



## A CLINICAL STUDY OF PRESBYOPIA IN REGIONAL EYE HOSPITAL

**Dr.Pallamreddy Niveditha M.S**

Assistant Professor of Ophthalmology, Kurnool Medical College & Regional Eye Hospital, Kurnool, Andhra Pradesh. Corresponding Author

**Dr.S.Sivapriya M.S**

Postgraduate in Ophthalmology, Kurnool Medical College & Regional eye Hospital, Kurnool, Andhra Pradesh.

**Dr M. Premanadam M.S.**

Associate Professor of Ophthalmology, Kurnool Medical College & Regional Eye Hospital, Kurnool, Andhra Pradesh.

**KEYWORDS :** PRESBYOPIA REGIONALEYEHOSPITAL

### INTRODUCTION

Accommodation is the process by which the dioptric power of the eye is adjusted to see objects that are situated at different distances from the eye.

Presbyopia is an age-related visual impairment. It results from the gradual decrease in accommodation expected with age and results in an inability to read small print or do near work without the additional aid of suitable lens. This disability usually occurs around 40 to 45 years, but in India, it sets in by 38 to 40 years<sup>1</sup>. Presbyopia can have multiple effects on quality of vision and quality of life. Though not incapacitating if corrected; Presbyopia without optical correction results in an inability to perform once-effortless near tasks at a customary working distance without experiencing visual symptoms. The impact of this process varies from one person to another. Those who are involved in more frequent or more demanding near vision tasks are likely to have more difficulty<sup>2</sup>. Because the need to read and work at near and intermediate distances is important in all industrialized societies, presbyopia has both clinical and social significance. Hence it is proposed to evaluate clinically on Presbyopia and its relation to various factors.

### AIMS AND OBJECTIVES

Presbyopia is an important problem affecting quality of life in middle aged and beyond. The main aim of our present study is to evaluate clinically the common age related problem presbyopia and its relationship to refractive errors and other influencing factors.

### MATERIALS AND METHODS

Patients attending the out-patient department of Regional Eye Hospital, Kurnool were randomly chosen for this clinical study from 2010 to 2012

1. All selected patients were 35 years old and above, having near vision problems and reporting for the first time to the outpatient department.
2. Information regarding education and occupation was collected from each patient.
3. History of associated ocular problems like glaucoma and its treatment was elicited in all cases.
4. Complete history about consumption of alcohol, smoking, trauma, debilitating diseases like Tuberculosis, pain abdomen, hypertension, Diabetes, Psychiatric illness, and prolonged use of anti depressants, anti histamines, anti spasmotic etc., was elicited.
5. Thorough general examination was carried out for all the patients.
6. Visual acuity for distance was assessed using Snellens distant visual acuity chart at 6 meter distance. Refraction was attempted on all subjects who presented with a visual acuity worse than 6/6 in either eye.
7. Near visual acuity was assessed using near vision chart at working distance for each individual after correcting for their distance vision.
8. Binocular and uniocular near point of accommodation was measured in each patient using Royal Air Force near point rule

with their distance correction in place. Reciprocal of NPA in meters is the amplitude of accommodation. Near point of convergence was measured with RAF rule.

9. Orthoptic examination was carried out to assess convergence and its anomalies and phorias.
10. A detailed ophthalmological examination was carried out including external eye examination, assessment of pupillary reaction, and slit lamp biomicroscopy for anterior segment abnormalities; measurement of intraocular pressures (IOP) with a Goldmann applanation tonometer; dilation; and a detailed examination of the lens, vitreous, and posterior segment.
11. Retinoscopy under mydriasis was performed in all the cases to assess the refractive status of the patient.

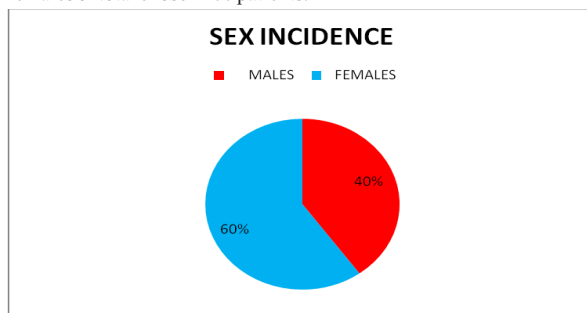
### OBSERVATIONS AND DISCUSSION

A total 100 cases complaining of near vision problems were picked up randomly for our study during the period from 2010 to 2012 stretching over a period of 2 years. All the patients reported for the first time to the out-patient department of Regional Eye Hospital, Kurnool.

**TABLE: 1**  
**SEX INCIDENCE**

SEX	NO.OF CASES
MALES	40
FEMALES	60

In this random selection the number of males was 40 % as against 60% females of total chosen 100 patients.



**TABLE: 2**  
**AGE INCIDENCE**

AGE GROUPS	NO.OF CASES	PERCENTAGE
35 – 39 years	34	34%
40 – 44 years	35	35%
45 – 49 years	19	19%
50 – 55 years	12	12%

On categorizing the patients age wise into 4 groups as shown in the above table we have noted that 35% of patients belonged to the age

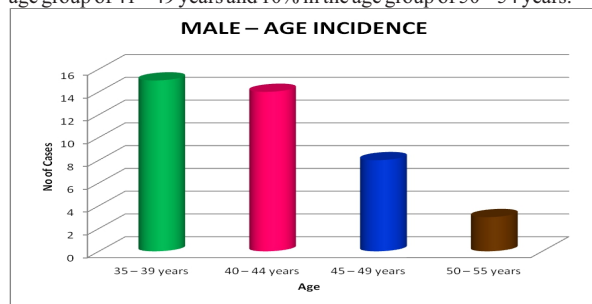
group of 40 – 44 years. Next category of patients fell in the age group of 35 – 39 years. There are 19% patients in the age group of 45 – 49 years age group. 12% patients fell in the age group of 50 – 54 years.

The result of our study indicates that the average age of onset of Presbyopia was 47.33 years. Mean age of persons among those aged 35 – 39 years was 37.85 years. These results are similar to the Andhra Pradesh eye study conducted by Praveen K Nirmalan et al<sup>3</sup> in 2006. Chattopadhyaya et al<sup>2</sup> 1984 reported the average age of onset of presbyopia among Bengali population was 35 years. Rambo<sup>4</sup> in 1957 reported that in Indian population presbyopia developed at the age of 37 1/2 years. Duane in 1915 reported that the age of onset ranged from 38 – 48 years.

**TABLE: 3**  
**MALE – AGE INCIDENCE**

AGE GROUP	NO.OF CASES	PERCENTAGE
35 – 39 years	14	35%
40 – 44 years	14	35%
45 – 49 years	08	20%
50 – 54 years	04	10%

On categorizing male patients into similar age groups as above we have noted that 35% cases belonged to pre presbyopic age. 35% cases fell in the age group of 40 – 49 years. There were 20% patients in the age group of 41 – 49 years and 10% in the age group of 50 – 54 years.



**TABLE: 4**  
**FEMALE – AGE INCIDENCE**

AGE GROUP	NO.OF CASES	PERCENTAGE
35 – 39 years	20	33.33%
40 – 44 years	21	35%
45 – 49 years	11	18.33%
50 – 54 years	08	13.33%

Female patients were categorized similarly as males and found that 33.33% of patients were presenting in the pre presbyopic age. 35% patients fell in the age group of 40 – 44 years age, 18.33% patients fell in the group 45 – 49 years age and 13.33% patients fell in the group 50 – 54 years age.

On comparing the tables 3 and 4, we found that majority of females developed presbyopia more rapidly than males.



**TABLE: 5**  
**MEAN AMPLITUDE OF ACCOMMODATION IN DIFFERENT AGE GROUPS**

AGE GROUP	MEAN AMPLITUDE IN DIOPTERS
35 – 39 years	3.12
40 – 44 years	2.54
45 – 49 years	1.88
50 – 54 years	1.56

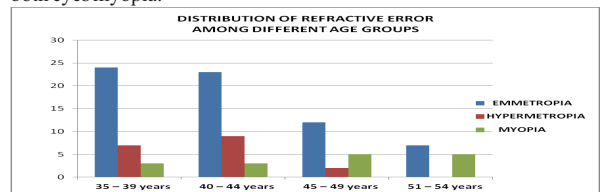
Average amplitude of accommodation is calculated in relation to age

groups and found that the mean amplitude of accommodation was 3.12 D for the patients belonging to the age group of 35 – 39 years, 2.54 D for the age group of 40 – 44 years, 1.88 D for the 45 – 49 years age group, 1.56 D for the 50 – 54 years. These above figures tallies with similar results found by Chattopadhyaya et al<sup>5</sup> (1984) study in Bengali population with minor difference.

**TABLE: 6**  
**DISTRIBUTION OF REFRACTIVE ERROR AMONG DIFFERENT AGE GROUPS**

AGE GROUP	EMMETROPIA	HYPERMETROPIA	MYOPIA
35 – 39 years	24	7	3
40 – 44 years	23	9	3
45 – 49 years	12	2	5
51 – 54 years	7	-	5
Total	66	18	16

In our study 66 patients were having both eyes emmetropia, 18 patients were having both eyes hypermetropia, and 16 patients were having both eyes myopia.



**TABLE: 7**  
**AMPLITUDE AND REFRACTIVE ERRORS**

AGE GROUP	EMMETROPIA	HYPERMETROPIA	MYOPIA
35 – 39 years	3.16	2.71	3.47
40 – 44 years	2.52	2.34	3.23
45 – 49 years	1.94	1.69	1.85
50 – 54 years	1.48	-	1.55

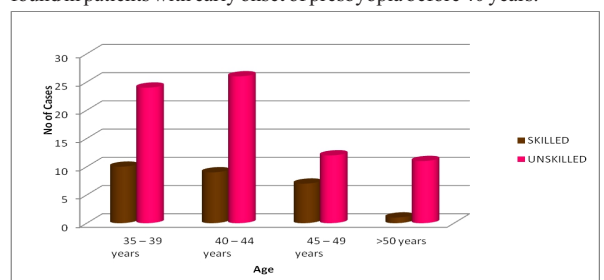
Mean amplitude of accommodation is calculated in relation to refractive status among different age groups and found that mean amplitude is higher among myopes between 35 – 44 years when compared to hypermetropes and emmetropes. The results study conducted by Lekha Mary Abraham et al.<sup>6</sup> in 2005 showed higher amplitude of accommodation among myopes between 35 – 44 years compared to emmetropes and hypermetropes.

**TABLE: 8**

AGE GROUP	SKILLED	UNSKILLED
35 – 39 years	13	21
40 – 44 years	10	25
45 – 49 years	2	15
>50 years	0	12
TOTAL	26	74

Of chosen 100 patients 74% were unskilled against to the skilled professionals who accounted only 26%. Among skilled professionals most patients are presenting with near vision problems before 44 years.

On eliciting history of significant ocular and systemic diseases said to hasten the process of onset of presbyopia the following results were found in patients with early onset of presbyopia before 40 years.



**TABLE 9**

HISTORY	NO.OF CASES
No significant history	19
Chronic alcoholism	6
Tuberculosis	3

Asthma	4
Hypertensives on treatment	1
Anti spasmodic	1

On analyzing the above data we found that most of the patients presenting with near vision problems in less than 40 years of age gave significant positive history for systemic illness. Of total 34 cases 6 patients were suffering from chronic malady of alcoholism, 3 patients gave positive history of tuberculosis had underwent full course of anti tuberculosis treatment, 4 patients with positive history of asthma were under treatment. There was only one patient receiving treatment for hypertension and one patient using antispasmodics.

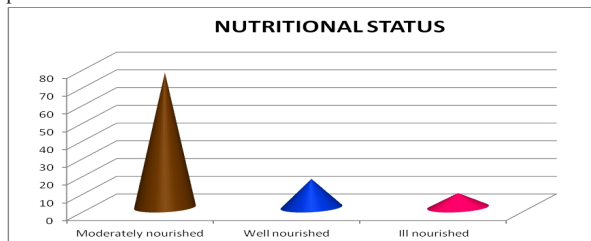
Hofstetter (1942)<sup>9</sup> described debilitating diseases as the causes for accommodative insufficiency. Daniels (1927) found accommodative failure in chronic alcoholics. The results of Campbell H E et al.<sup>8</sup> in 2001 indicate that chronic alcohol use can adversely affect subjective static accommodation, especially in younger alcoholics. Study of Praveen K Nirmalan et al.<sup>1</sup> also found an association between alcohol consumption and presbyopia.

**TABLE 10**

NUTRITIONAL STATUS	NO. OF CASES
Moderately nourished	76
Well nourished	15
Ill nourished	9

In our study, we came across 76 (76%) patients who were moderately nourished. 15 (15%) cases were well nourished and only 9 (9%) were ill nourished.

Hofstetter (1942)<sup>9</sup> pointed out nutritional status as one of the influencing factor for accommodative insufficiency. So in our study due importance is given to estimate the nutritional status of the patients.



**TABLE 11**

**MEAN SEVERITY IN DIOPTERS – SEX DISTRIBUTION**

AGE GROUP	MALES	FEMALES
35 – 39 years	1.16	1.1
40 – 44 years	1.44	1.45
45 – 49 years	1.75	1.77
50 – 54 years	2	2.25

On analysis of degree of presbyopia in terms of add power our study showed that the severity of presbyopia is slightly higher in females than males.

Hickenbotham et al (2012)<sup>10</sup> suggested that increased association of presbyopia for women is not due to a physiologic difference in accommodation but rather due to other sex differences, such as tasks performed and viewing distances. Age-based correction nomograms for presbyopia should therefore consider these sex differences when prescribing add powers for near tasks.

**SUMMARY AND CONCLUSION**

In our study 100 patients were taken randomly for near vision problems. Most of the patients developed presbyopia in the early age group.

Females show more preponderance than males in the pre presbyopic age groups.

With increasing age there was decline in the amplitude of accommodation. Mean amplitude of accommodation was higher in myopes than in hypermetropes and emmetropes.

Alcohol consumption, Debilitating diseases like tuberculosis, drugs like anti spasmodic and anti depressants contribute to the early onset of presbyopia.

Earlier onset of presbyopia was observed in hypermetropes than in myopes.

Skilled persons who do a lot of close work have early onset of presbyopia.

**REFERENCES**

- Lalit P. Agarwal : Agarwal’s principles of optics and Refraction, fifth edition, section V, 159-169, 2009.
- Gary L: Care of the patient with presbyopia. Optometric clinical practice guide lines, 2006; 1:3-5.
- Nirmalan PK, Krishnaiah S, Shamanna BR, Rao GN, Thomas R. A population based assessment of presbyopia in the state of Andhra Pradesh, South India: The Andhra Pradesh Eye study; Invest Ophthalmol visual science; 47:2324-2328, 2006.
- Rambo VC: sangal S.P. Study of accommodation of the people of India, Am J Ophthalmol; 49:993-1004, 1960.
- Chattopadhyay DN, Seal GN: Amplitude of accommodation in different age groups and age of onset of Presbyopia in Bengali population, Indian J Ophthalmol; 32:85-7, 1984.
- Lekha Mary Abraham, Thomas Kuriakose, Viswanathan Sivanandam, Nithya Venkatesan et al: Amplitude of accommodation and its relation to refractive errors, Indian J Ophthalmol; 53:105-108, 2005.
- Schachar RA, Anderson DA: The mechanism of ciliary muscle function. Ann Ophthalmol, 27:126–32, 1995.
- Campbell H, Doughty MJ, Heron G, Ackerley RG. Influence of chronic alcohol abuse and ensuing forced abstinence on static subjective accommodation function in humans. Ophthalmic Physiol Opt. 2001 May; 21(3):197-205.
- Hofstetter H.W: Factors involved in low amplitude cases, Am J Optom Physiol Opt, 19:279-89, 1942.
- Hickenbotham A, Austin Roorda, Craig Steinmaus, and Adrian Glasser, Meta analysis of sex difference in Presbyopia, Invest Ophthalmol Vis Sci; 53:3215–3220; 2012.