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Prevalence and Factors Leading To Low Vision in Adults Attending Ophthalmology Opd

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ABSTRACT

Background:
Low vision is defined as visual acuity of less than 6/18 but equal to or better than 3/60 in the better eye with the best possible correction.Causes of low vision could be multiple like age related macular degeneration, glaucoma, uveitis, diabetic retinopathy, hypertensive retinopathy ,retinitis pigmentosa, albinism, cortical visual impairment, uncorrected refractive errors, ambylopia. Most patients are elderly, although all age groups are affected .Low vision may decrease a patient's quality of life substantially, leading to emotional distress and possibly depression. Early referral may lead to improved outcomes.

Objective:
To determine the prevalence of low vision among adults seen in OPD and also identifying the eye conditions or diseases causing low vision and also to investigate the relationship between demographic factors such as age and gender with low vision.

Methods:
A descriptive observational study on 200 patients aged 18 years and above attending the outpatient clinic of Department of Ophthalmology of Navodaya Medical College Hospital and Research Centre with BCVA of less than 6/18 were included in the study over a period of 18 months. After thorough ocular examination ,slit examination, IOP monitoring, fundus examination helped us to find the cause and treat the patients.

Results:
Mean age of patients in the study was 49.57 +/- 19.9 years .Male to female ratio 2.07 .88% of patients were from lower socio-economic status .Prevalence of blindness in our study was 40% .Prevalence of mild visual impairment was 3% , moderate impairment was 49.5% , severe impairment was 7.9% . Prevalence of diabetes in our study was 23.5% , hypertension was 33.5% . Causes of low vision revealed, glaucoma in 65% , ARMD in 14%,uncorrected refractive error in 13% , diabetic retinopathy with CME in 7%, CRVO in 5% , retinal detachment in 7% , retinitis pigmentosa in 2%

Conclusion:
The main causes of visual impairment were glaucoma, ARMD , uncorrected refractive error. Early detection and appropriate management of conditions mentioned above will reduce the burden of ocular morbidity .

Keywords: low vision , quality of life, diabetic retinopathy

I. INTRODUCTION

In the practice of eye care ―LOW VISION has a specific meaning as defined by WHO. Low vision as defined by WHO is ―A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degree from the point of fixation, but who uses, or is potentially able to use, vision for planning and/or execution of a task. Under this definition persons who would benefit from low vision care also exist among those who are currently categorized as blind.[1]

Eye diseases, vision loss and resulting disability remain major public health concerns.[2]

It has been estimated that, globally, 253 million people are visually impaired, out of which36 million are blind and 217 million have moderate to severe visual impairment (VI).[3]

The report, launched ahead of World Sight Day on 10 October, found that ageing populations, changing lifestyles and limited access to eye care, particularly in low- and middle-income countries, are among the main drivers of the rising numbers of people living with vision impairment.[4,5,6,7]

II. OBJECTIVES

1) To determine the prevalence of low vision among adults attending Navodaya medical college, Raichur.

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2) To identify eye conditions or diseases causing low vision.
3) To estimate the relationship between demographic factors such as age and gender with low vision

III. MATERIALS AND METHODS

Study setting: Ophthalmology OPD of Navodaya Medical College, Raichur,

Study population:

Patients attending Ophthalmology OPD of a Navodaya Medical College, Raichur, in whom low vision was suspected due to many causes including glaucoma,ARMD, uncorrected refractive errors(amblyopia), retinitis pigmentosa, diabetic retinopathy and hypertension.

Study period: 18 months

Study design: Descriptive observational study

Sample size:200 patients

Formula for sample size calculation:

(**Source for formula:** Source: Patrikar S. In Text book of Community Medicine.1st Ed, 2009.Ed. Bhalwar R. Dept of Community Medicine. AFMC Pune. Publ. WHO India Office, New Delhi)

n= (〖Z1〗^2 {P(1-P))/d^2

Sampling technique: Simple random sampling

Inclusion criteria:

- All patients aged 18 years and above presenting with best corrected visual acuity of less than 6/18 but equal to or greater than 3/60 in the better eye or those with significant visual field loss (corresponding visual field loss to less than 20 degrees).
- Patients willing to participate in study after written consent

Exclusion criteria:

- Patients who had psychiatric problems.
- Patients whodid not consent to participate in the study.
- Patients with morbid medical conditions.
- Patients with pediatric age group.
- Patients with treatable causes like cataract, pterygium etc are excluded.

Variables used in study: Age, gender, vision, visual acuity, causes etc.

Methods of data collection:

A Snellens illiterate E acuity chart will be used to measure presenting pinhole and best corrected visual acuity. Pinhole disc will be used to detect if reduced visual acuity (VA) is due to refractive error or eye disease anomaly. Where reduced VA was due to refractive error, ophthalmic lenses will be used to compensate for the refractive error using subjective refraction and best corrected VA will be measured and recorded. Comprehensive slit lamp examination for anterior segment and ophthalmoscopic examination done to view the fundus picture. Applanation tonometry used to measure IOP. Perimetry done to see the visual fields for required patients. A comprehensive eye examination will be conducted. After obtaining the written consent, detailed case history, clinical examination of the patient recorded on a detailed proforma.

Statistical analysis and methods:

Data will be collected by using a structure proforma. Data entered in MS excel sheet and analysed by using SPSS 24.0 version IBM USA. Qualitative data will be expressed in terms of proportions. Quantitative data will be expressed in terms of Mean and Standard deviation. Association between two qualitative variables will be seen by using Chi square/ Fischer‘s exact test. Comparison of mean and SD between two groups will be done by using unpaired t test to assess whether the mean difference between groups is significant or not. Descriptive statistics of each variable will be presented in terms of Mean, standard deviation, standard error of mean. A p value of <0.05 will be considered as statistically significant whereas a p value <0.001 will be considered as highly significant.

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IV. RESULTS

Table 1: Distribution according to age group

		Frequency	Percent
Age group in years	< 20	16	8.0
	21-30	37	18.5
	31-40	14	7.0
	41-50	22	11.0
	51-60	44	22.0
	> 60	67	33.5
	Total	200	100.0

We included total 200 patients attending Ophthalmology OPD of Navodaya Medical College, Raichur, in whom low vision was suspected. Majority of the patients were from above 60 years age group i.e. 67(33.5%) followed by 44 patients i.e. 22% from 51-60 years age group, 37(18.5%) from 21-30 years age group, 22(11%) from 41-50 years age group, 16(8%) from less than 20 years and 14(7%) from 31-40 years age group. Mean age of the study population was 49.57±19.19 years.

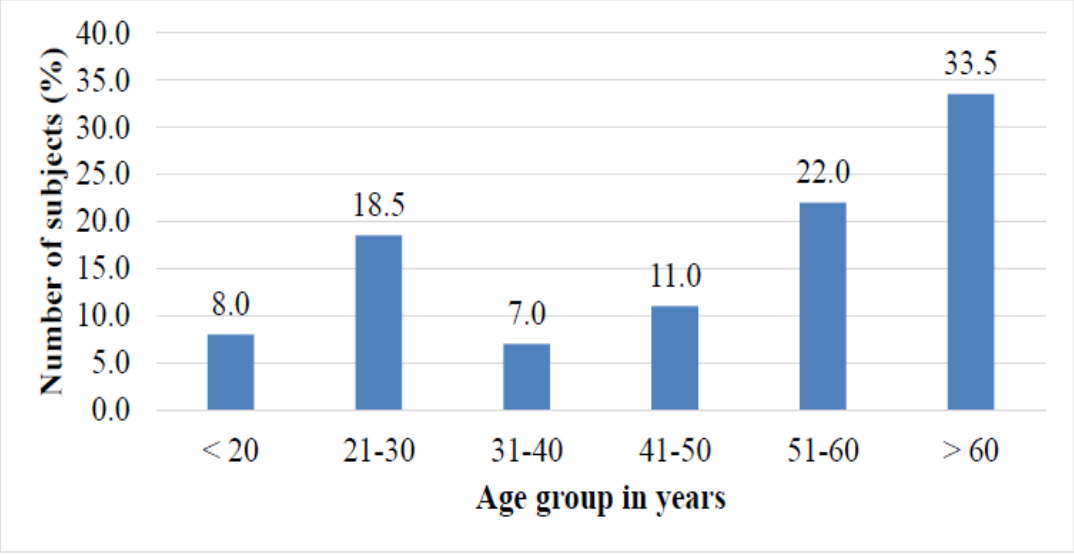

Figure 1: Bar diagram showing Distribution according to age group

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Table 2: Distribution according to gender

		Frequency	Percent
Gender	Male	135	67.5
	Female	65	32.5
	Total	200	100

Majority of the patients were male in our study i.e. 135 (67.5%) and remaining were females i.e. 65(32.5%). Male to female ratio was 2.07:1

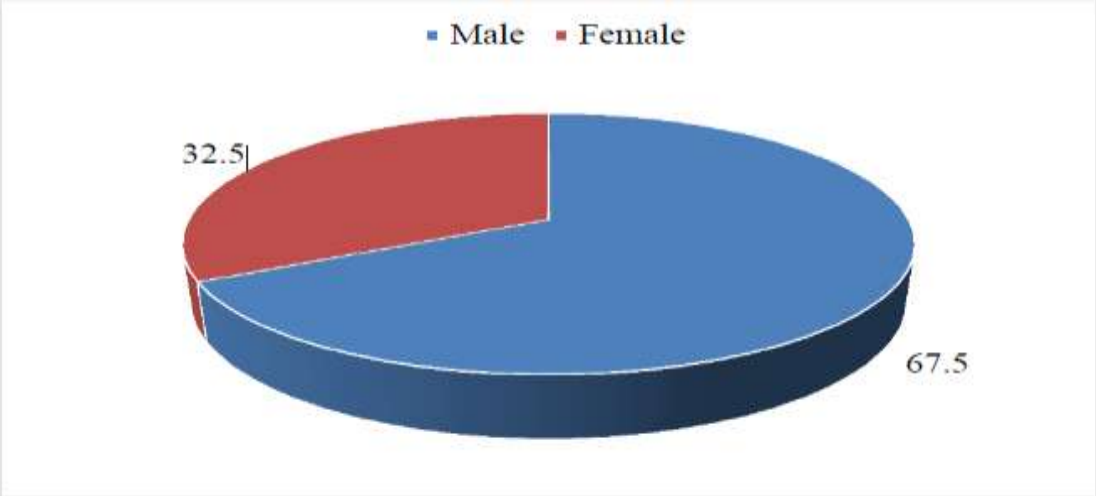

Figure 2: Pie diagram showing Distribution according to gender

Table 3: Distribution according to locality

		Frequency	Percent
Locality	Rural	140	70.0
	Urban	60	30.0
	Total	200	100.0

140 patients i.e. 70% were from rural area and 60(30%) from urban area

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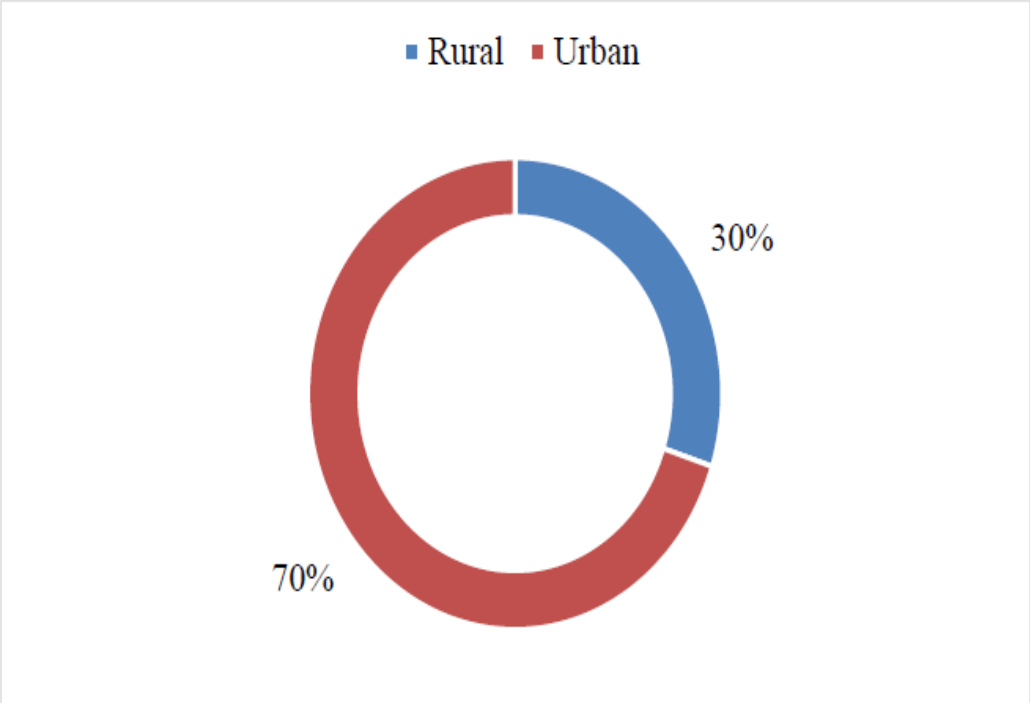

Figure 3: Pie diagram showing Distribution according to locality

Table 4: Distribution according to grades of blindness

		Frequency	Percent
Grade of visual impairment	Mild	6	3.0
	Moderate	99	49.5
	Severe	15	7.5
	Blindness	80	40.0
	Total	200	100.0

Prevalence of blindness in our study was 40%. Prevalence of mild visual impairment was 3%, moderate impairment was 49.5% and severe impairment was 7.5%.

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Figure 4: Bar diagram showing Distribution according to grades of blindness

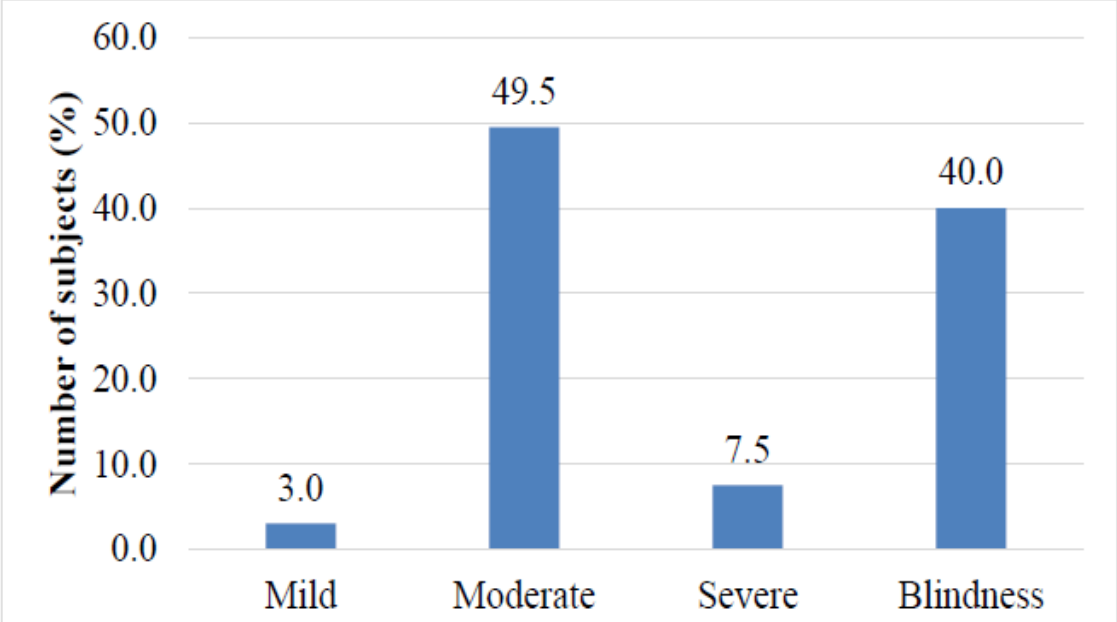

TABLE 5-PREVALENCE OF DIABETES

		Frequency	Percent
DM	Present	47	23.5
	Absent	153	76.5
	Total	200	100.0

Prevalence of diabetes in our study was 23.5%

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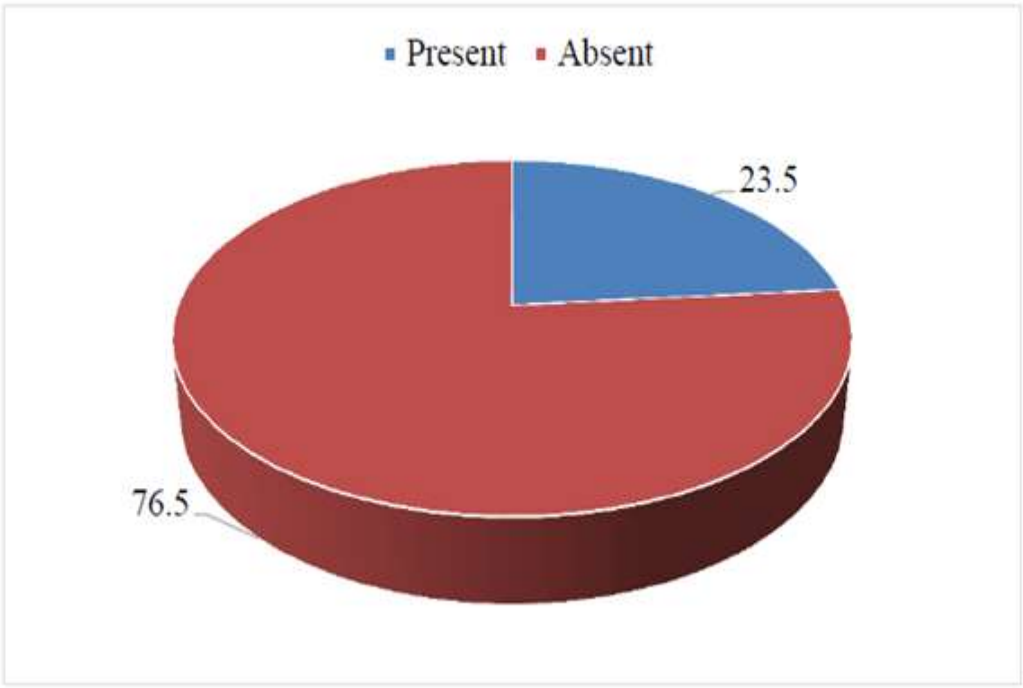

FIGURE 5-Pie diagram showing prevalence of diabetes

Table 6: Distribution according to etiology

		Frequency	Percent
	Cornea	23	11.5
	Glaucoma	65	32.5
	Macula	36	13.0
	Optic nerve	3	1.5
	Retina	47	23.5
	Uncorrected refractive error	26	13.0
	Total	200	100.0

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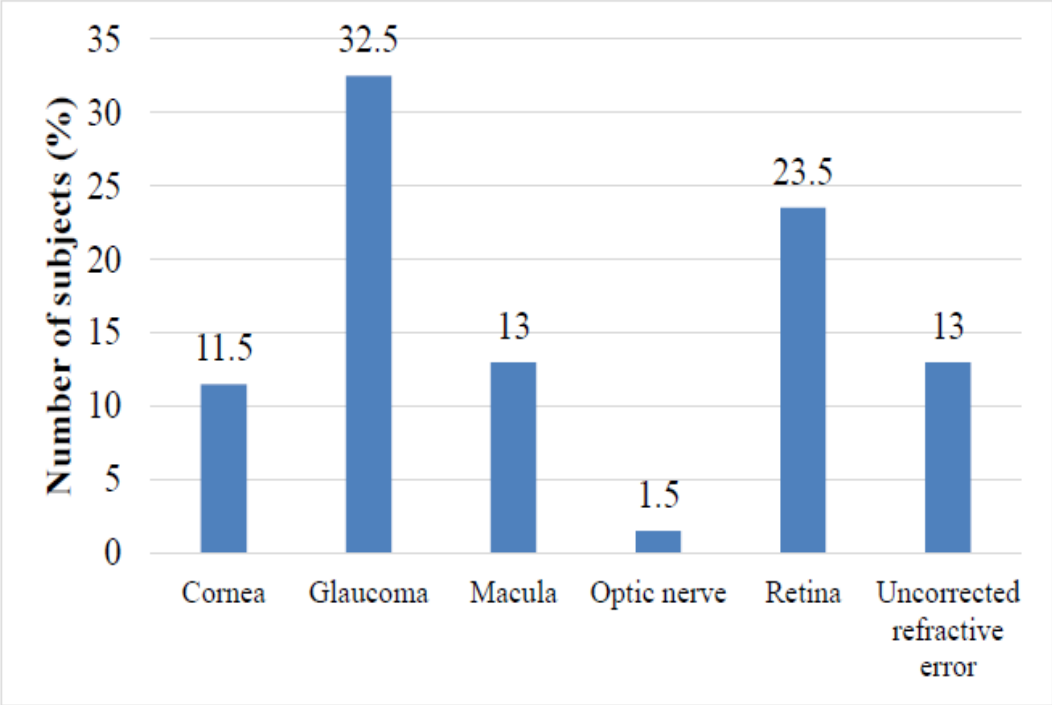

Figure 6-bar graph showing distribution according to etiology

Table 7: Distribution according to etiology.

	Frequency	Percent
CORNEA		
Corneal opacity	23	12.5
GLAUCOMA		
Glaucoma	65	32.5
RETINA		
CRVO	10	5.0
Diabetic retinopathy	14	7.0
RD	14	7.0
Retinitis pigmentosa	4	2.0
High myopia	2	1.0
Pathological myopia	3	1.5
MACULA		
Macular hole	8	4.0
ARMD	28	14.0
OPTIC NERVE		
Optic atrophy	3	1.5
Uncorrected refractive error	26	13.0

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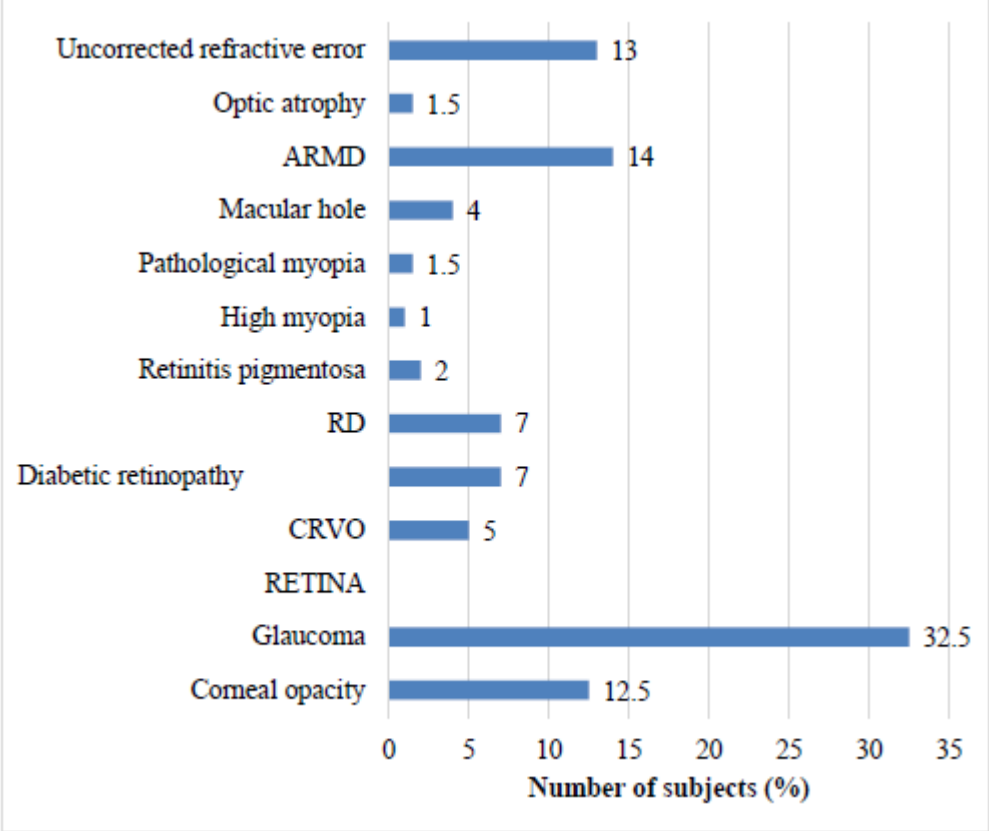

Figure 7-bar diagram showing distribution according to etiology and gender

V. DISCUSSION

Demographic information

We included total 200 patients attending Ophthalmology OPD of Navodaya Medical College, Raichur, in whom low vision was suspected. Majority of the patients were from above 60 years age group i.e. 67(33.5%) followed by 44 patients i.e. 22% from 51-60 years age group, 37(18.5%) from 21-30 years age group, 22(11%) from 41-50 years age group, 16(8%) from less than 20 years and 14(7%) from 31-40 years age group. Mean age of the study population was 49.57±19.19 years.

Majority of the patients were male in our study i.e. 135 (67.5%) and remaining were females i.e. 65(32.5%). Male to female ratio was 2.07:1.

Malhotra S. et al8in 2015 conducted the study in rural population of Jhajjar district, Haryana, north India to assess the prevalence of low vision and reported that the mean age (SD) of the examined persons was 62.9 (9.7) years, and was similar for both men (63.1 (9.9) years) and women (62.9 (9.5) years).

Sapkota K et al9in 2015 involved 100 patients of low vision in their study at in the low-vision clinic of Nepal Eye Hospital. They reported that mean age was 32.53 ± 22.90 years, with a range of 4–85 years which is very less as compared to our study findings. About two-thirds (71.5%, 98) of the patients were male. The mean age of the male was 34.05 ± 22.85 years while that of female was 28.69 ± 22.89 years. There was significant difference in the numbers of males and females in terms of the age group.

Prevalence of low vision

Prevalence of mild visual impairment was 3%, moderate impairment was 49.5% and severe impairment was 7.5%.

We also observed that the cause of low vision varies significantly according to age in our study ($p<0.05$). We also observed that there was no statistically significant association of gender with etiology of low vision.

Malhotra S. et al[8]in 2015 at in rural population of Jhajjar district, Haryana, north India and reported that the prevalence of low vision as 24.5% (95% CI 21.1 to 26.3) which was less as compared to our findings

KatibehM et al[10]in 2015conducted the study in in Yazd, central Iran and reported that the standardized prevalence of low vision was 4.4% respectively which was significantly associated with older age and female sex which was less as compared to our findings.

He Y. et al[11]in 2020 conducted the study in in Chinese people over the age of 50 years in Shaanxi Province andreported that the prevalence of low vision was 8.2% which was less as compared to our findings. There were no statistically significant differences between genders in the prevalence of low vision (P>.05). The prevalence of low vision was higher among older individuals (P<.05).

The reported prevalence of low vision in adults aged >50 years in a newly formed southern state of Telangana was 23.5% (95% CI 22.1 to 25.0) by **Marmamula S in 2016.**[12]

In an urban setting of Delhi within north India, the prevalence of low vision was reported slightly lower as 18.5% (95% CI 16.4 to 20.6) by **Gupta et al**[13]**in 2015**.

It is postulated that socioeconomic factors influence the health-seeking behaviour of individuals in terms of accessibility and affordability for eye care services. Also, low vision can contribute to the individuals‘ and their families‘ socioeconomic status.[14]

In terms of prevalence, the global prevalence of glaucoma is estimated at 3.54%.[20]The studies showing the prevalence of glaucoma between 0.94% to 4.73% among them in various part of Asia[21],[22]with angle-closure glaucoma being more frequent among Asian populations.

India with increasing greying of the population, is expected to become the second largest home of glaucoma by 2020. The estimated prevalence of glaucoma cases in India is reported to be 11. million. [23]This prevalence of glaucoma in India is not the same at every place, with varying prevalence among different populations and subgroups having rate of being 2.3 – 4.7%.[24,25,26]

Age is known to be the major risk factor for POAG, as the prevalence increase as people get older.[27,28]

Causes of low vision

Causes of low vision revealed that in majority of the patient glaucoma was most common cause (32.5%). This is followed by ARMD in 14%, uncorrected refractive error(ambylopia) in 13%, corneal opacity in 12.5%, Diabetic retinopathy and RD in 7% each.CRVO in 5%,retinitis pigmentosa in 2%,pathological myopia in 1.5%,high myopia in 1%,macular hole in 4%,optic atrophy in1.5%.

Malhotra S. et al[8]in 2015 at in rural population of Jhajjar district, Haryana, north India and reported that reported that the most common causes of low vision were uncorrected refractive errors (50%) .The central corneal opacities resulted in 65% of low vision. The low vision in study participants was found to be associated with age, gender, marital and educational status.

Sapkota K et al[9]**in 2015** involved 100 patients of low vision in their study at in the low-vision clinic of Nepal Eye Hospital. They reported that causes of low vision are nystagmus (30.70%), high refractive error (22.62%), retinitis pigmentosa (15.30%) and age-related macular degeneration (13.10%). Many studies worldwide have reported a higher prevalence of low vision among women.[17,18,19]

VI. CONCLUSION

The main causes of low vision were glaucoma ,age related macular degeneration, uncorrected refractive errors(ambylopia). Glaucoma is treatable by anti glaucoma medications and follow up of the patients, all these methods will significantly reduce the burden of low vision among patients .

Low vision specialists aim to maximize the remaining vision of a patient by providing optical aids,telescopes,orientation and mobility training ,psychosocial support and other methods of rehabilitations.Innovations in technology and devices offer additional options in low vision rehabilitation.

Also, early detection and appropriate management of glaucoma will reduce the burden of this ocular morbidity. A significant proportion of these prevailing ocular morbidities are avoidable and with appropriate management, visual impairment is preventable.

Strengthening awareness programmes and screening campaigns (with appropriate screening equipments) will provide an opportunity for identifying potentially blinding conditions (such as glaucoma and retinopathies) before they cause visual loss.

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