



RESEARCH ARTICLE

COMPARISON OF CAUSES OF SUBNORMAL VISION BETWEEN POPULATION OF RURAL
AND URBAN AREAS OF MEERUT DISTRICT

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ABSTRACT

Introduction: Low vision or Subnormal vision is a term used to describe varying degree of vision loss that cannot be corrected by medication, surgeries or conventional glasses.

Vision loss may be due to:

- Decreased visual acuity
- Visual field defect
- Decreased contrast sensitivity
- Loss of colour perception

A low vision patient is one who has impairment of visual functions even after treatment and /or standard refractive correction and has a visual acuity of less than 6/18 (20/60) to light perception or a visual field of less than 10 degree from the point of fixation, India was the first country in the world to launch the National Programme for Control Blindness in 1976 with the goal of reducing the prevalence of blindness. Of the total estimated 45 million blind persons (best corrected visual acuity <3/60) in the world, 7 million are estimated to be in India. Due to the large population base and increased life-expectancy, the number of blind particularly due to age-related disorders like cataract is expected to increase. Thus, this study is being undertaken with an aim to know the prevalence of various causes of subnormal vision to rural and urban population and manage them at a proper time.

Materials and Methods: This study was carried out on patients of rural and urban areas of Meerut district. For the comparison of various causes of subnormal vision, people were studied in the camps and OPD of upgraded department of ophthalmology, LLRM, Medical college, Meerut, during the study period of June 2009 –July 2010. The patients of subnormal vision for this study were divided into 2 groups. 1st group was of urban areas resident of Meerut City. 2nd Group was of Rural areas residents of peripheral village of Meerut District. Patients from Subnormal vision were screened for Refractive Errors, Cataract, Retinal Diseases, Amblyopia, Corneal Diseases, Optic Atrophy, Glaucoma, Others ocular diseases like Endophthalmitis, Higher visual pathway lesions, posterior capsule opacity after cataract surgery, and indeterminate causes of visual impairment. Visual acuity examination of each patient was taken by snellen's chart.

Results: The present study was carried out in the Upgraded department of ophthalmology. S.V.B.P. Hospital, L.L.R.M. medical college Meerut from June 2009 to July 2010. The study included 800 patient suffering from subnormal vision from the OPD of Eye department and Rural Camps. There were more patients from rural areas (63.5%) in comparison from urban areas (36.5%) attending the medical OPD and camps. out of 800 patients 417 (52.13%) were male while 383 (47.87%) were females. that patient presented with their complain were maximum no. from age group 16-49 years in rural and urban patient (51.9% and 62.28% respectively) that in rural areas males (55.73%) were suffering from subnormal vision more than female (44.29%). In urban areas females (54.2%) with subnormal vision are more than males (45.8%) this difference was found statistically significant. This may be because of lack of awareness in rural areas and ignorance of female in rural areas. Maximum no. was of patients of refractive error 366 (45.8%) and cataract 319(39.9%) other common diseases which were causing subnormal vision were retinal disorder, amblyopia, corneal disorders and others. The category of others include Endophthalmitis, Higher visual pathway lesion, posterior capsule opacity following cataract surgery and indeterminate cause of visual impairment. That refractive errors were more common in rural patient (48.03%) as compared to urban patients group (41.75%). Cataract was more common in Urban patients group (40.75%) as compared to Rural patient group (39.37%) but the difference was not statistically significant. Retinal disease, optic atrophy and glaucoma were more common in urban patients group as compared to rural patients group. The percentage of Retinal disease, optic atrophy, glaucoma were in urban patients 4.45% and 2.39% respectively. Amblyopia (3.3%) and corneal disease (2.36%) were greater in rural patients as compared to urban patients. Glaucoma prevalence was similar in both the groups. The category others was more common in urban patients (5.47%) as compared to Rural patients (1.96%)

Discussion: 800 people of subnormal vision (Vision less than 6/18) selected from rural and urban patients. The present study showed overall percentage of refractive error as 45.8% and cataract 39.9%, Retinal diseases 3.4%, Amblyopia 2.7% corneal disease 2.3%, optic atrophy 1.8%, Glaucoma 1% and others 3.2%. Considering the Rural and Urban patients refractive error, amblyopia, and corneal disease were more in rural patients (48.03%, 3.34%, 2.36%). Because children and females remain neglected for their problems and also take glasses as a social taboo.

Cataract, retinal disorder, optic atrophy, Glaucoma and Others were more common in urban patients (40.75%, 4.45%, 2.39%, 1.36% respectively) In urban area people have easy access to hospital and they keep on coming for regular checkups. Most of the studies found that refractive error was the most common cause of subnormal vision followed by Cataract similar to ours.

Conclusion: Uncorrected refractive errors and cataracts are the main cause of low vision in both urban and rural populations. An increase in ophthalmic care and public education is needed to minimize the irreversible blindness in rural as well as urban parts of society.

INTRODUCTION

Low vision or Subnormal vision is a term used to describe varying degree of vision loss that cannot be corrected by medication, surgeries or conventional glasses.

Vision loss may be due to:

- Decreased visual acuity
- Visual field defect
- Decreased contrast sensitivity
- Loss of colour perception

A low vision patient is one who has impairment of visual functions even after treatment and /or standard refractive correction, and has a visual acuity of less than 6/18 (20/60) to light perception or a visual field of less than 10 degree from the point of fixation. (Vision 2020 Report, action plan 2006-11 global initiative for the elimination of avoidable blindness) India was the first country in the world to launch the National Programme for Control Blindness in 1976 with the goal of reducing the prevalence of blindness. Of the total estimated 45 million blind persons (best corrected visual acuity <3/60) in the world, 7 million are estimated to be in India. Due to the large population base and increased life-expectancy, the number of blind particularly due to age-related disorders like cataract is expected to increase. India is committed to reduce the burden of avoidable blindness by the year 2020 by adopting strategies advocated for Vision 2020 — The Right to Sight. Thus, this study is being undertaken with an aim to know the prevalence of various causes of subnormal vision in rural and urban population and manage them at a proper time. Common Eye problems causing subnormal vision include. Refractive Errors, Cataract, Retinal diseases, Corneal diseases: Optic atrophy, Glaucoma and others.

MATERIALS AND METHODS

This study was carried out on patients of rural and urban areas of Meerut district. For the comparison of various causes of subnormal vision, people were studied in the camps and OPD of upgraded department of ophthalmology, LLRM, Medical college, Meerut, during the study period of June 2009 –July 2010. The patients of subnormal vision for this study were divided into 2 groups. 1st group was of urban areas resident of Meerut City. 2nd Group was of Rural areas residents of peripheral village of Meerut District.

Inclusion criteria

Visual acuity (uncorrected) <6/18

Visual field <10°. From the point of fixation.

The surveys were conducted in the camps of the rural areas of Meerut to estimate the various causes of sub normal vision in rural patients. Patients having subnormal vision due to any cause were referred to the upgraded department of ophthalmology, LLRM, Medical college, Meerut for further investigations and management purpose. Where Visual acuity, cycloplegic retinoscopy, Refraction, Ocular motility, Detailed Slit lamp examination, Contrast sensitivity, colour vision, IOP and fundus examination was done. Head position, Nystagmus, Alignment in straight ahead and peripheral gaze were also

noted, tonometry, gonioscopy, perimetry and OCT, corneal staining, schirmer's test, B Scan Ultrasound, FFA, CT Scan, MRI were done according to the need of the patients. All the cases of subnormal vision were thoroughly investigated clinically or otherwise as per requirement and managed at the referral centre. Patients of subnormal vision which are not benefitted by refraction or surgery, were helped by prescribing low vision aids in the Eye Department. Patients from Subnormal vision were screened for Refractive Errors, Cataract, Retinal Diseases, Amblyopia, Corneal Diseases, Optic Atrophy, Glaucoma, Others ocular diseases like Endophthalmitis, Higher visual pathway lesions, posterior capsule opacity after cataract surgery, and indeterminate causes of visual impairment. Among rural patients, Patients with subnormal vision of different age groups were included. In all 508 patients were examined. From which 283 were male and 225 were females. Information was collected on a predesigned and pretested schedule for each person including social demographic characteristic and other contributory factors and family history, past history and present symptoms. Survey in the camps was carried on the fixed days. A brief history was taken regarding age, occupation and education. History also included previous uses of glasses, ocular surgery and any other visual problems in the past. Visual acuity of each patient was taken by snellen's chart.

RESULTS

The study included 800 patient suffering from subnormal vision from the OPD of Eye department and Rural Camps. Out of which 63.5% were from Rural areas and 36.5% was from Urban area. The overall % of male and female was 45.8% and 54.2% respectively. In Urban patients, percentage of Male and Female was 45.8% and 54.2%, while in rural patients ,it was 55.73% and 44.29% respectively.

Table 1. Distribution of Patient According to Area

Area	No	%
Rural	508	63.5%
Urban	292	36.5%

Table-1 shows that there were more patients from rural areas (63.5%) in comparison from urban areas (36.5%) attending the medical OPD and camps.

Table 2. Sex distribution in study group

Sex	No	%
Male	417	52.13
Female	383	47.87
Total	800	100%

Table-2 shows out of 800 patients 417 (52.13%) were male while 383 (47.87%) were females.

Table 3. Age Distribution in study group

Age	No of Patients	%
0-15	228	28.5%
16-49	406	50.75%
>50	166	20.75%
Total	800	100%

Out of 800 patients, 228 (28.5%) were of less than 15 yrs of age group. Maximum number of patients 406 (50.75%) were of 16 to 49 yrs. of age group and 166 (20.75%) were of more than 50 yrs. of age group.

Table 4. Age distribution in rural and urban patients

Age Group	Rural(%)	Urban(%)
0-15	146(28.7)	82(28.8)
16-49	264(51.9)	142(62.28)
>50	98(19.29)	68(23.28)
Total	508(100)	292(100)

Table -4 shows that patient presented with their complain were maximum no. from age group 16-49 years in rural and urban patient (51.9% and 62.28% respectively)

Table 5. Sex distribution in rural and urban patients

Sex	Male	Female	Total
Rural	283 (55.73%)	225 (44.29%)	508(100%)
Urban	134 (45.8%)	158 (54.2%)	292(100%)

$X^2 = 7.16$ $df = 1$ $p < .01$

Table-5 shows that in rural areas males (55.73%) were suffering from subnormal vision more than female (44.29%) In urban areas females (54.2%) with subnormal vision are more than males (45.8%) this difference was found statistically significant. This may be because of lack of awareness in rural areas and ignorance of female in rural areas.

Table 6. Literacy of Patients

	Rural (%)	Urban (%)
Literate	284 (56%)	193 (66%)
Illiterate	224 (44%)	99 (34%)
Total	508 (100%)	292 (100%)

$X^2 = 8$ $df = 1$ $p < 0.05$

Table-6 shows that literacy was more in urban patients (66%) compared to rural patients (56%), which is statistically significant

Table 7. Various Causes of subnormal vision in study group

Causes of subnormal vision	No. of Patients	%
Refractive Error	366	45.8%
Cataract	319	39.9%
Retinal Disease	27	3.4%
Amblyopia	22	2.7%
Corneal Disease	18	2.3%
Optic Atrophy	14	1.8%
Glaucoma	8	1%
Others	26	3.2%

- Maximum no. was of patients of refractive error 366 (45.8%) and cataract 319(39.9%) other common diseases which were causing subnormal vision were retinal disorder, amblyopia, corneal disorders and others.
- The category of others include Endophthalmitis, Higher visual pathway lesion, posterior capsule opacity following cataract surgery and indeterminate cause of visual impairment.
- Table-8 Shows that refractive errors were more common in rural patient (48.03%) as compared to urban patients group (41.75%).
- Cataract was more common in Urban patients group (40.75%) as compared to Rural patient group (39.37%) but the difference was not statistically significant.

- Retinal disease, optic atrophy and glaucoma were more common in urban patients group as compared to rural patients group. The percentage of Retinal disease, optic atrophy, glaucoma were in urban patients 4.45% and 2.39% respectively.
- Amblyopia (3.3%) and corneal disease (2.36%) were greater in rural patients as compared to urban patients.
- Glucoma prevalence was similar in both the groups.
- The category others was more common in urban patients (5.47%) as compared to Rural patients (1.96%)

Table 8. Disease causing subnormal vision in Rural and Urban study group

Causes subnormal vision	Rural (%) No %	Urban (%) No (%)
Refractive Error	244 (48.03%)	122 (41.78%)
Cataract	200 (39.37%)	119 (40.75%)
Retinal disease	14 (2.75%)	13 (4.45%)
Amblyopia	17 (3.34%)	5 (1.71%)
Corneal Disease	12 (2.36%)	6 (2.05%)
Optic Atrophy	7 (1.37%)	7 (2.39%)
Glaucoma	4 (0.78%)	4 (1.36%)
Others	10 (1.96%)	16 (5.47%)
Total	508 (100%)	292 (100%)

$X^2 = 1.18$ $df = 1$ $p > 0.05$

Table 9. Sex distribution of various causes of subnormal vision

Diseases	Male	Female
	Rural + Urban (%)	Rural + Urban (%)
Refractive Error	164+66=230 (28.75%)	80+56=136 (17%)
Cataract	85+39=124 (15.5%)	115+80=195 (24.37%)
Retinal Disease	8+8=16 (2%)	6+5 = 11 (1.37%)
Amblyopia	10+3=13 (1.6%)	7+2 = 9 (1.12%)
Corneal Disease	5+3=8 (1%)	7+3 = 10 (1.25%)
Optic Atrophy	4+4=8 (1%)	3+3 = 6 (0.75%)
Glaucoma	2+2=4 (0.5%)	2+2 = 4 (0.5%)
Others	5+9=14 (1.75%)	5+7 = 12 (1.5%)
Total	417	383

Table – 9 shows that more male patient (28.75%) were affected from refractive error as compare to female patient (17%). Cataract was seen more in female patients (24.37%) as compared to male patient (15.5%), which is sttistically significant.

- Amblyopia was more or less common in both male and female patients (1.62% and 1.12% respectively).
- Corneal disease was more in female patient (1.25%) as compared to male (1%)
- Optic atrophy and glaucoma were same in both sexes. tal 85.6% benefitted from refraction and cataract surgery and any other surgery.

DISCUSSION

The present study showed overall percentage of refractive error as 45.8% and cataract 39.9%, Retinal diseases 3.4%, Amblyopia 2.7% corneal disease 2.3%, optic atrophy 1.8%, Glaucoma 1% and others 3.2%. Considering the Rural and Urban patients refractive error, amblyopia, and corneal disease were more in rural patients (48.03%, 3.34%, 2.36%). Because children and females remain neglected for their problems and also take glasses as a social taboo. Cataract, retinal disorder, optic atrophy, Glaucoma and Others were more common in urban patients (40.75%, 4.45%, 2.39%, 1.36% respectively) In urban area people have easy access to hospital and they keep on coming for regular checkups. Considering the male and

female refractive error, retinal disease amblyopia were more common in males and cataract, corneal disease are more common in female patients. Tien Yin Wong *et al.* did a study to see the prevalence and causes of low vision and blindness in an urban malay population according to which Cataract was the main cause of presenting unilateral (38.9%) and bilateral (65.2%) blindness, whereas undercorrected refractive error was the main cause of presenting unilateral (68.8%) and bilateral (52.2%) low vision. According to Lingam Vijaya *et al.* the primary causes for low vision were refractive errors (68%) and cataract (22%) (IJO, 2014) Karki *et al.* (2006) found amblyopia in young adults 5.97%. (KUMJ 2006) Vashisht *et al.* (2010) done a study for prevalence of cataract in older patients in India. The % of cataract in people age >60 yrs was 58% in North India and 53% in South India. Which correlates with our results. Dandone *et al.* (2003) found corneal blindness. Prevalence 0.66%. (Ophthalmology, 2011) Most of the studies found that refractive error was the most common cause of subnormal vision followed by Cataract. Similar results were found in present study which is showing 45.8% and 39.9% patients suffering from Refractive errors and Cataract.

Conclusion

Uncorrected refractive errors and cataracts are the main cause of low vision in both urban and rural populations. An increase in ophthalmic care and public education is needed to minimize the irreversible blindness in rural as well as urban parts of society.

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