DOI: https://doi.org/10.53350/pjmhs2115113146

ORIGINAL ARTICLE

Prevalence of First Birth Order with Myopia Among KPK Population

SYEDA GULRUKH SABA SHAH[1], MUTAYYABA MAJEED[2], SHAMS-UL-HAQ[3], FARHANA JABEEN SHAH[4], WAQAS ALI[5]
[1]Assistant Professor of Anatomy/Coordinator, Department of Medical Education,
[2]Senior Demonstrator, Department of Physiology, Independent Medical College, Faisalabad
[3]Senior Lecturer,
[4]Associate Professor, Department of Community Medicine, Department of Community Medicine, Gandhara University, Kabir Medical College Peshawar
[5]Lecturer, Department of Anatomy, Nowshera Medical College, Nowshera
Correspondence to: Waqas Ali, E-mail: drwaqasali123@gmail.com, Cell: 0336-9678030

ABSTRACT

Objective: To find out the prevalence of myopia and hyperopia among the population of KPK.
Study Designed: Cross-sectional analytical study.
Place and duration of Study: OPD of tertiary care hospitals of KPK, Khyber Teaching Hospital and Hayatabad Medical Complex from 1st July 2020 to 30th June 2021.
Methodology: Four hundred patients visiting to OPD of tertiary care hospitals of KPK, Khyber Teaching Hospital and Hayatabad Medical Complex, Peshawar were enrolled. Both male and female were included from 17 to 24 years visiting to the hospital were included. All patients on any medication for any systemic illness like asthma, TB, cardiac issues, liver problems etc. patients suffering from eye disorders like glaucoma, cataract, diabetic retinopathy, uveitis etc. and patients who refused to give consent and uncooperative patients were excluded from the study.
Results: Two hundred and seventy seven got normal eye structure, function and vision while 123 got abnormal eye vision, with the frequency of myopia 26.5% (106) while hyperopia was 4.3% (17). Among gender the refractive errors of an eye was found to be 25% in male while 35.5% in female pvalue-0.024. The frequency of refractive error was not significant in age 17, 18, 23 and 24years the refractive error was found to be less as compare to age 19-22 years the refractive errors were seen to be greater. The patients visiting to hospital for eye examination with abnormal refractive errors were 41.1% while the result was significant p value was 0.0001. Genetically 1st order birth got 40% refractive errors while other got 23.5% the results were significant (P=0.004).
Conclusion: The prevalence of eye defects related to refractive errors was present among adult population of KPK. Age is not related to refractive errors and refractive errors can be genetically determine.
Key words: Myopia, Hyperopia, Refractive errors, Birth order

INTRODUCTION

Emmetropia is defined as lack and absence of refractive error while ametropias is defined as the presence of refractive error in which the light rays don't converge on retina. These defects are further classified into three groups myopia, hyperopia and astigmatism.[1,2] Myopia is the disorder in which parallel light rays converge on focal point before retina. Hyperopia is the defect in which parallel rays of light converge behind the retina[1], while astigmatism is the unevenly curve corneal surface and light rays cannot be focused from altered meridians on the same point on retina.[2]

In eye defects the refractive errors are very common in young and academically active population. Various studies have been done in universities to find out the prevalence of refractive errors among university students.[3] There are three types of refractive errors among three myopia is very common and most prevalent defect of eye. The Advanced stage of myopia is associated with loss of vision, such as retinal detachment ,dense cataract, glaucoma and sub retinal neovascularization.[4] The specific causes of myopia is not known but visual stress and heredity factors are responsible for the development of myopia.[3] A cross-sectional study has done on university students in AIMST university of Malaysia concluded that the most common refractive error was myopia and the prevalence of myopia was high among them[5] because of educational stress so the prevalence was found to be 16-70% in different population. The myopia is further compared among medical student and non-medical students the prevalence among medical students was high as compared to non-medical students because medical students were involved in intensive learning and near work activity. The medical students who were myopic showed myopic progression.[6] Worldwide it is estimated that 2.3billions of individuals are suffering from poor eye vision due to uncorrected refractive errors of an eye, among them 1.8billion have visited for eye check-up, examination of the eye vision and correction. In 2007 there were 158.1 million of cases with visual impairment with uncorrected refractive error among them 8.7 million were blind.[7]

MATERIALS AND METHODS

It was a cross sectional analytical study, sample size was 400 patients visiting to OPD of Tertiary Care Hospitals of KPK, Khyber Teaching Hospital and Hayatabad Medical Complex, Peshawar. Pretesting was done to check the patients understanding and to exclude unnecessary questions from the questionnaire. Both male and female were included from 17 to 24 years visiting to the hospital while exclusion criteria was patient on any medication for any systemic illness like asthma, TB, cardiac issues, liver problems etc. patients suffering from eye disorders like glaucoma, cataract, diabetic retinopathy, uveitis etc and patients who refused to give consent and uncooperative patients were excluded. The study was conducted in Kabir Medical College after ethical approval from the college authorities. All the data was entered and analyzed through SPSS-20.

RESULTS

Table 1: Frequency of prevalence of patients (n=40)

Prevalence	No.	%
Normal	277	69.3
Abnormal	123	30.8

Table 2: Comparison of refractive error according to gender

Gender	Refractive Error		χ^2	P value
	Normal	Abnormal		
Male	135(75%)	45(25%)	5.081	0.024
Female	142(64.5%)	78(35.5%)		

Table 3: Comparison of age with refractive error (n=400)

Age (years)	Refractive Error	
	Normal	Abnormal
17-18	55(13.75%)	19 (4.75%)
19-20	117 (29.25%)	49 (12.25%)
21-22	74 (18.5%)	37 (9.25%)
23-24	31 (7.75%)	18 (4.5%)

69.3% normal while 30.8% were abnormal patients (Table 1).When the refractive error was stratified with gender it showed significant results (P=0.024) [Table 2). Table 3 showed highest values of refractive error with age in 22 years (45.2%) while 23 years (47.1%). Table 4 showed significant P=0.0001) results with eye examination. Table 5 showed significant (P=0.004) results with

birth order in refractive error. Table 6 showed 69.3% normal 26.5% myopic and 4.3% were hyperopic.

Table 4: Comparison of eye examination with refractive error (n=400)

Eye examination	Refractive Error		χ^2	P value
	Normal	Abnormal		
Yes	112(58.9%)	78(41.1%)	18.040	0.0001
No	165(78.6%)	45(21.4%)		
Total	277	123		

Table 5: Comparison of birth order with refractive error (n=400)

Birth order	Refractive Error		χ^2	P value
	Normal	Abnormal		
1st	105 (60%)	70 (40%)	18.040	0.0001
Other	172 (76.5%)	53 (23.%)		
Total	277	123		

Table 6: Frequency of eye defects (n=400)

Eye defects	No.	%
Normal	277	69.3
Myopia	106	26.5
Hyperopia	17	4.3

DISCUSSION

In 1999 and 2004 a survey was conducted on national health and nutrition examination on US population. They used auto refractor to find refractive errors in general population. The objective of the survey was to find out the prevalence of refractor error in civilian population of US age from 12-39 years. The prevalence of the myopia was found to be 33.1% while hyperopia was 3.6%. It was stated in the survey that myopia was more in female 39.9% than in male 32.6% and the result was significant ($p<0.001$).[8]In the present study 400 sample size was used to find out the prevalence of myopia in KPK population from 17 to 24 years. The prevalence of myopia was more 26.5% as compared to hyperopia 4.3% as shown in Table 6. There was more myopia in females 78(35.5%) than in males 45(25%) of age from 17 years to 24 years as shown in Table2. A study conducted in Germany to examine the frequency of refractive errors among adolescent from 12-17 years and adults from 18-35 years in the general population of Germany the prevalence of myopia was 19.7%. In Greek students from 15-18 years was 29% which is lower according to our study the prevalence of myopia was found to be 26.5%. The difference in prevalence may be due to different sample population and age group included in the study. In Germany the study was conducted in general population age from 15-18 years while in our study the sample was taken from the hospitals of KPK and the age was from 17-24 years. The prevalence of myopia was 41.3% in age 18-35 years and 35.0% in age 20-25 years in a population of Denmark. In Europe and Germany the prevalence of moypia was 26.6% while 11.6% were hyeropic which is not in accordance with our study because in our study the age included was from 17-24 years.[9] In Kigali province, Nyarugenge is the second largest district with population of about almost third of the million.[10] This part of district was lacking the expert opthalmologists and eye care worker and personals. We reviewed 634 students age 11 to 37 years with mean age of 17.02 years. There was no difference between refractive errors and gender.[11] Study performed by Wedner et al[12] in Mozambique on young urban students on prevalence of refractive error, in which 53.3% were females while 46.7% were males.

In Pakistan study conducted on prevalence of refractive error in school children of Karachi showed association between female gender and refractive error[13] but there was no association found in ethnicity occupation, age, education and other risk factors.[14] but there were more female 56.6% than male 43.4%.[11]Another study conducted in Pakistan revealed that the prevalence of refractive error varies from 1 to 8%.[13] In the present study there was refractive errors in 35.5% in female and 25% in male but there was no association of myopia with age. There were no apparent changes in development of myopia in all different age groups, education and gender distribution.[12]

The prevalence was decrease as reported in other studieslike prevalence of myopia in teenagers students of high school in Singapore was 21.7% of myopia in Tibetan children.[15,16] In Tanzania,Wedner et al[12] conducted a study on prevalence of refractive errors among students of secondary school of Mwanza was 5.6% and also described myopia as the leading refractive error. In our study the myopia was 26.5% in KPK population age from 17 to 24 years.Across all the studies in Europe there was low myopia in first order birth as compare to others the OR was 1.3 in 4000 participants,in present study there is high myopia among first birth order as compared to others (40%).[18]There was a strong evidence in some of the studies that first born individuals were more myopic as compared to second order and others.19 In the present study higher level of myopia in first birth order was obvious.

The prevalence of hypermetropia was 4.4% while in our study the prevalence was 4.3% while the prevalence of hyperopia in other studies was 0.3% in Bangladesh study conducted by Garneret al[17] and 1% of prevalence of refractive errors in school children of upper-middle socioeconomic status in Kathmandu. Prevalence of this study was similar to that described by the Iranian study equivalent to 5.4% and 4.8% in the study on prevalence of refractive error in young urban students in Mozambique.[18,19] Increase percentages complication in eye vision and refractive errors highlights the importance of educating people for early diagnosis and proper and on time correction of refractive errors.

CONCLUSION

The prevalence of eye defects related to refractive errors was present among adult population of KPK. Age is not related to refractive errors. It is also concluded in the study that refractive errors can be genetically determine.

REFERENCES

1. Duke-Elder S. Erros de refração. In: Duke-Elder S. Refração prática. 10ed. Rio de Janeiro. Rio Méd 1997; 57-77.
2. Alves AA. Emetropias e ametropias. In: Alves AA. Refração. 3ed. Rio de Janeiro: Cultura Médica; 1999; 79-86.
3. Chalasani S, Jampala V.K, Nayak P. Myopia among Medical Students-A Cross Sectional Study in A South Indian Medical College. Al Ameen J Med Sci 2012; 5(3):233-42.
4. Foster PJ, Jiang Y, Epidemiology of myopia. 2014;28(2):202-8.
5. Gopalakrishnan S, Prakash M, Jha R. A study of refractive errors among medical students in AIMST University, Malaysia. Indian med J 2012; 105:365-7.
6. Fesharaki H, Kamali B, Karbasi M, Fasihi M. Development of myopia in medical school. Asian J Ophthalmol 2012; 8(5).
7. Shiferaw Alemu D, Desalegn Gudeta A, Tsega Ferede A, Woretaw Alemu H. Prevalence and degrees of myopia and hyperopia at Gondar University Hospital Tertiary Eye Care and Training Center, Northwest Ethiopia. Clin Optom (Auckl) 2016;8:85-91
8. Vitale S, Ellwein L, Cotch MF, Ferris FL, Sperduto R. Prevalence of Refractive Error in the United States, 1999-2004. Arch Ophthalmol 2008;126(8):1111-9.
9. Jobke S, Kasten E, Vorwerk C. The prevalence rates of refractive errors among children, adolescents, and adults in Germany. Clin Ophthalmol 2008;2(3):601-7.
10. Rwanda demographic profile 2013, Index mundi, Central intelligenceagency. World Fact Book 2017; 8:15-9.
11. Mathenge C, et al. Rapid Assessment of Avoidable Blindness in Western Rwanda: Blindness in a Postconflict Setting, Plos Med2007, 4(7): 217
12. Wedner S, Ross D, et al. Myopia in secondary school students in MwanzaCity, Tanzania: the need for a national screening programme, B JOphthalmol 2002, 86:1200-6.
13. Megbelayin et al. Pattern of refractive astigmatism in Nigerian high schools, Sky J of Med & Med Sci 2013, 1(1): 1-6.
14. Haseeb Alam, M. Irfanullah Siddiqui et al. Prevalence of refractive error in school children of Karachi. JPakMedAssoc2008, 58(322).
15. Liping Li, Yue S, et al. Spectacle acceptance among secondary school students in rural China: The Xichang Pediatric Refractive Error Study, 2008. Invest Ophthalmol Vis Sci 2008, 49(7), 2895-2902
16. Timothy PQ, Choon G, et al. Prevalence of refractive errors in teenage high school students in Singapore, Ophthalmic and Physiological Optics 2004, 24(1), 47-55
17. Garner L, Owens H, et al. Prevalence of myopia in Sherpa and Tibetan children in Nepal. Optom Vis Sci 1999;76:282-5.
18. Guggenheim JA, McMahon G, Northstone K, Mandel Y, Kaiserman I, Stone RA, et al. Birth order and myopia. Ophthalmic Epidemiol 2013;20(6):375-84.
19. Guggenheim JA, Williams C, for the UK Biobank Eye and Vision Consortium. Role of Educational Exposure in the Association Between Myopia and Birth Order.JAMA Ophthalmol2015;133(12):1408-14.