



## PREVALENCE AND PATTERN OF OCULAR MORBIDITY IN A RURAL POPULATION OF HEBBAL, KALABURGI DISTRICT : A COMMUNITY BASED CROSS SECTIONAL STUDY

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### ABSTRACT

Blindness and vision impairment are major public health problem causing a substantial human and economic toll on individuals and society including significant suffering, disability, and diminished quality of life for millions of people. Ocular morbidity is one of the major public health problem in India affecting not only the quality of life, but also has impact on educational and employment opportunities. The lack of community based studies on ocular morbidity, especially in rural areas is one of reason for inadequate focus on the subject. Studies showing the prevalence and pattern of ocular morbidity are needed to build better infrastructure of eye-care facilities.

**Method:** A Cross-sectional study was carried out in the rural field practice area of department of Community Medicine, Hebbal from January 2014 to June 2015. The study population included 3625 residents from rural field practice area, Hebbal. The data was collected using pre-tested proforma and was analyzed using percentages and Chi-Square test to test the statistical significance at ( $p < 0.05$ ).

**Results:** The prevalence of ocular morbidities in this study was found to be 15.09%. Refractive errors were the most common ocular morbid conditions responsible for 53.75% of total ocular morbidities. Ocular morbidities were statistically associated with increasing age, illiteracy, occupation, socio-economic status and solid fuel used for cooking.

**Conclusion:** In most of the study subjects ocular morbidities were either preventable or treatable. But due to ignorance and carelessness of being not attended to, they cause impairment of vision or even blindness.

**KEYWORDS :** Ocular morbidity, Visual impairment, Blindness, rural population.

### 1. Introduction

Ocular morbidity is defined as the spectrum of eye diseases which includes both visually impairing and non-visual impairing conditions, experienced by a population. Ocular morbidity is either significant to the individual (the individual is concerned enough about the condition to seek care) or to professionals (an eye health professional determines that the individual would benefit from advice, further review or treatment)<sup>1</sup>. Visual impairment and blindness due to ocular diseases is a significant public health problem in many parts of the world<sup>2</sup>.

On World Sight Day 2017 according to WHO around 253 million people live with vision impairment worldwide, of which 36 million are blind. The vast majority live in low-income settings. More than 80% are aged 50 years or above. Globally, uncorrected refractive errors and un-operated cataract are the top two causes of vision impairment. More than 80% of all visual impairment can be prevented or cured. Measures to do so should focus on increasing access to quality comprehensive eye care services, including at the community level<sup>3</sup>.

As per National Program for Control of Blindness (NPCB) the prevalence of avoidable blindness in India was 1.1% in 2001 -2002, which has reduced to 1% in 2006-07. The country has still a long way to go to achieve the target prevalence of 0.3% envisaged by the program by the year 2020. In terms of absolute numbers, India has about 12 million blind people, the majority of them living in rural areas, with poor access to quality eye care services. By the year 2020, this number is projected to be twice the current level, without appropriate strategies<sup>4</sup>.

Over the past few decades, the health standard of people living in rural areas has improved gradually, but visual health has been lagging and neglected. Undiagnosed ocular morbidity reduces quality of life and economic productivity significantly. Although Vision 2020 program has reduced avoidable blindness nationally, its impact on rural areas is lacking. Very few studies have been done to evaluate ocular morbidity in rural population<sup>5</sup>.

Studies showing the pattern of ocular morbidity are needed to build better infrastructure of eye care facilities, which meets all the requirements of particular population. There are limited studies about the prevalence of ocular morbidity or resulting effects over the quality of life, most of them are confined to high income countries<sup>6</sup>.

The present study attempts to determine the prevalence and pattern of common ocular morbidity and the various factors associated with

ocular morbidity in a rural community in South India.

### 2. Materials and Methods

The study was a community based cross sectional study, conducted in rural field practice area, Hebbal village under the department of Community Medicine, M. R. Medical College, Kalaburagi. The study was carried out on all the permanent residents from January 2014 to June 2015. The population of rural field practice area, Hebbal is 3625 comprising 2 out of 4 sub-centres. A Pilot Study on 25 subjects was conducted. Relevant changes were made in the initial questionnaire, a final proforma was designed and the study continued by house to house visit was made in the study area, the nature, purpose and objectives of the study were explained to the respondents for the study. The data was collected by interviewing the respondents using a pre-designed and pre tested proforma during house to house visit. In absence of the respondent during first visit repeat visits were made to contact them personally. The general information of the households and its members, and presence or absence of ocular morbidity was recorded. For diagnosing ocular morbidity, visual acuity was assessed by using Snellens chart, near vision was checked by Jaegers chart, colour blindness was checked by using Ishihara chart, axis deviation was assessed by using cover / uncover test. Past history of ocular morbidity was taken from their records. Other ocular morbidities were detected by ocular examination with naked eye examination and torch examination of the eye. Individuals diagnosed with having any ocular morbidity were further dealt with detailed ophthalmic examination and diagnosis of various other ocular morbidities was done by using Ophthalmoscope, those subjects requiring advanced care were referred to higher centres. Ethical clearance was obtained from the ethical committee of M.R Medical College, Kalaburagi. The statistical tests used are percentages and chi-square test. The statistical software SPSS 12 version is used for the analysis of the data.

### 3. Results and Discussion

Out of 3625 participants examined from all age groups, majority of study subjects 1564 (43.14%) were in age group  $\leq 20$  years followed by 1143 (31.53%) in age group 21-40 years, 680 (18.76%) in the age group 41-60 and least 238 (6.57%) were in the age of above 60 years. Of the 3625 study subjects examined, nearly equal proportions of males and females were examined, 1796 (49.54%) of study subjects were male and 1829 (50.46%) were female. Majority of study subjects 3397 (93.71%) were Hindu by religion and 42 (6.67%) were Muslims. As per the educational status is concerned maximum study subjects 1428 (43.34%) were illiterates, followed by 347 (10.53%) had primary education, 397 (12.05%) had middle education, 571 (17.33%)

had secondary education, 387 (11.75%) were intermediate or diploma, 112 (3.40%) were graduates and least 53 (1.53%) were post graduates. Majority of study subjects 1120 (40.93%) were farmers / labourers by occupation, 721 (26.35%) were housewives, 411 (15.02) were students, 198 (7.24%) were unemployed, 184 (6.73%) were self employed, and 102 (3.73%) were serviced. Majority of study subjects 2086 (57.54%) belonged to class IV SES, followed by 857 (23.64%) in class V, 465 (12.83%) in class III, 198 (5.46%) in class II and least 19 (0.53%) in class I respectively. The prevalence of ocular morbidities in this study was found to be 15.09%. (Table-2)

The table-3 shows the pattern of various ocular morbid conditions in the study population. Some patients suffered more than one ocular morbidity. For that reason, the total number of morbidity is more than the total number of patients. Refractive errors were the most common ocular morbid conditions in study subjects accounting for 53.75% (294) of total ocular morbidities. Immature cataract was second most common ocular morbidity i.e. 23.30% (122) followed by Pseudophakia 16.64% (91), Pterygium 11.70% (64), Mature cataract 10.42% (57), Presbyopia 5.85% (32), Conjunctivitis 2.19% (12), Corneal opacity 1.83% (10), Blepharitis 1.46% (8), Conjunctival xerosis 0.73% (4). Prevalence of Dacrocystitis, Diabetic retinopathy, Xerophthalmia, Pinguecula, and Strabismus was 0.55% (3) each. Prevalence of Colour blindness, Hypertensive retinopathy, Blindness was 0.37% (2) each and Ptosis and Styne was 0.18% (1) each.

The prevalence of ocular morbidity was higher 68.49% among those aged above 60 years of age and least 1.78% among those aged  $\leq$  20 years. There is highly significant association between ocular morbidity and age of study subjects ( $P < 0.001$ ). Prevalence of ocular morbidity increased significantly with advancing age.

There is no statistically significant difference of ocular morbidity among males and females ( $p > 0.05$ ) as the prevalence of ocular morbidity was slightly higher in females (15.86%) as compared to males (14.31%).

The prevalence of ocular morbidity was higher in the illiterates group (21.96%) and minimum (4.58%) in the group with primary education. It was seen that as the level of education increases, the prevalence of ocular morbidity decreases. There is highly significant association between ocular morbidity and literacy status of study population ( $P < 0.001$ ).

The prevalence of ocular morbidity was higher in individuals who belonged to farmers and labourers group (25.27%) and least (1.16%) in the student group signifying highly significant association between ocular morbidity and occupation of study population ( $P < 0.001$ ). The prevalence of ocular morbidity was higher (27.78%) in the socio economic class II and least (11.44%) in class V SES showing a highly significant association between ocular morbidity and socio-economic status of study population ( $P < 0.001$ ).

In the present study, the prevalence, pattern and socio-demographic factors association with ocular morbidity were more or less similar to other studies. The prevalence of ocular morbidity in this study was 15.09%. According to a study done by Khaki Kimani et al7 the prevalence of ocular morbidity was 15.52% which is similar to our study. Vaishali K Shrote et al8 reported ocular morbid conditions in the rural population as 32.11%.

The present study revealed that refractive errors were the most common ocular morbid conditions in study subjects responsible for 53.75% (294) of total ocular morbidities, followed by cataract as second most common ocular condition contributing to about 33.72% (179) of total ocular morbidities followed by Pseudophakia 16.64% (91), Pterygium 11.70% (64) and other ocular morbid conditions. Dr. Sonia Puri et al9 (2011) revealed that most common cause of ocular morbidity among all age groups were refractive errors responsible for 25.5% followed by Cataract in 19% of study subjects. A Rizyal et al10 showed that refractive error were most common ocular morbid condition responsible for 22.5% of total ocular morbidities followed by cataract 17.4%. A study done by Bastola P11 found that refractive errors were the most common ocular morbidities accounting for 15.4% of total ocular morbidities.

Singh A et al12 found that ocular morbidity in rural areas was highest (40.92 %) among those aged above 60 years of age, the difference

being statistically significant ( $P$ -value  $< 0.001$ ). Our study findings were similar other studies, the prevalence of ocular morbidity was higher 68.49% among those aged above 60 years of age and highly significant association between ocular morbidity and age of study subjects ( $P < 0.001$ ). Thus an increasing trend with age was observed.

In the case of gender the present study revealed that the prevalence of ocular morbidity was higher in females (15.86%) as compared to males (14.31%). But no statistically significant difference of ocular morbidity among males and females ( $P > 0.05$ ) were observed which is similar to a study done by Sadana Adala et al13 on ocular morbidity pattern in Chittoor, Andhra Pradesh in 2014 found that higher proportions of patients were females 55.7% than males 44.3% but no statistically significant difference of ocular morbidity among males and females ( $P = 0.23$ ).

The present study revealed that prevalence of ocular morbidity was higher in the illiterates group (21.96%) and minimum (4.58%) in the group with primary education. It was seen that as the level of education increases, prevalence of ocular morbidity decreases. There is highly significant statistical association between ocular morbidity and literacy status of study population ( $P < 0.001$ ), which is similar to a study done by Vaishali K Shrote et al8 on ocular morbid conditions in the rural areas of Central India where higher prevalence of ocular morbidity was found in 40.94% illiterates. The association between ocular morbidity and educational status was statistically significant ( $P < 0.001$ ), this observation proposed the importance of education to get the knowledge, awareness regarding common ocular morbid conditions prevalent in there area and to use certain preventive measures to reduce the burden of avoidable blindness and visual impairment. Sobti S and Sahni B reported that cataract among adults in rural areas was statistically associated with outdoor occupations like farmers/zamindars, and labourers/masons ( $P = 0.044$ )14. The present study also revealed that the prevalence of ocular morbidity was higher in individuals who belonged to farmers / labourers group (25.27%) and least (1.16%) in the student group. There is highly significant association between ocular morbidity and occupation of study population ( $P < 0.001$ ). The present study revealed that the prevalence of ocular morbidity was higher (27.78%) in the socio economic class II and least (11.44%) in class V. There is highly significant association between ocular morbidity and socio economic status of study population ( $P < 0.001$ ). Similarly a study done by Vaishali K Shrote et al125 found that ocular the prevalence of ocular morbid conditions in socio-economic class II was highest 55% and there was statistically significant association between ocular morbid conditions and socio economic status ( $P < 0.001$ ).

**Table-3.1 : Distribution of study subjects according to socio-demographic characters.**

Parameter	Number	%
<b>Age groups in years</b>		
$\leq 20$	1564	43.14
21-40	1143	31.53
41-60	680	18.76
$\geq 61$	238	6.57
<b>Gender</b>		
Male	1796	49.54
Female	1829	50.46
<b>Literacy Status</b>		
Illiterate	1428	43.34
Primary	347	10.53
Middle	397	12.05
High	571	17.33
Intermediate/Diploma	387	11.75
Graduate	112	3.40
Post graduate	53	1.61
<b>Occupation *</b>		
Farmer / Labourer	1120	40.93
Housewives	721	26.35
Unemployed	198	7.24
Self employed	184	6.73
Students	411	15.02
Serviced	102	3.73
<b>Religion</b>		
Hindu	3397	93.71
Muslim	228	6.29

Socio-economic Status (Class) (Modified B.G.Prasad classification)		
I	19	0.53
II	198	5.46
III	465	12.83
IV	2086	57.54
V	857	23.64

\*Children <14 years (851) were excluded.

**Table-3.2: Distribution of study subjects according to prevalence of Ocular Morbidities.**

Ocular morbidity	Number	%
Present	547	15.09
Absent	3078	84.91
<b>Total</b>	<b>3625</b>	<b>100</b>

**Table-3.3: Distribution of pattern of Ocular Morbid conditions among the study subjects (n=547)**

Ocular morbidity	Number	%
Refractive errors	326	53.74
Immature cataract	122	23.30
Pseudophakia	91	16.64
Pterygium	64	11.70
Mature cataract	57	10.42
Presbyopia	32	5.85
Conjunctivitis	12	2.19
Corneal opacity	10	1.83
Blepharitis	8	1.46
Conjunctival xerosis	4	0.73
Dacrocystitis	3	0.55
Diabetic retinopathy	3	0.55
Xerophthalmia	3	0.55
Pinguecula	3	0.55
Strabismus	3	0.55
Colour blind	2	0.37
Hypertensive retinopathy	2	0.37
Blindness	2	0.37
Ptosis	1	0.18
Stye	1	0.18

**Table-3.4 : Association between ocular morbidity and socio-demographic characters**

Age group in years	Study subjects		
	Number	with ocular morbidity	Prevalence percent
<20	1546	15	1.78
21-40	1143	103	20.55
41-60	680	266	81.66
>60	238	163	68.49
<b>Total</b>	<b>3625</b>	<b>547</b>	<b>15.09</b>
<b>Chi-square=1188.68 P&lt;0.001 Highly significant</b>			
<b>Sex</b>			
Males	1796	257	14.31
Females	1829	290	15.86
<b>Total</b>	<b>3625</b>	<b>547</b>	<b>15.09</b>
<b>Chi-square=1.691 P&gt;0.05 Not significant</b>			
<b>Education</b>			
Illiterate	1712	376	21.96
Primary	393	18	4.58
Middle	397	43	10.83
High	571	68	11.91
Intermediate / Diploma	387	24	6.20
Graduate	112	12	10.71
Post graduate	53	06	11.32
<b>Total</b>	<b>3625</b>	<b>547</b>	<b>15.09</b>
<b>Chi-square=133.24 P&lt;0.001 Highly significant</b>			
<b>Occupation</b>			
Farmer / Labourer	1120	283	25.27
Housewives	721	125	17.34
Unemployed	466	74	15.88
Self employed	184	30	16.30
Serviced	102	23	22.55
Students	1032	12	1.16
<b>Total</b>	<b>3625</b>	<b>547</b>	<b>15.09</b>
<b>Chi-square=254.49 P&lt;0.001 Highly significant</b>			

Socio-economic status			
I	19	03	15.79
II	198	55	27.78
III	465	86	18.49
IV	2086	305	14.62
V	857	98	11.44
<b>Chi-square=30.60 P&lt;0.001 Highly significant</b>			

**4.Conclusion**

The present study revealed that prevalence and pattern of common ocular morbidities prevalent in a rural community and the association of various socio-demographic factors with ocular morbid conditions. This community based cross sectional study shows high prevalence of refractive errors and cataracts which is a major public health problem that calls for urgent need for evaluation on the accessibility of the current eye care services and barriers to eye care utilization of the rural population. Timely eye health education programme needs to be done with local health authorities, implementing work safety measures, periodic screening of school childrens and bringing ophthalmological care to the door steps of rural community will improve their level of awareness. Information obtained from this study might be helpful in improvement of existing primary eye care facilities to reduce the prevalence of blindness and severe visual impairment in rural population.

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