen. In a study conducted in Tirunelveli district, age was significantly associated with cataract ($p<0.01$) [11]. A study conducted in Villupuram district, Tamil Nadu, age was significantly associated with prevalence rate of cataract ($p<0.001$) [13]. Though there was increase in number of cataract cases as age increased, statistical significance was not seen in our study.

In a study conducted in Wardha district, the prevalence of cataract among elderly male was slightly higher than female but not statistically significant ($p>0.05$) [14]. A similar study conducted in Bundelkhand, revealed prevalence of cataract was not significantly associated with sex (p = 0.43) [15]. The results of our study were very similar to these studies.

Among study participant belonging to Muslim and Jain religion, almost two third had cataract. Among Hindus, slightly more than one third had cataract. It was noteworthy that Hindus had less prevalence of cataract compared to Muslim and Jain participants and it was statistically significant ($\varkappa^2 = 12.06$, p = 0.002). A cross sectional study carried out in Bundelkhand, reported statistical significant difference between literacy status of study population and prevalence rate of cataract (p = 0.001) [15]. A study conducted in Loni, revealed that prevalence rate of cataract to be statistically significantly associated with literacy status of study population ($p<0.05$) [10]. The cross sectional study conducted in Tiruvelneli district, also showed statistical significant difference between prevalence rate of cataract and literacy status of study population ($p<0.05$) [11]. The findings in our study match the findings observed in all of these studies.

In the present study, among 176 participant who had indoor air pollution at their home, almost half (48.29%) had cataract. Indoor air pollution played a significant role in increasing the prevalence of cataract among study participant in our study ($\varkappa^2 = 6.77$, p = 0.009). Various studies conducted in Bundelkhand, Wardha reported statistical association between fuel used for cooking and prevalence of cataract [14, 15]. The findings in these studies were similar to our study. Indoor air pollution is risk factor for cataract formation as eyes get more exposed to fumes as they have to blow into fire from time to time, causing irritation and dryness. It is believed that the toxins from biomass fuel smoke are absorbed systematically and get accumulated in lens resulting in opacity. They also lead to various other ocular morbidities. This can be decreased by promotion of usage of LPG stoves or building smoke vent at homes of the individual using biomass, wood or kerosene for cooking.

Conclusion

The present cross sectional study, noted a prevalence rate of cataract among elderly population in rural area to be 40.16%. Prevalence of cataract varied with age, religion, literacy status of study participant and history of indoor air pollution. Based on the findings of our study, the recommendations which can be implemented include, need for more comprehensive interventions targeting the identification of risk factors, development of screening procedures using simple diagnostic criteria which can be utilized for training the field workers, mobile health clinics equipped with all basic modern technologies can be the solution for curing the cases who are reluctant to seek care for their illness.

References

1. Thylefors B. Avoidable blindness. Bull World Health Organ. 1999; 77:453.
2. Ministry of statistics and programme implementation. Elderly in India. Government of India, 2016. Accessed on: 2nd June 2019. Available from: http://mospi.nic.in/sites/default/files/publication_reports/ElderlyinIndia_2016.pdf
3. Balasubramaninan D, Bansal AK, Basti S, Bhatt KS, Murthy JS, Rao CM. The biology of cataract. The Hyderabad cataract research group. Indian J Ophthalmol. 1993; 41(4):153-171.
4. Rajan Irudaya S. Population ageing and health in India. Mumbai: Centre for Enquiry into Health and Allied Themes, 2006. Accessed on: 2nd June 2019. Available at: www.cehat.org.
5. Kishore J. J Kishore's National Health Programs of India. 12th edition: Centuary publications, 2017, 490-91.
6. Agrawal D, Singh JV, Sharma MK, Mitthal S. Ocular morbidity pattern of an urban population of Meerut. Ind J Prev Soc Med. 2011; 42(1):75-78.
7. Verma V, Prakash S, Parveen K, Shaikh S, Mishra N. A comparative study of morbidity pattern in elderly of rural and urban areas of Allahabad district, Uttar Pradesh, India. Int J Community Med Public Health. 2016; 3:1152-6.
8. Indoor air pollution in India – a major environmental and public health concern. ICMR Bulletin. 2000; 31(5):61-68.
9. Ministry of Health and Family Welfare, Government of India. State wise targets & Achievement for various eye diseases during 2017-18. National Programme for Control of Blindness; 2018. Accessed on: 2nd, 2019. Available at: http://npcb.nic.in/writereaddata/mainlinkfile/File343.pdf
10. Avachat SS, Phalke V, Kambale S. Epidemiological correlates of cataract cases in tertiary health care center in rural area of Maharashtra. J Fam Med Primary Care 2014; 3:45-7.
11. Nirmalan K, Thulasiraj RD, Maneksha V, Rahmathullah R, Ramakrishnan R, Padmavathi A *et al*. A population based eye survey of older adults in Tirunelveli district of south India: blindness, cataract surgery, and visual outcomes. Br J Ophthalmol. 2002; 86:505-512.
12. Pisudde PM, Taywade ML, Sushma K, Mehendale AM, Shukla AK. An Epidemiological Study of Common Ocular Morbidities among Elderly Population in the Wardha, District, Maharashtra, India. Epidemiology. 2015; 5:002.
13. Aarthi R, Roy G, Kar SS, Srinivasan R. Prevalence of cataract among adults above 50 years in a rural community of Villupuram, Tamil Nadu. Int J Adv Med Health Res. 2015; 2:50-4.
14. Singh MM, Murthy GV, Venkatraman R, Rao SP, Nayar S. A study of ocular morbidity among elderly

population in a rural area of central India. Indian J Ophthalmol. 1997; 45:61-65.
15. Jitendrakumar, Sirohi N, Tiwari N. Ocular Morbidity Among Elderly Population in Rural Areas of Bundelkhand. IOSR Journal of Dental and Medical Sciences. 2016; 15(6)(VIII):5-10.
16. Ministry of Health and Family Welfare, Government of India. National Programme for Control of Blindness. Accessed on: 15th, 2017. Available at: http://npcb.nic.in/
17. Singh A, Dwivedi S, Dabral SB, Bihari V, Rastogi AK, Kumar D. Ocular morbidity in the rural areas of Allahabad, India. Nepal J Ophthalmol. 2012; 4(7):49-53.
18. Kumar A, Srivastava AK, Mishra M, Srivastava VK. Prevalence of ocular morbidity in rural population of eastern Uttar Pradesh, India. Indian J Comm Health. 2016; 28(3):275-279.
19. Mehrotra SK, Maheshwari BB. Prevalence of ocular lesions in a rural community. Indian J Ophthalmol. 1975; 23:17-20.
20. Jitendrakumar, Sirohi N, Tiwari N. Ocular Morbidity Among Elderly Population in Rural Areas of Bundelkhand. IOSR Journal of Dental and Medical Sciences. 2016; 15(6)(VIII):5-10.