



Prevalence of Presbyopia in a University Community in North Central Nigeria

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ABSTRACT

Aim: To determine the prevalence of presbyopia among patients presenting to the Eye Clinic of the University Health Services, Jos Plateau State.

Methods: A study of all new and old patients who visited the eye clinic of university health services between March 2019 and March 2020 was conducted. The records of all patients 35 years and above were reviewed retrospectively for details regarding patient's name, age, sex, occupational status, medical history and basic eye examination including distant and near visual acuities. Presbyopia is defined as the addition of at least 1.00 diopter sphere to improve near vision to at least N5 or unable to read N5 at a distance of 40 cm with the distance correction.

Results: A total of 191 patients record was reviewed. Ninety-seven (51.6%) were females and ninety-one (48.4%) were males. The prevalence of presbyopia was found to be 66.5%. Most patients with presbyopia were emmetropic followed by combined hyperopia with presbyopia.

Conclusion: presbyopia is common among those presenting to the eye clinic of university health services, Jos. Cost was the commonest reason why those not using presbyopia spectacles gave. Therefore, increasing availability of affordable refractive services would help to improve the uptake of spectacle among the presbyopes.

INTRODUCTION

Presbyopia is the gradual loss of accommodation with increasing age resulting in a reduced ability to focus on near objects.[1] It is the most common physiological change occurring in the adult eye and is thought to cause universal near vision impairment with advancing age.[1] The amplitude of accommodation decreases with age and symptoms may manifest around the age of 40 years. However, symptoms may start earlier or later than this age depending on the refractive state of the patients' eyes, their visual needs, and depth of focus among other variables.[2] There is recession of the proximal point of clear vision in presbyopia, and this blurs near vision.[2] People are defined to have presbyopia if they are unable to read the N8 optotype with distance correction in place if needed, or they are able to read at least one more line with the addition of a plus lens.[1,2] The symptoms of presbyopia include difficulty doing near work such as reading (with holding of a reading material progressively further away from the eye in order to be able to focus), sewing, sorting grains and so on which may be associated with headache and eye strain, virtually everyone needs optical aids for reading or other activities that require near visual acuity. Use of spectacles is a cost-effective option for treatment of presbyopia in low- and middle-

income countries though new treatment options are available.[1] Presbyopia was estimated to affect 1.8 billion people globally in 2015, with more than third unable to access the necessary refractive correction to overcome the associated vision impairment (VI).[2] This study was conducted to determine the prevalence of presbyopia in a university environment, where performance is largely dependent on constant reading.

METHOD

The University Health Services is located in Jos North local government area of Plateau state in North central Nigeria and provide health care for students, academic and nonacademic staffs of the university and their relations and also outsiders. All new and old patients aged 35 years and above who visited the eye clinic during the study period were included. Demographic details and ocular examination findings as well as refraction results of all eligible participants were obtained from the patients' case notes. Presbyopia was defined as the inability to read the N8 optotype with distance correction in place if needed, or the ability to read at least one more line with the addition of a plus lens. Other information obtained from the patients' case note included information on where the patient's spectacle was obtained from for those that

were using spectacle and the reason for not obtaining spectacle among those who were not using spectacle. Minor eye conditions of patients seen during the study period were treated and other conditions that may need ancillary tests and other management were referred to Jos University Teaching Hospital, Lamingo Jos. Those patients who could not keep to the appointment of their refraction as seen in the case note were excluded from the study. The study was approved by the Research Ethics committee of the University of Jos. Data were entered into Microsoft Excel sheet and analyzed using SPSS version 22. Categorical variables were compared using Chi-square test, $P < 0.05\%$ was considered as statistically significant.

RESULTS

Of the 203 patients seen during the study period, 191 persons were eligible and included in the study. Twelve eligible patients were not able to keep their refraction appointment and so were excluded, hence a participation rate of 94.1%. The mean age (standard deviation) of the study participants was 50 (± 9.63) years with an age range of 35-70 years. Most of the patients were in the age group of 35-44 years. Ninety-eight (51.3%) persons were females and ninety-three (48.7%) persons were males with a female to male ratio of 1.1:1. Demographic characteristic of participants is shown in Table 1. A little over half of the patients were females as seen in Table 2. Majority of the

patients were staffs 144(75.4%) followed by students 43 (22.5%) Table 3. One hundred and twenty-seven patients were found to have presbyopia and hence a prevalence of 66.5%. Of the one hundred and twenty-seven patients with presbyopia, 70(55.1%) were females and 57(44.9%) were males. The number of patients with presbyopia increased with increasing age but reduced after the age of 54 years. The prevalence is higher in Emmetropes (68.5%) and hyperopes (15.0%) Table 4. Presbyopia correction among the patients ranged from +1.00 diopter sphere (DS) to +3.50DS Table 5.

The mean dioptric add required to read N5 increased significantly with age (chi square 229.0.1, p value 0.000). Two third (84; 66.1%) of the 127 subjects with presbyopia were using spectacles. Thirty-six (42.9%) of the 84 subjects with presbyopia who were using spectacles stated that they had been prescribed spectacles to see near objects clearly as well as to address their difficulty reading small prints. Thirty (23.6%) of the 127 subjects with presbyopia had used spectacle before but were not using them because they were not comfortable and not seeing with the spectacles. Majority of the patients got their spectacle during an outreach and from the market. Of the 13 patients who had never used spectacle before, costs and need not felt were the major reasons cited for not using the spectacle. Table 6 shows the association between presbyopia and some demographic factors with a positive odd ratio in which the association is only statistically significant with occupation at a p value of 0.001.

Table 1: Age distribution of study participants

Age Category (years)	Frequency	Percentage
35-44	62	32.5
45-54	60	31.4
55-64	53	27.7
65-74	16	8.4
Total	191	100

Table 2: Gender distribution of study participants

Gender	Frequency	Percentage
Male	93	48.7
Female	98	51.3
Total	191	100

Table 3: Distribution of study participants according to occupation

Occupation	Frequency	Percentage
Staff	144	75.4
Students	43	22.5
Outsider	4	2.1
Total	191	100

Table 4: Refractive status of participants with presbyopia

Refractive Status	Frequency	Percentage
Emmetropia	876	8.5
Hypermetropia	191	5.0
Myopia	16	12.6
Astigmatism	4	3.1
Anisometropia	1	0.8
Total	127	100

Table 5: Refractive status and presbyopic add of study participants

Refractive Status	Addition in Dioptre N(%)				Total
	1.00-1.50	1.75-2.25	2.50-3.00	>3.00	
Emmetropia	38(82.6)	22(66.7)	27(57.4)	0	87(68.5)
Hypermetropia	2(2.2)	4(12.1)	13(27.7)	1(100.0)	19(15.0)
Myopia	5(10.8)	4(12.1)	7(14.9)	0	16(12.6)
Astigmatism	1(2.2)	3(9.1)	0	0	4(3.1)
Anisometropia	1(2.2)	0	0	0	1(0.8)
Total	46(100)	33(100)	47(100)	1(100)	127(100)

Table 6: Logistic regression to determine the factors associated with presbyopia

Factor	Odds ratio	p value
Age	0.998	0.988
Sex	0.568	0.089
Occupation	2.217	0.001*

DISCUSSION

Majority of the patients were between 35 and 64 years of age, a productive age group where presbyopia is high and where the most desired reading correction is required. The high prevalence of presbyopia (66.5%) found in this study is similar to that found in previous studies.[1,3-8] The high prevalence in our study could be because the study was conducted in an academic environment where performance depends on visual function precisely near vision. Lower prevalence of presbyopia was however found in previous studies.[9-12] The reason for such lower prevalence could be due to different study definition, younger study participants and probably due to lower number of females who are known to have a higher prevalence of presbyopia. The age at diagnosis of presbyopia is 37 years in this study and it was also found that the reading correction obtained for those in the age group of 35-44 years was from 1.00DS to 1.50DS, which agrees with the fact that Africans had an earlier age of onset.[1,5] This might be due to environmental factors as people in the tropics were found to have early age of onset of presbyopia. This contrast study done among Caucasian, where it was found that the onset of presbyopia was in the mid-40s.[13] The prevalence of presbyopia was found to increase with increasing age but reduces from the age of 55 years which may probably be due to the fact that patients over the age of 55 years mostly staffs have either retired or approach retirement age and this may reduce the actual number of patients with presbyopia at that age. It was found that there were more females than males in the study cohort, so also more females were found to have presbyopia. Similar findings were observed in other studies. [1,10,13-14] Contrary result was found by Ejimade *et al* where male preponderance in the prevalence of presbyopia was observed.[15] The reason for this difference in gender preponderance needs further investigation but could probably be due to the fact that women are less likely to be able to afford correction and also are less likely to know where to get spectacle. Similar result was found in previous studies.[16-18] Presbyopia was found to be commoner among those with hypermetropia than myopia and astigmatism. This agrees with the fact that hypermetropia increased with age from 45 years and above where the most presbyopic correction would be required. Similar finding of Ayanniyi *et al* [19] observed that more than half of the participants were found to be using spectacle. This could be because majority of the participants were educated as they were staffs and students of a tertiary institution. Cost was found to be the major barrier to the uptake of spectacle among the participants who have never use glasses in the past.

A limitation of this study was that some participants did not used their real age during their documentation as a new staff or student because of some personal benefit as such this would likely have affected the age at diagnosis of presbyopia and the presbyopic add correction.

CONCLUSION

Presbyopia was found to be a significant problem in among the study participant. There is therefore need to improve on refractive services in the University environment as this would improve the quality of services rendered by university staffs as well as improving the academic performance of the university students and this would

promote a positive attitude toward eye health thereby reducing the burden of uncorrected presbyopia.

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