**Scholars Journal of Applied Medical Sciences (SJAMS)** **ISSN 2320-6691 (Online)**
**Sch. J. App. Med. Sci., 2014; 2(4C):1361-1366** **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com **DOI:** 10.36347/sjams.2014.v02i04.043

**Research Article**

# Prevalence of Cataract and Cataract Blindness in Wardha District

**Bhavishya Gurudasani*[1], Ajay Kumar Shukla[2], Snehal Burkule[3],Pravin Shekokar[4], Mohan Raut[5]**
[1, 3]Assistant Professor, Department of Ophthalmology, Government Medical College, Akola (M.S.), Pin-444001, India
[2]Professor& Head, Department of Ophthalmology, Mahatma Gandhi Institute of Medical Sciences, Sewagram, Dist. Wardha(M.S.), India
[4]Assistant Professor, Department of Physiology, Government Medical College, Akola (M.S.), Pin-444001, India
[5]Assistant Professor, Department of Community Medicine, Government Medical College,Akola (M.S.), Pin-444001, India

***Corresponding author**
Dr. Bhavishya Gurudasani
**Email:** bhaveshgurudasani@yahoo.in

**Abstract:** Cataract is a major cause of blindness and severe visual impairment in India. For controlling cataract blindness and effective implementation of program there is need of data on blindness and cataract blindness in each district. Hence in this study prevalence of cataract and cataract related blindness and the coverage of cataract surgery was studied in Wardha district. All the 5263 persons of above 50 years of age were screened and examined at their door steps with Snellen's chart with available correction. Out of these only 1104 persons (those who had undergone cataract surgery and having visual acuity <6/60) were taken up for interview and complete ocular examination. In this study it was found that social blindness was significantly more common in females. Prevalence of economic blindness was found to increase with increase in the age of persons examined. Based on visual acuity <6/60 in persons more than 50 years of age prevalence of cataract was found to be 7.39%. Prevalence of cataract blindness was found to be significantly more in females and the cataract surgical coverage was 59% for persons.
**Keywords:** Blindness, Cataract, National blindness control program

## INTRODUCTION

Cataract is major cause of blindness and severe visual impairment in developing countries like India. As per the surveys done recently in India on blindness, the role of cataract as a major cause of blindness has increased [1]. India is country of diversity, the different states having different demographic and socioeconomic status. Availability and accessibility of health services also varies in different areas which in turn affects distribution of blindness and cataract blindness. In recent years new strategies that decentralize the implementation of blindness control program to district level have been adapted. For controlling cataract blindness and effective implementation of program there is need of data on blindness and cataract blindness in each district. Population based surveys have to be conducted for this purpose to know the exact pictures which will help in planning and monitoring of cataract of cataract control program.

To know the impact of cataract control program on the population and the actions needed to improve the quality of services; various factors can be studied like prevalence of cataract blindness, cataract surgical coverage, cataract surgery outcome. The present study was undertaken to see the prevalence of cataract and cataract blindness in one of the district of Maharashtra (Wardha).

### Aims and Objectives

This study was done with the following objectives.

- To study the prevalence of cataract and cataract blindness in the population of Wardha district
- To study the coverage of cataract surgery

## MATERIALS AND METHODS

This study was conducted by the department of Ophthalmology, Mahatma Gandhi Institute of Medical Sciences, Sewagram, Dist. Wardha during the year 2003. The study was undertaken after taking the permission from institutions ethical committee. All the subjects were explained about the importance of this study and the non-invasive nature of this study. All the subjects were agreed to participate in the study. The national survey on blindness in India indicated that of all age related cataract blindness, 95% occur in the age group of 50 years and above. Therefore this study was

focused on assessment of population above 50 years of age.

**Estimation of sample size for the study**

The sample size for the study can be calculated from current data on prevalence of Senile Cataract Blindness that is 1.49%. Taking normal average of 1.2% (80% of 1.49%) and using the formula

n= (1.96%) pq / L2

where,

p = 1.2 % prevalence

q = 1-p

L = allowable error (i.e. 10 %)

Thus the sample size becomes 31,629.Total number of villages in three blocks i.e. Seloo, Samudrapur and Hinganghat were 581. Cumulative population of these blocks was 3,69,856.Minimum 30 clusters covering approximately thirty thousand populations were screened for Cataract blindness. Cluster interval was calculated to 12329 and clusters identified among above 581 villages. Each cluster had population 850 and 1700 population. Only persons aged more than 50 years of age were included in this study. Mapping and numbering of each threshold in which persons > 50 years resides was done along with enumeration of the same. Households in which no individual > 50 years resides were excluded. In the village clusters included in the study, total population above 50 years of age was 5363 comprising 12.8 % of the total population. Out of these 5263 (98.1 %) persons could be screened at their door steps, remaining 1.9 % were not available in home for examination. Out of 5263, persons aged more than 50 years 2458 (46.7%) were males and 2805 (53.3%) were females.

On the day of visit, door-to-door examination of every individual above 50 years was done. The examination included vision testing on Snellen's chart with available correction and pinhole test. All the cataract blind patients and persons operated for cataract were interviewed in detail. Data was entered on self-coded forms. A pretested standardized proforma was used to record the observation.

**RESULTS**

The study was conducted in 30 randomly selected village clusters. In the village clusters total population above 50 years of age was 5363. Out of these only 5263 persons could be screened. In persons aged more than 50 years, 2458 (46.7%) were males and 2805 (53.3%) were females. In the 5263 persons included in the study, visual acuity was tested in both eyes separately with Snellen's chart with suitable correction. In the study group history of cataract surgery in either eye was specifically asked.

The observations made in this study are as follows.

**Table 1: Age distribution of study population**

| Age group | Enumerated no. (%) | Screened No. (%) | Coverage (%) |
|---|---|---|---|
| 50-54 | 1200 (22.4) | 1178 (22.4) | 98.2 |
| 55-59 | 1170 (21.8) | 1142 (21.7) | 97.6 |
| 60-64 | 1145 (21.4) | 1126 (21.4) | 98.4 |
| 65-69 | 1101 (20.5) | 1083 (20.6) | 98.4 |
| 70+ | 747 (13.9) | 734 (13.9) | 98.4 |
| Total | 5363 | 5263 | 98.1 |

**Table 2: Sex distribution of study population**

| Sex | Enumerated no. (%) | Screened No. (%) | Coverage (%) |
|---|---|---|---|
| Male | 2525 (47.1) | 2458 (46.7) | 97.3 |
| Female | 2838 (52.9) | 2805 (53.3) | 98.8 |
| Total | 5363 | 5263 | 98.1 |

**Table 3: Sex wise distribution of blindness in study population**

| | Male n=2458 | Female n= 2805 | Total n=5263 |
|---|---|---|---|
| Economic blind (VA < 6/60 in better eye) | 80 (3.25) | 106 (3.77) | 186 (3.53) |
| Social blind (VA < 3/60 in better eye) | 67 (2.72) | 134 (4.77) | 201 (3.81) |
| One eye blind (VA <6/60 in worst eye) | 68 (2.76) | 58 (2.06) | 126 (2.39) |

(VA = visual acuity)

As per Indian criteria 186 (3.53%) were economic blind, 201 (3.81%) were social blind and 126 (2.39%) had unilateral blindness. Sex distribution of blindness in study group shows that social blindness was more common in females.

**Table 4: Age specific prevalence of blindness in study population**

| Age group | Total population | Economic blind no. (%) | Social blind no. (%) |
|---|---|---|---|
| 50-54 | 1178 | 0 (0%) | 0 (0.0) |
| 55-59 | 1142 | 3 (0.26) | 1 (0.08) |
| 60-64 | 1126 | 48 (4.2) | 22 (1.95) |
| 65-69 | 1083 | 63 (5.81) | 53 (4.89) |
| 70+ | 734 | 72 (9.8) | 125 (17.02) |
| Total | 5263 | 186 (3.53) | 201 (3.81) |

Prevalence of economic and social blindness was found to increase with increase in age of the persons examined. Prevalence of economic blindness increased from 0.26% in 55-59 age group to 9.8 % % in persons aged more than 70 years. Whereas prevalence of social blindness increased from 0.08% in the 55-59 age group to 17.02% in persons aged more than 70 years.

**Table No. 5: History of cataract surgery**

| History of cataract surgery | No. of cases | Percentage |
|---|---|---|
| In one eye | 379 | 7.2 |
| In both eyes | 269 | 5.1 |
| Total | 648 | 12.3 |

Out of 5263 persons, 379 (7.2%) had undergone cataract surgery in one eye and 269 (5.1%) had undergone cataract surgery in both eyes.

Out of total population aged more than 50 years screened, a total of 917 eyes had been operated for cataract out of which 226 eyes had presenting visual acuity less than 6/60.

Out of 5263 persons aged more than 50 years screened at their door step that had not undergone any ocular surgery, 722 eyes of 456 persons were found to have visual acuity less than 6/60. In addition out of 379 persons who had undergone cataract surgery in one eye, 260 persons had visual acuity less than 6/60 in un-operated eye. In all 982 un-operated eyes of 825 persons had visual acuity less than 6/60.

Out of 5263, only 1104 were taken for detailed ocular examination, history and interview. 1104 persons included 648 persons who had been operated for cataract surgery in one or both eyes and 456 persons having presenting visual acuity < 6/60 in either eye with no history of ocular surgery Out of 1104 persons examined, 479 (43.4%) were males and 625 (56.6%) were females.

**Table 6: Visual status of study population (as per Indian criteria)**

| Visual status | Operated (n=648) No. (%) | Un-operated (n=456) No. (%) | Total (n=1104) No. (%) |
|---|---|---|---|
| Normal vision (≥ 6/18 in both eyes) | 88 (13.6) | * | 88 (8.0) |
| Low vision (<6/18- ≥ 6/60 in better eye | 363 (56.0) | 140 (30.7) | 503 (45.6) |
| Economic blindness (< 6/60 in better eye) | 61 (32.8) (9.4) | 125 (67.2) (27.4) | 186 (100.0) (18.2) |
| Social blindness (<3/60 in better eye) | 56 (27.9) (8.6) | 145 (72.1) (31.8) | 201 (100.0) (18.2) |
| Unilateral blindness (<6/60 in worst eye) | 80 (63.5) (12.3) | 46 (36.5) (10.1) | 126 (100.0) (11.4) |

*Only persons with visual acuity 6/60 in one or both eye included in the study.

Out of 648 persons who had been operated for cataract in one or both eye 61 (9.4%) were economic blind, 58 (8.6%) were social blind and 80 (12.3%) were one eye blind. Out of 456 persons with presenting visual acuity , 6/60 in either eye who had not undergone any ocular surgery 125 (27.4%) were economic blind,

145 (31.8%) were social blind and 146 (10.1%) were one eye blind. Out of 186 persons suffering from economic blindness 125 (67.2%) and out of 201 persons suffering from social blindness, 145 (72.1%) had not undergone for any ocular surgery.

**Table 7: Visual status of study population (as per WHO criteria) [10]**

| Visual status | Operated (n=648) No. (%) | Un-operated (n=456) No. (%) | Total (n=1104) No. (%) |
|---|---|---|---|
| Normal vision | 446 (68.8) | 113 (24.8) | 559 (50.6) |
| Visual impairment | 125 (44.2) (19.3) | 158 (55.8) (34.6) | 283 (100.0) (25.6) |
| Severe visual impairment | 33 (42.3) (6.5) | 45 (57.7) (9.9) | 78 (100.0) (7.1) |
| Both eye blind | 42 (25.0) (6.5) | 126 (75.0) (27.6) | 168 (100.0) (15.2) |
| Absolute blind | 2 (12.5) (0.3) | 14 (87.5) (3.1) | 16 (100.0) (1.5) |

As per WHO criteria, out of 648 persons who had been operated for cataract in one or both eye 33 had severe visual impairment, 42 had blindness in both eye and 2 were absolute blind.

Out of 456 persons with presenting visual acuity < 6/60 in either eye that had not undergone any ocular surgery 45 had severe visual impairment, 126 had blindness in both eyes. And 14 were absolute blind.

**Table 8: Prevalence of cataract blindness in persons > 50 years**

| Visual Acuity | Unilateral cataract blindness No. (%) | Bilateral cataract blindness No. (%) | Total (Unilateral + Bilateral cataract blindness) No. (%) |
|---|---|---|---|
| < 3/60 | 279 (5.30) | 110 (2.09) | 389 (7.39) |
| < 6/60 | 302 (5.73) | 144 (2.74) | 446 (8.47) |

An individual was recorded as blind due to cataract in a particular eye when visual acuity was less than 6/60 (<3/60) in that eye and obvious lens opacity was present as main cause of blindness. As per Indian criteria (VA < 3/60) amongst 5263 persons aged more than 50 years, prevalence of cataract blindness was found to be 7.39 % (389 cases.

As per WHO criteria (VA <6/60) in the study population the prevalence of cataract blindness was found to be 8.47% (446 cases).

**Table 9: Sex wise prevalence of cataract blindness**

| Visual Acuity | Male No. (%) (n = 2458) | Females No. (%) (n = 2805) | Total No. (%) (n = 5263) |
|---|---|---|---|
| < 3/60 | 152 (6.15) | 237 (8.44) | 389 (7.39) |
| < 6/60 | 176 (7.13) | 270 (9.62) | 446 (8.47) |

Prevalence of cataract blindness was found to be more common in females as compared to males. Prevalence of cataract blindness was found to increase with increase in the age of the persons examined.

**Table 10: Age specific prevalence of cataract blindness**

| Age group (in years) | Total Population | Cataract Blind (VA < 3/60) No. (%) | Cataract Blind (VA < 6/60) No. (%) |
|---|---|---|---|
| 50-54 | 1178 | 03 (0.25) | 04 (0.33) |
| 55-59 | 1142 | 06 (0.52) | 09 (0.79) |
| 60-64 | 1126 | 77 (6.84) | 93 (8.26) |
| 65-69 | 1083 | 142 (13.11) | 160 (14.77) |
| 70+ | 734 | 161 (21.43) | 180 (24.52) |
| Total | 5263 | 389 (7.39) | 446 (8.47) |

**Table 11: Cataract surgical coverage (For persons)**

| No. of persons with unoperated cataract | No. of persons operated for cataract | No. of persons operated &unoperated | Surgical coverage (%) |
|---|---|---|---|
| 389 (VA< 3/60) | 648 | 1037 | 62.48 |
| 446 (VA < 6/60) | 648 | 1094 | 59.00 |

**Table 12: Cataract surgical coverage (For Eyes)**

| No. of persons with unoperated cataract | No. of persons operated for cataract | No. of persons operated &unoperated | Surgical coverage (%) |
|---|---|---|---|
| 499 (VA< 3/60) | 917 | 1416 | 6.75 |
| 590 (VA < 6/60) | 917 | 1507 | 60.84 |

In the study population 648 persons (917 eyes) were noted to have undergone cataract surgery in one or both eyes. 389 persons (499 eyes) were noted to have blindness (VA < 3/60) due to cataract whereas 446 persons (590 eyes) were noted to have blindness (VA <6/60) due to cataract.

As per Indian criteria (VA <3/60) cataract surgical coverage was found to be 62.48 % for persons and 65 % for eyes whereas as per WHO criteria (VA < 6/60) cataract surgical coverage was 59 % for persons and 60% for eyes.

**DISCUSSION**

In the present study out of 5263, more than 50 years population screened prevalence of economic blindness (<6/60 in better eye) was noted to be 3.53%, social blindness (<3/60 in better eye) to be 3.31% and one eye blindness (< 6/60 in worst eye) was 2.39%.

Limburg *et al*. [2]age-gender-adjusted prevalence of all blindness was 2.9% in persons ≥50 years of age (6.7% for visual acuity<6/60). Dondona*et al*. [3] studied prevalence of blindness in above 30 years population, the rate of blindness (PVA < 6/60) was 3.08%. Pokharel*et al*. [4] found prevalence of blindness in above 45 years population as 5.3%, which is comparable to our study.

In the present study, sex wise prevalence of economic blindness was 3.25 % in males and 3.77% in females, of social blindness was 2.72% in males and 4.75% in females and unilateral blindness was 2.76% in males and 2.06% in females. Social blindness was significantly more common in females (p<0.001).

In previous studies, Limburg *et al*. [5]reported prevalence of social blindness (<3/60 in better eye) to be 6.8% in persons above 40 years. Sex wise prevalence was 8.3% in females and 5.1% in males.

In the present study amongst 5263 persons aged above 50 years who were screened for presenting visual acuity (VA <3/60), prevalence of cataract blindness was found to be 7.39% (389 cases).Out of this unilateral cataract blindness was noted in 5.3% (279 cases) and bilateral blindness was noted in 2.09% (110 cases). Prevalence was also calculated for VA <6/60 and it was 8.47% (446).

The prevalence of cataract blindness (VA <3/60) was 0.93%. Out of these 0.67% had unilateral blindness while 0.26% had bilateral cataract blindness. Prevalence of cataract blindness (VA < 6/60) was 1.07% in whole population out of which 0.72% had unilateral cataract blindness and 0.35% had bilateral cataract blindness.

Tizau et al*et al*. [6] had reported prevalence of cataract blindness ranging from 1.9% to 2.5% I different parts of southern India. Venkatswamy*et al*. [7] reported prevalence of bilateral cataract blindness in > 40 years and eye (VA <3/60) to be 3.7%.

Limburg *et al*. [2]studied prevalence of cataract blindness in > 50 years of age and reportedage-gender-adjusted prevalence of bilateral cataract blindness for visual acuity <3/60 was 1.2% in persons ≥50 years of age and or visual acuity <6/60, the prevalence was 3.1%.

In the present study prevalence of cataract blindness was found to be more common in females than males. In persons aged more than 50 years, cataract blindness (VA <3/60) was noted in 8.44% of females as compared to 6.15% of males (p<0.001). For visual acuity <6/60 prevalence was 9.62% in females as compared to 7.13% in males (p<0.005). Prevalence of cataract blindness was found to increase with increase in the age of the persons examined (p<0.0001).

Tian Sheng *et al*. [8] reported that prevalence of cataract blindness increases with age. Limburg *et*

*al*.[5]reported prevalence of bilateral cataract blindness (VA<3/60) to be higher in females (>40 years) 7.6% than males (>40 years) 4.8%.

In the present study 648 n(917 eyes) persons were noted to have undergone cataract surgery in one or both eyes. 389 persons (499 eyes) were note to have blindness (VA<3/60) due to cataract, whereas 446 persons (590 eyes) were having blindness (VA <6/60) due to cataract. For visual acuity <3/60 cataract surgical coverage was found to be 62.48% for persons and 65% for eyes, whereas for VA <6/60 cataract surgical overage was 59% for persons and 60% for eyes.

Limburg *et al*. [9] reported cataract surgical coverage for eyes (<3/60) to be 22.5% in Purnea District, Bihar. Limburg *et al*. [5] reported the cataract blind persons in Mohadi block, 31% of the females and 38% of the males had been operated upon and two thirds of all cataract blind patients had not been covered till then and were in need of surgical services.

## CONCLUSION

Based on visual acuity out of 5263 persons screened, 186 (3.53%) were economic blind, 201 (3.81%) were social blind and 126 (2.39%) had unilateral blindness as per Indian criteria. Sex distribution of blindness in study population shows that social blindness was significantly more common in females ($p<0.001$).

Prevalence of economic blindness and social blindness was found to increase with increase in the age of the persons examined.

Based on visual acuity <3/60 in persons aged > 50 years, cataract blindness in one or both eyes was noted in 7.39 persons (5.3% unilateral cataract blindness and 2.09% had bilateral cataract blindness).

Based on visual acuity <6/60, cataract blindness was noted in 8.47% persons (5.73%unilateral cataract blindness and 2.74% had bilateral cataract blindness).

In the study population, prevalence of cataract blindnesswas found to be significantly more common in females as compared to males.

Prevalence of cataract blindness was found to increase with increase in the age of the persons examined.

Based on the visual acuity <3/60 cataract surgical coverage was found to be 62.48% for persons and 65% for eyes.

Based on visual acuity <6/60 cataract surgical overage was 59% for persons and 60% for eyes.

## ACKNOWLEDGEMENT

Authors acknowledge the staff members who helped in the collection of sample and the study group. We are also grateful to the study population on whom this study was done. This study was done to present dissertation for D.N.B. Ophthalmology examination. No outside funding was received for this study.

## REFERENCES

1. The national Program for control of blindness; Ministry of Health and family welfare, Government of India, 1976.
2. Limburg H, Vasavada AR, Muzumdar G, Khan MY, VaidyanathanK, TrivediR et al.; Rapid assessment of cataract blindness in an urban district of Gujarat. Community Eye Care, 1999; 47(2): 135-141.
3. Dandona L, Dandona R, Naduvilath TJ, McCarty CA, Nanda A, Srinivas M, et al: Is current eye-care policy focus almost exclusively on cataract adequate to deal with blindness in India? Lancet 1998;351(9112):1312-1316.
4. Pokharel GP, Regmi G, Shrestha SK, Negrel AD, Ellwein LB; Prevalence of blindness and cataract surgery in Nepal. Br J Ophthalmol., 1998; 82(6):600-605.
5. Limburg H, Vaidyanathan K, Pampattiwar KN; Cataract blindness on the rise? Results of a door-to-door examination in Mohadi.Community Eye Care, 1996; 44(4): 241-244.
6. Tizazu T, Mburu FM; Prevalence and causes of vision loss in southern Sudan. SocSci Med., 1983;17(22):1785-1788.
7. Venkatswamy G; Social consequences of cataract blindness. Commun Eye Health., 1990;3:6–7.
8. Hu TS, Zhen Q, Sperduto RD, Zhao JL, Milton RC, Nakajima A; Age related cataract in the Tibet eye study. Arch Ophthalmol.,1989;107(5):666-669.
9. Limburg H, Pathak YN; Experience in pilot project in Purnea district. Ind J Ophthalmol., 1996:44(2):117-121.
10. WHO; Global initiative for the elimination of avoidable blindness. WHO Fact sheet, 1999.