

REFRACTIVE ERRORS IN ADULTS STUDIED AT A TEACHING HOSPITAL

Hidayatullah Mahsud¹, Muhammad Irfan Wazir¹, Muhammad Wali Saleem², Mirqad Ayaz¹

¹Department of Ophthalmology, DHQ Teaching Hospital, Bannu, Pakistan

²Khyber Medical College, Peshawar, Pakistan

ABSTRACT

Background: Refractive errors are one of the commonest causes of visual impairment and disability. The aim of this study was to evaluate the distribution of different types of refractive errors.

Material & Methods: This descriptive prospective study including one thousand and eighty seven patients was conducted at outpatient department of Ophthalmology, DHQ Teaching Hospital, Bannu, from October 2014 to March 2015. Refraction was done with Neitz streak retinoscope and Topcon auto-refractometer.

Results: Among 1087 patients studied, 739(67.98%) were males and 348(32.02%) females. Age range was 25 to 80 years with a mean of 45.1. Refractive errors ranged from -14D to +10D. Myopia was the commonest refractive error found in 479(44.06%) patients, hyperopia in 286 (26.31%) and astigmatism in 307(28.20%) patients.

Conclusion: Refractive errors are among the major causes of visual impairment, disability and blindness. However refractive errors are easily correctable. Effective measures should be taken for screening and refraction to combat the avoidable visual impairment and disability due to refractive errors.

KEY WORDS: Refractive errors; Adults; Myopia; Hyperopia; Astigmatism; Anisometropia.

This article may be cited as: Mahsud H, Wazir MI, Saleem MW, Ayaz M. Refractive errors in adults studied at a teaching hospital. *Gomal J Med Sci* 2015; 13: 223-5.

INTRODUCTION

Refractive errors are one of the major causes of visual impairment and disability, which can be judged from the fact that about 2.3 billions people have refractive errors globally.¹ Out of 314 million people with visual disability i.e. visual acuity less than 6/18) refractive errors (RE) account for 153 million cases.² The national survey on prevalence of blindness and its causes revealed that visual disability caused by RE in Pakistan is as much as that caused by cataract.³ RE are responsible for approximately half of global visual impairment and set as one of the priorities in the initiative "VISION 2020"- the Right to Sight.⁴

Myopia is that refractive error in which the light is brought to a focus in front of the retina, while in hyperopia it is brought to a focus behind the retina. In

both conditions, the refractive power of the refractive media is the same in all meridians. Concave and convex lenses are used to diverge and converge light to bring the rays of light exactly on the retina in myopia and hyperopia respectively. In astigmatism, the refractive power is not the same in all meridians as a consequence of difference in curvature of refractive media (cornea and lens) in different meridians. Anisometropia is the optical condition in which there is a difference in the refractive power of the two eyes of the same patient. The aim of this study was to evaluate the distribution of different types of refractive errors.

MATERIAL AND METHODS

This descriptive prospective study was conducted at outpatient department of Ophthalmology, DHQ Teaching Hospital, Bannu, from October 2014 to March 2015. It included one thousand and eighty seven adult patients. Patients with diseases like dense cataracts, advanced glaucoma, advanced corneal degeneration/dystrophies, retinal detachment, vitreous hemorrhage in which refraction was not possible and previous history of surgery were excluded from this study. All patients underwent complete

Corresponding Author:

Dr. Hidayatullah Mahsud
Assistant Professor
Department of Ophthalmology
Bannu Medical College
Bannu, Pakistan
E-mail: mahsud_hu@yahoo.com

Table 1: Showing types and distribution of refractive errors.

Myopia	Total 479 cases (44.06%)	Mild to moderate myopia 466 cases (97.2%)	High myopia 12 cases (2.5%)	Extreme high myopia 1 case (0.2%)
Hyperopia	Total 286 cases (26.31%)	Low hyperopia 231 cases (80.7%)	High hyperopia 55 cases (19.2%)	—
Astigmatism	Total 307 cases (28.7%)	Simple astigmatism 112 cases (36.4%)	Compound astigmatism 170 cases (55.3%)	Mixed astigmatism 25 cases (8.1%)
Anisometropia	Total 15 cases (1.3%)	—	—	—
Visually disabling RE	Total 384 cases (35.3%)	—	—	—

examination of both anterior and posterior segments including pupillary examination, ocular motility, and cover-uncover tests, slit lamp examination, direct ophthalmoscopy and slit lamp bicroscopy. Visual acuity (VA) was recorded with Snellen's chart and Near vision chart. VA was measured both unaided and with glasses in patients already using spectacle. All patients with VA less than 6/6 were refracted with Neitz retinoscope and Topcon auto-refractometer.

RESULTS

Among 1087 patients, 739 (67.98%) were males and 348 (32.02%) were females. Age range was from 25 to 80 years, with a mean of 45.1 years. Myopia ranging from -0.5D to -14D and the most common RE founded, included 479 cases (44.06%). In 466 cases (97.2%), mild to moderate myopia (less than -5D), in 12 cases (2.5%), high myopia (-5D to -10D) and in 1 case (0.2%) extreme high myopia (> -10 D) was detected respectively.

Hyperopia ranging from +1 D to +10 D included 286 (26.31%) patients. In 231 patients (80.7%) low hyperopia and in 55 patients (19.2%) high hyperopia was found respectively. Similarly astigmatism ranging from 0.5 DC to 4.5 DC was recorded in 307 (28.20%) patients. 112 (36.4%) patients had simple astigmatism, 170 (55.3%) compound astigmatism and 25 patients (8.1%) had mixed astigmatism respectively. Anisometropia was detected in 15 cases (1.3%).

VA ranged from 6/9 to 6/18 in 703 patients (64.6%), from 6/24 to 6/60 in 312 cases (28.7%) and less than 6/60 in 72 patients (6.6%) respectively. 384 patients (35.3%) had visually disabling refractive errors i.e. VA less than 6/18. In 52 cases (4.7%) no further improvement occurred with refraction which can be attributed to high degrees of cataract,

anisometropia, strabismus, high degree of refractive errors, macolopathy, etc.

DISCUSSION

Refractive errors are the leading cause of visual impairment and disability in Pakistan.³ The prevalence of visually disabling refractive errors in Pakistan in overall population is 4%.⁶ About half of cases of visual impairment worldwide are the consequence of uncorrected refractive errors.^{7,8} There are still 500 million people with blindness and visual impairment due to uncorrected refractive errors.¹ About one third of the population aged 40 years and above in United States and one fifth of Australians is having refractive errors.⁸

Our study showed myopia to be the commonest refractive error. Results of National blindness and visual impairment survey reported myopia to be the commonest refractive error in Pakistan with a crude prevalence of 36.5%.⁹ Our study also shows myopia as the commonest refractive error and accounting for 44.06% of all refractive error. Similarly Qureshi et al also reported myopia to constitute the major portion of refractive errors, accounting for 57.8%.¹⁰ While Abdullah et al has reported hyperopia as the commonest refractive error.¹¹ Kempen et al⁸, Wolfram et al¹², Gupta et al¹³, Borne et al¹⁴, Dandona et al¹⁵, Wong et al¹⁶ and Saw et al also reported myopia as the commonest refractive error.¹⁷

In our study hyperopia was found in 26.31% patients and astigmatism in 28.7% of the patients. Qureshi et al reported hyperopia in 18.7% and astigmatism in 21.3% of the patients. Shah SP et al reported hyperopia in 21.7% patients. Similarly Abdullah et al reported hyperopia in 46.73%, myopia in 27.64% and astigmatism in 25.63% of the patients respectively. The anisometropia reported by Qureshi

et al and Wolfram et al was 1.1% and 13.5% respectively, while in our study it was detected in 1.3% of the patients.

CONCLUSION

Refractive errors are among the major causes of visual impairment, disability and blindness. However refractive errors are easily correctable. Effective measures should be taken for screening and refraction to combat the avoidable visual impairment and disability due to refractive errors.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.