



Refractive errors among patients attending the ophthalmology department of a tertiary hospital in Mid-Western Nepal

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Abstract

Introduction: Uncorrected errors of refraction are the largest cause of impaired vision and blindness worldwide. If these errors of refraction are not identified on time they might lead to decreased productivity and diminution of physical quality of life as well. So, this study was done to assess the magnitude and pattern of refractive error among patients attending the OPD of the newly established ophthalmology department of the tertiary hospital in mid-western part of Nepal.

Materials and Methods: A Prospective cross-sectional study including all patients more than 5yrs of age attending the OPD of the ophthalmology department with unaided V/A less than 20/20 but improved with pin hole between 1st October - 30th December 2021 was conducted. All patients except pseudophakia, aphakic and patients suffering from any ocular diseases were excluded.

Result: Out of total 528 patients with refractive error, three hundred twenty (61.6%) were female and 238(38.4%) patients were of male. Age of patients ranged from 5 years till 76 years with mean age being 34.08 with standard deviation 16.6. 202 (38.3%) patients between age group 20-39 years had maximum incident of refractive error followed by 148 (28%) in age group 40-59 years.

Conclusion: This study concludes that in a OPD setting of a tertiary care hospital the most common pattern of refractive error in general population was found to be myopia.

Keywords: myopia, hypermetropia, refractive error

Introduction

Refractive error is a defect in the optical system of the eye which prevents light from being brought to a single point focus on the retina, thus reducing normal vision [1]. Uncorrected refractive errors are the leading cause of preventable blindness accounting for 42% according to global estimates of Visual impairment 2010 [2]. Prevalence observed in recent study in the US was 22.7% and in Australia the overall prevalence of Myopia was 17% [3] and 18.4% reported in Israel [4]. The prevalence of blindness due to refractive error in an Indian population was reported to be 0.36% and evidence also suggest blindness due to uncorrected high refractive error is a significant problem in developing as well as developed countries [5-7].

Refractive error falls under cause of preventable blindness which can be corrected by using spectacles, contact lens and the treatment is simple yet successful.

As refractive error is major cause of visual impairment, this study aims at giving knowledge of prevalence of refractive errors in a tertiary care hospital of mid-western Nepal which in future could be helpful in planning various public health strategies.

Materials and Methods

The present study is a prospective cross-sectional study conducted in eye department of RAHS situated Ghorahi of Dang district in mid- western part of Nepal. Patients who

attended the ophthalmology department from till 1st October till 30th December 2021 with age more the 5yrs old and visual acuity less than 6/6 in one or both eyes, but improved with pin hole was selected for the study. Assessment of visual acuity with standard illuminated snellens visual acuity chart or e-chart for illiterate patients was done. Refraction was done manually with streak retinoscope by a trained optometrist. Cycloplegic refraction was done where required. Proper anterior and posterior segment examination was done to rule out pseudo phakic, aphakic or any organic lesion in either anterior or posterior segment of eye.

Data collection and analysis

The data including patients' epidemiological profile was entered in excel sheet and analyzed using spss 28.

Result

Out of total 528 patients with refractive error, three hundred twenty (61.6%) were female and 238(38.4%) patients were of male gender. Age of patients ranged from 5 years till 76 years with mean age being 34.08 with standard deviation 16.6. 202 (38.3%) patients were between age group 20-39 years had maximum incident of refractive error followed by 148 (28%) in age group 40-59 had refractive error. The most common type of refractive error was found to be simple myopia (42.4%) and simple hypermetropia in 138 (26.1%). Myopic astigmatism in 163 (30.9%). and hypermetropic astigmatism in 37(7%).

Followed by mixed astigmatism in 10 (1.9%).

Table 1: The age and gender distribution of the patients

Age	Male	Female	Total
5-19	64(12.1%)	64(12.1%)	128 (24.2%)
20-39	63(11.9%)	139 (26.3%)	202 (38.3%)
40-59	50 (9.5%)	98 (18.6%)	148 (28%)
60 and above	26 (4.9%)	24 (4.5%)	50 (9.5%)
Total	203 (38.4%)	325 (61.6%)	528

Data are the numbers of patients (percentages of the total group)

Table 2: Distribution of different types of refractive errors in different age groups

Age Groups	Simple	Myopic Astigmatism	Hypermetropia	Hypermetropic Astigmatism	Mixed Astigmatism
5-19	85 (16.1%)	39 (7.4%)	5 (0.9%)	1 (0.2%)	1 (0.2%)
20-39	98 (18.6%)	96 (18.2%)	6 (1.1)	4 (0.8%)	3 (0.6%)
40-59	28 (5.3%)	26 (4.9%)	96 (18.2%)	22 (4.2%)	3 (0.6%)
60 and above	13 (2.5%)	2 (0.4%)	31 (5.1%)	10 (1.9%)	3 (0.6%)
Total	224 (42.4%)	163(0.9%)	138 (6.1%)	37(7%)	10 (1.9%)

Table 3: Age Groups* Sex Cross tabulation

		Sex		Total	
		Male	Female		
Age Groups	5-19	Count	64	64	128
		% Of Total	12.1%	12.1%	24.2%
	20-39	Count	63	139	202
		% Of Total	11.9%	26.3%	38.3%
	40-59	Count	50	98	148
		% Of Total	9.5%	18.6%	28.0%
	60-90	Count	26	24	50
		% Of Total	4.9%	4.5%	9.5%
Total		Count	203	325	528
		% Of Total	38.4%	61.6%	100.0%

Table 4: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	528	5	76	34.08	16.576
Valid N (list wise)	528				
Sex					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	203	38.4	38.4	38.4
	Female	325	61.6	61.6	100.0
	Total	528	100.0	100.0	

Out of 528, Two Hundred and three (38.4%) patients were male and Three Hundred and twenty-five (61.6%) were female. The age of patients ranged from 5 to 76 with the mean being 34.08 and standard deviation 16.6.

Table 5: Statistics the mean age and standard deviation

		Sex	Male	Female
Male	N	Valid	203	203
		Missing	0	0
	Mean		33.9310	33.0148
	Std. Deviation		18.11201	14.56820
Female	N	Valid	0	122
		Missing	325	203
	Mean			36.0902
	Std. Deviation			16.99198

The mean age and standard deviation of Male patients: 33.9 and 18.1 and Female patients: 36.1 and 16.9

Discussion

In Developing Countries like ours it is very difficult to Provide efficient Eye Care Service so as to diagnose refractive errors. The prevalence of refractive error varies in different parts all over of the world. Prevalence of refractive error ranges form 2.2-18.8% among different studies. In India according to murthy GV *et al* [8] 15.15% and 18.8% in China by a study by Zhao J *et al* [9]. The pattern of refractive error differs according to age and gender as well.

In our study the most common age group having refractive error was 20-39 years which in the most productive age group followed by 40-59 years of age. In A study by Tuladhar S [10] done in pokhara majority of patients were in the age group 11-20 years. In a study done by Tanie Natung et sl [11] had the most common age group for refractive error was found to be 40-59 years, followed by 20-39 years.

In our study, 325 (61.6%) females had refractive error a compared to 203 (38.4%) of male patients showing our OPD Patient have female preponderance. Similar result was found in a study done in North East India [11] showing (59.5%) females and 40.5% males.

Similar result as our study in by a study bharadwaj *et al* [12] there were 62.16% female as compared to 37.84% male with refractive error showing it is more prevalent in female gender. Regarding the type of refractive error, myopia has been the most common type of refractive error in most studies. In this study also 24.4% patients had simple myopia with 30.9% having myopic astigmatism and just 26.1% having simple hypermetropia and only 1.9% having mixed astigmatism.

Similarly, myopia was more prevalent in 20-39 years age group followed by 5-19 years and just 2.9% in 60 years and above and the most common age for prevalence of hypermetropic was between 40-59 years showing progressive increase in age leads to hypermetropic type of refractive error.

The study by Tuladhar S [10] conducted in Pokhara and a study by Shrestha *et al* [13] to see the pattern of refractive errors among the Nepalese Population also found myopia to be the commonest type of refractive error.

In a study by Bharadwaj *et al* [12] also myopia was more common in younger age group 15-24 years, as compared to hypermetropia which is increasing with age and peak at 46-55

years. A study conducted in Tamil done by Prema *et al* ^[14] found the hypermetropia was commoner among women than men and was positively associated with diabetes mellitus ($p=0.08$) in the rural population.

Conclusion

So, we can conclude that myopia is commonest type of refractive error and refractive errors were common eye condition and timely intervention can save sight. At present as the study was hospital based only, so we suggest real time surveys and larger population-based studies so as to estimate the correct picture.

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