

Pattern of refractive errors among the patients presenting to eye department of district hospital of Uttarakhand

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Abstract

Introduction: Refractive errors are the most common eye disorder encountered in eye OPD of any region worldwide. Global estimates indicate that more than 2.3 billion people in the world suffer from poor vision due to refractive error (RE), this study was conducted to see the pattern of refractive errors in patients of district hospital, which serves most of the population of hilly region of Garhwal, Uttarakhand.

Material and Methods: The present hospital based prospective study was conducted in the department of ophthalmology, district hospital Dehradun. All patients from the age of 5 and above attending the eye OPD were taken for the study for the period of 2 months from 25 April'16 to 24 June'16. They were referred for refraction after proper anterior and posterior segment evaluation. Presbyopia was not analysed in our study.

Results: During the study period 1986 patients attended the eye OPD. Out of which 259 (13.04%) had refractive error. Out of which 98 were male (37.84%) and 161 were female (62.16%), age of the patients varied from 5 to 65 years with a mean age of 31.89 years. Among them 93 (35.91%) had myopia, 73 (28.19%) had hypermetropia, 49 (18.92%) had ATR astigmatism, 25 (9.65%) had with the rule astigmatism, 19 (7.33%) had oblique astigmatism.

Discussion: Refractive errors are important cause of visual impairment in developing countries, specially in remote areas, it is very difficult to provide efficient refraction services. Among the refractive errors, myopia was the commonest, constituting 35.91% of all refractive errors. Followed by hypermetropia 28.19%, ATR astigmatism 18.92%, WTR astigmatism 9.64%, oblique astigmatism 7.34%. It was seen that prevalence of myopia is more in younger age group of 15 to 24 years as compared to hypermetropia, which is increasing with age, with peak at 46 to 55 years. It was seen that hypermetropia was also more common among women ($p < 0.05$). According to a study by Prema et al, which was conducted in Tamil Nadu, Hyperopia was commoner among women than men ($p = 0.001$); was positively associated with diabetes mellitus ($p = 0.008$) in the rural population. In our study it was seen that ATR astigmatism was found more common than WTR astigmatism ($p = 0.00262$). WTR astigmatism was more in 5-15 years age group. ATR astigmatism was more seen in 26-45 years of age group.

Conclusion: Refractive errors are common eye conditions, which can be easily corrected with appropriate spectacles. Myopia is more common in younger population while hypermetropia is more common in older age groups.

Keywords: ATR (against the rule), Astigmatism Refractive error (RE), WTR (with the rule), Myopia, Hypermetropia

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Introduction

Refractive errors are the most common eye disorder encountered in eye OPD of any region worldwide. Global estimates indicate that more than 2.3 billion people in the world suffer from poor vision due to refractive error (RE)¹. Current data suggests that more than 90% of people with uncorrected RE, worldwide, reside in rural and low-income countries². So WHO has kept the correction of refractive error as one of the priority in Vision 2020, right to sight.

The prevalence of blindness due to refractive error in an Indian population was reported to be 0.36%, including 0.06% from amblyopia resulting from high uncorrected refractive error³, evidence suggests that

blindness due to uncorrected or under corrected high refractive error is a significant problem in developing and developed countries.^{4,6}

Uttarakhand is one of the state of India where most of the population resides in hilly region with lesser exposure to health services. People faces lots of hurdles for reaching health care facilities as they have to walk for hours to reach road heads.

In this article we are focusing on the pattern of refractive errors in patients of district hospital, which serves most of the population of hilly region of Garhwal, Uttarakhand.

Material and Methods

The present hospital based prospective study was conducted in the department of ophthalmology, district hospital Dehradun. All patients from the age of 5 and above attending the eye OPD were taken for the study for the period of 2 months from 25 April'16 to 24 June'16. They were referred for refraction after proper anterior and posterior segment evaluation. Presbyopia was not analysed in our study. Children less than 5

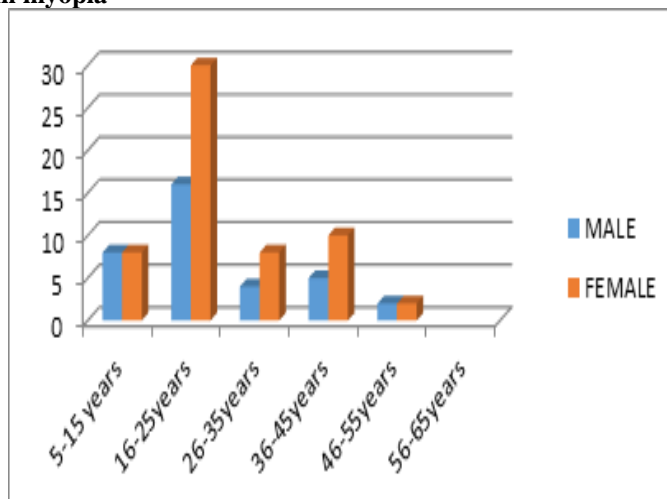
years of age and patients with other ocular diseases causing decreased visual acuity were not taken in the study. Patients who had RE of at least 0.50 D were taken for study. Myopic astigmatism at $180^{\circ} \pm 15^{\circ}$ or hypermetropic astigmatism at $90^{\circ} \pm 15^{\circ}$ were taken as with the rule (WTR) astigmatism and myopic astigmatism at $90^{\circ} \pm 15^{\circ}$ or hypermetropic astigmatism at $180^{\circ} \pm 15^{\circ}$ were taken as against the rule (ATR) astigmatism. A stigmatism of $>15^{\circ}$ to $<75^{\circ}$ or $>105^{\circ}$ to $<165^{\circ}$ was considered as oblique astigmatism.

Results

During the study period 1986 patients attended the eye OPD. Out of which 259 (13.04%) had refractive error. out of which 98 were male (37.84%) and 161 were female (62.16%), age of the patients varied from 5 to 65 years with a mean age of 31.89 years. Among them 93 (35.91%) had myopia, 73 (28.19%) had hypermetropia, 49 (18.92%) had ATR astigmatism, 25 (9.65%) had with the rule astigmatism, 19 (7.33%) had oblique astigmatism.

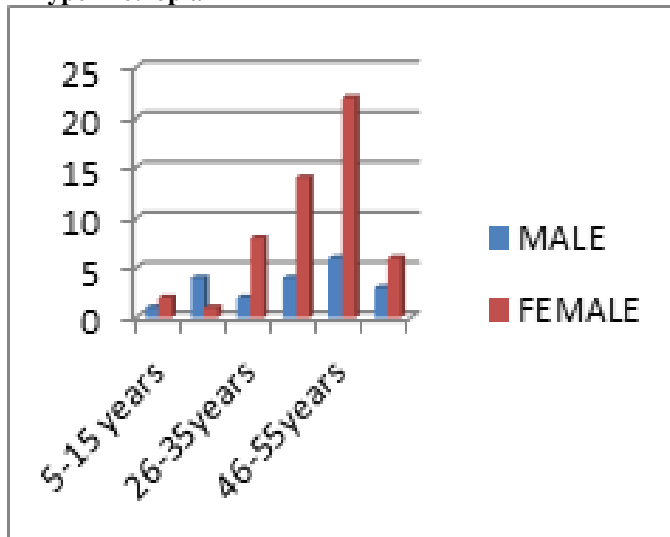
Age (in years)	Myopia		Hypermetropia		ATR Astigmatism		WTR Astigmatism		O Blique Astigmatism	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
5-15	8	8	1	2	2	1	8	6	0	2
16-25	16	30	4	1	2	2	3	2	4	4
26-35	4	8	2	8	4	10	2	2	2	3
36-45	5	10	4	14	4	8	0	2	0	2
46-55	2	2	6	22	8	2	0	0	0	2
56-65			3	6	4	2	0	0	0	0
Total	35	58	20	53	24	25	13	12	6	13

Age and sex distribution in myopia



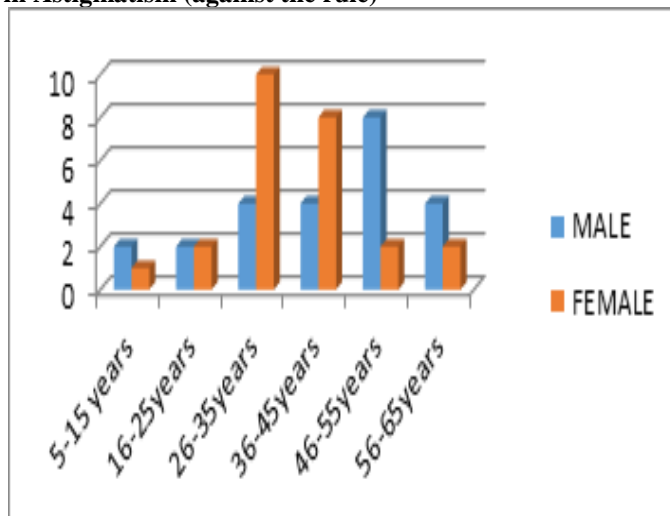
Myopia was the commonest RE (35.91%) type, which showed a peak in the younger age group of 15-24 years.

Age and sex distribution in hypermetropia

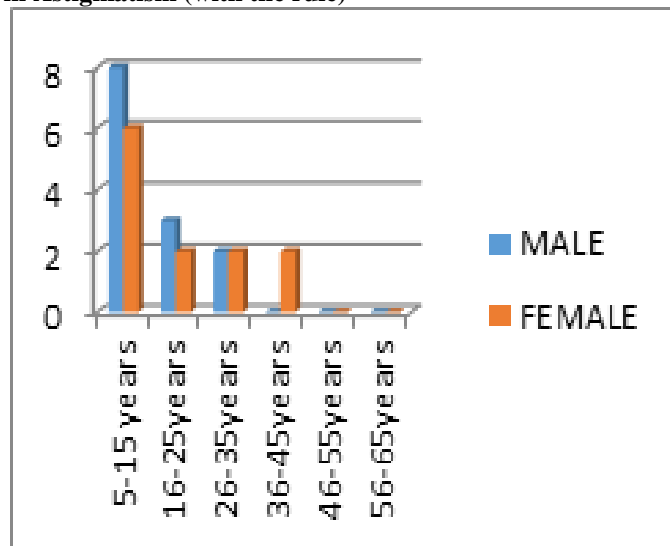


Hypermetropia was seen in 28.19% of cases. It was more common in age group of 46-55 years.

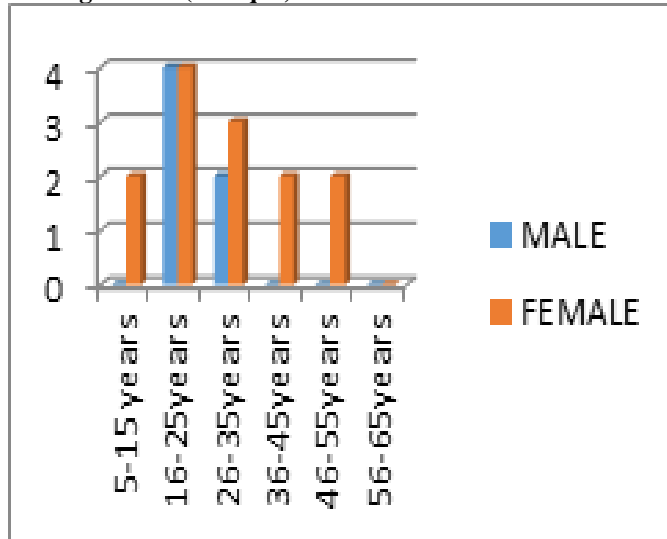
Age and sex distribution in Astigmatism (against the rule)



Age and sex distribution in Astigmatism (with the rule)



Age and sex distribution in Astigmatism (Oblique)



Distribution of all refractive errors according to age

Refractive Error	≤/ <35 Years of age			>35 Years of age			P value for comparing RE between male & females(z score)
	Male	Female	Total	Male	Female	Total	
Myopia	28(28.57%)	46(28.57%)	74(79.97%)	7(7.14%)	12(7.45%)	19(20.43%)	0.96
Hypermetropia	7(7.14%)	11(6.83%)	18(24.65%)	13(13.27%)	42(26.08%)	55(75.35%)	.03(more common in females)
ATR Astigmatism	8(8.16%)	13(8.07%)	21(42.86%)	16(16.33%)	12(7.45%)	28(57.14%)	0.07
WTR Astigmatism	13(13.27%)	10(6.21%)	23(92%)	0	2(1.24%)	2(8%)	0.12
Oblique Astigmatism	6(6.12%)	9(5.59%)	15(78.95%)	0	4(2.48%)	4(21.05%)	0.56
Total	62	89	151	36	72	108	

On statistical analysis by Z score method the prevalence of all refractive errors were similar in males and females except hypermetropia which was found more common among females.

Type of Refractive Error	Age <35 yrs	Age >35 yrs	P value for comparing age
Myopia	74	19	P<0.05
Hypermetropia	18	55	P<0.05
ATR Astigmatism	21	28	P<0.05
WTR Astigmatism	23	2	0.0003
Oblique Astigmatism	15	4	0.057
Total	151	108	

By Z score test it was seen that myopia was more common in younger age group and hypermetropia was more common after 35 years of age. ATR astigmatism was more seen after 35 years of age and WTR was more common in younger age group. The prevalence of oblique astigmatism was similar in both groups. ATR astigmatism was found more common than WTR astigmatism(p=0.00262)

Discussion

Refractive errors are important cause of visual impairment in developing countries, specially in remote

areas, it is very difficult to provide efficient refraction services. In these areas, females are specially remains underprivileged of the services. But in our study the number of females were markedly high. This may be due to better availability of transport services in hilly areas than before. It also shows that females are not prevented from taking health services. It may also be due to the fact that the study was conducted during the summer vacation time and most of the schools have necessitated the medical fitness certificate before admission. So the mothers came with the child and also got the time to check themselves.

Among the refractive errors, myopia was the commonest, constituting 35.91% of all refractive errors followed by hypermetropia 28.19%, ATR astigmatism 18.92%, WTR astigmatism 9.64%, oblique astigmatism 7.34%.

Shrestha et al did a study to see the Pattern of refractive errors among the Nepalese population, they found Myopia as commonest (36.1 %) type of refractive error followed by hypermetropia (31.6 %).⁷

It was seen that prevalence of myopia is more in younger age group of 15 to 24 years as compared to hypermetropia, which is increasing with age, with peak at 46 to 55 years. It was seen that hypermetropia was also more common among women ($p < 0.05$). According to a study by Prema et al, which was conducted in Tamil Nadu, Hyperopia was commoner among women than men ($p = 0.001$); was positively associated with diabetes mellitus ($p = 0.008$) in the rural population.⁸

In our study it was seen that ATR astigmatism was found more common than WTR astigmatism ($p = 0.00262$). WTR astigmatism was more in 5-15 years age group. ATR astigmatism was more seen in 26-45 years of age group.

A study conducted in Northeast Iran found that ATR astigmatism was the most frequent among the participants and that the prevalence of this type of astigmatism significantly increased with age.⁹

Our study was a hospital based study, so it cannot be applied over the normal population also the sample size was small, so more studies are required with a larger sample size to show the pattern of refractive errors in Uttarakhand.

Conclusion

Refractive errors are common eye conditions, which can be easily corrected with appropriate spectacles. Myopia is more common in younger population while hypermetropia is more common in older age groups.

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