ORIGINAL ARTICLE

Relationship of Myopia with Height in age Group of 12-25 Years

IRAM NISAR[1], SALAH-U-DIN ARBI[2], SHOUKAT BILAL[3], SABA TAUQEER[4]
[1]Optometry & Orthoptics, Department of Ophthalmology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, Pakistan
[2]Professor, Department of Ophthalmology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, Pakistan
[3]Medical Officer, Department of Ophthalmology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, Pakistan
[4]Senior Registrar, Department of Ophthalmology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, Pakistan
Correspondence to: Iram Nisar, Email: iramnisarszmc786@gmail.com, Cell: 0336-6803604

ABSTRACT
Objective: To determine the relationship of myopia with height in young group of age 12-25 year.
Methodology: Descriptive type/ cross sectional study was carried out in Bahawalpur Victoria hospital From15[th] September 2012 to 15th February 2013. 167 patients were included in this study by using non-probability convenience sampling technique. Data was collected from self-designed Performa with informed patient consent. Visual acuity was assessed by snellen acuity chart. Objective refraction was carried out by retinoscopy. Subjective refraction was also done by using trial box. After refraction, the height of the patient was measured in feet.
Results: In the range of height 4.8-5.4 feet there were 30 myopic and 35 were non myopic while in the range of height 5.4-6 feet 70 were myopic and 32 were non myopic. There is association between myopia and height (P<0.05).
Conclusion: There is significant association between myopia and height as myopia is more common in heighted individuals.
Keywords: Myopia, Axial length, Height.

INTRODUCTION

''Emmetropia is a state of refraction in which coequal matching rays of light coming from far point are focused on retina when the accommodation is at rest. So patient has no need to use active accommodation to see clearly at distant places.[1]

"Ametropia is state a of refraction in which coequal matching rays of light coming from far point (with the accommodation brings at rest) are not focus on retina"[2]An eye having no refractive error at is called emmetropic.[3]

Types of ametropia are myopia, hypermetropia and astigmatism.

Myopia is an optical condition in which coequal matching rays of light coming from far point are focused in front of the retina when accommodation is at rest[4]. When the optical system of the eye becomes too powerful it leads to myopia. In early twenties myopia progression stops usually but not in all cases[5].Heredity play an important role in adult myopia, having little effect from more near work, better grade sand less time in outdoor activity[6].

Myopia mostly starts in school – aged children or teenagers. Education levels and socioeconomic position also has influence on myopia[7]. Axial length is a main factor in myopia. Myopia is significant because its complications are retinal tears, retinal detachment, vitreous degenerations, choroidal hemorrhage and cataract. Divergent squint and may associated with primary open angle glaucoma. Types of Myopia are congenital myopia, simple myopia pathological myopia and acquired myopia. Sign and Symptoms are decrease of distance vision, asthenopia prominent and large eyes deep anterior chamber pupils are somewhat large and a bit sluggishly reacting. Fundus examination may reveal large optic disc, myopic crescents, degenerative changes in retina and choroid, posterior staphyloma and vitreous degenerations[8]**.**

Traits of refraction, axial length, corneal curvature, and anterior chamber depth depend on heredity. Genetic study of these traits provides explanation of refractive errors[9].

Females having increased weight have a significantly increased risk of myopia compared to those in the lightest weight in same age group Axial length and height has covariance of shared genes.[10]

A study was done on height and its relationship to refraction and axial length in Singapore Chinese children. If age, sex, congenital myopia, near work, institution, and weight kept constant heighted Chinese children were more myopic due to more axial lengths, deeper vitreous chambers, flatter corneas. A study in youth of Singapore reveals metabolic factors effect on the development of optical system.[11]

The growth of height also increases axial length of eye that leads to myopia in young boys and girls.[12]

Another study revealed that height and weight are linked to several eye conditions.[13]

Myopic males were 1.9 cm taller than non-myopic males in a population-based Finnish study.[14]

A study on myopes shows that they are 0.8 cm more height than emmetropes and hypermetropes were 0.2 cm short in height[15].In a population-based survey reveals that adult stature also determines the axial length of eye[16].

In a study that without specify any age group shows that children with myopia grew in both height and weight more quickly than children with stationary myopia.[17]

Optimal optical state may relate to body growth. In models that adjusted for myopia risk factors, taller children eyes with longer eyeballs, more vitreous chamber depths, and flatter corneas. Thickness of lens and anterior chamber depths were constant in taller children while axial length of eye increases due to vitreous chamber elongation in taller children.[18]

Increased height may be associated with myopia due to increased axial length of eye ball. There are shared genes of axial length and height.[19]

Plotting the changes of axial and height suggested that the changes of axial and height with age were constant; more changes were observed in younger children[20]

METHODOLOGY

Descriptive type/ cross sectional study was carried out in Bahawalpur Victoria hospital from 15th September 2012 to 15th February 2013 .167 patients were included in the study by convenience sampling. Patients of age 12-25 after their consent were included. Patients having any other pathology causing decreased vision were excluded from the study.

Data was collected from self-designed Performa with informed patient consent. Visual acuity was assessed by Snellen acuity chart. Objective refraction was carried out by retinoscopy. After subjective refraction, the height of the patient was measured without shoes and socks..Analyses of data was done by using Microsoft excel. Relationship of myopia with height was calculated by using chi square test.

RESULTS

Table 1: shows that out of total 167 sample 35 (21%) are in age group 12-16 years ,52 (31) are in age group 16-20 years and 80(48%) are in the age group of 20-24 year. Age Distribution

Age Ranges	Frequency	Percentage	Cumulative Frequency
12-16	35	21	35
16-20	52	31	87
20-24	80	48	167

Table 2 shows that in range of height 4.8-5.4 feet there were 30 myopic and 35 were non myopic while in the range of height 5.4-6 feet 70 were myopic and 32 were non myopic. This shows that there is association between myopia and height ($p<0.05$).The results are significant Association between height ranges and myopia.

Height Range	Myopic	Non Myopic
4.8-5.4	30	35
5.4-6.0	70	32

$p<0.05$

DISCUSSION

The burden of refractive errors has been estimated from 800 million to 2.3 billion globally. The total numbers of new myopia cases are related with age, country, gender, race, work, environment, and other factors. Comparisons of prevalence are difficult due to different method of data collection testing procedure.

A study in children of irrespective of age during school screening, children with axial myopia grew in both height and weight more quickly than children with non-progressive myopia [21]

This relates with all the studies done so far on this subject in height and myopia, which agree myopia is also associated with height.

According to this study out of 167 subjects 100 were myopic. In the range of height 4.8-5.4 feet there were 30 myopic and 35 were non myopic while in the range of height 5.4-6 feet 70 were myopic and 32 were non myopic. There is association exists between myopia and height ($P=0.05$)

A study concluded that myopia was not associated with height [22]

The change between the results of these studies may be due to different sample sizes, unspecified age and refractive error measurement procedures, or un-controlled variables

CONCLUSION

There is significant association between myopia and height as myopia is more common in heighted individuals. The individuals having height range of 5.4-6 feet should be screened for myopia as there are more chances of myopia in this range of height.

REFERENCES

1. Khurana AKErrors of refraction and binocular optical defects. In: Theory and practice of optics and refraction. 2nd Edition. Elsveir, India, 2008, Page No. 62
2. Khurana AKErrors of refraction and binocular optical defects. In: Theory and practice ofoptics and refraction. 2nd Edition. Elsveir, India, 2008, Page No. 71.
3. Khurana AK Errors of refraction and binocular optical defects. In: Theory and practice ofoptics and refraction. 2nd Edition. Elsveir, India, 2008, Page No 61- 2.
4. Khurana AK Errors of refraction and binocular optical defects. In: Theory and practice of optics and refraction. 2nd Edition. Elsveir, India, 2008, Page No 71.
5. Duke-Elder In: Duke-Elder's Practice of Refraction. 2nd Edition. [Elsveir, London], 1993 PageNo.5
6. Mutti D O, Mitchell G L, Moesch berger M L, Jones L A,ZadnikK. Parental myopia, near work,school achievement ,and children's refractive error. Investigative Ophthalmology & Visual Science, 2002; 43 (12): 3633 – 3640.
7. Shimizu N, Nomura H, Ando F, Niino N, Miyake Y,Shimokata H. Refractive errors and factors associated with myopia in an adult Japanese population. Jpn J Ophthalmol HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed/12586171". 2003; 47(1):6-12.
8. Khurana AK Errors of refraction and binocular optical defects. In: Theory and practice of optics and refraction. 2nd Edition. Elsveir, India, 2008, Page No 75.
9. Klein AP, Suktitipat BetAl.Heritability analysis of spherical equivalent, axial length, corneal curvature, and anterior chamber depth in the Beaver Dam Eye Study. Arch Ophthalmol. 2009; 127 (5):649-55
10. Dirani M, Islam A, Baird PN. Body stature and myopia-The Genes in Myopia (GEM) twinstudy. Ophthalmic Epidemiol HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed/18569807". 2008; 15 (3):135-9.
11. Saw SM, Chua WH et Al. Height and its relationship to refraction and biometry parameters in Singapore Chinese children. Invest Ophthalmol Vis Sci. 2002; 43(5):1408-13.
12. Yip VC, Pan CW et al The Relationship between Growth Spurts and Myopia in Singapore Children. Invest Ophthalmol Vis Sci. 2012; 3; 53 (13):7961-6.
13. Mori K, Ando F, Nomura H, Sato Y, Shimokata H. Relationship between intraocular pressure and obesity in Japan. Int J Epidemiol. 2000; 29: 661–6.
14. Teikari JM. Myopia and stature. ActaOphthalmol. 1987; 65: 673–6.
15. Teasdale TW, Goldschmidt E. Myopia and its relationship to education, intelligence and height: preliminary results form an on-going study of Danish draftees. ActaOphthalmol. 1988; 185: 41–3.
16. Johnson GJ, Matthews A, Perkins ES. Survey of ophthalmic conditions in aLabrador community: refractive errors. Br J Ophthalmol. 1979; 63: 440–8.
17. Gardiner PA. Physical growth and the progress of myopia. Lancet. 1955; 2:952–3.
18. Sorsby A, Benjamin B, Sheridan M. Refraction and its components during the growth of the eye from the age of three 1961. Medical Research Council Special Report Series No. 301
19. Zhang J, Hur YM et Al. Shared genetic determinants of axial length and height in children: the Guangzhou twin eye study. Arch Ophthalmol. 2011; 129 (1):63-8.
20. Wang D, Ding X, Liu B, Zhang J, He M. Longitudinal changes of axial length and height are associated and concomitant in children. Invest Ophthalmol Vis Sci. 2011; 52 (11):7949-53.
21. Gardiner PA. Physical growth and the progress of myopia. Lancet. 1955; 2:952–3.
22. Rosner M, Laor A, Belkin M. Myopia and stature: findings in a population of 106,926 males. Eur J Ophthalmol. 1995; 5: 1–6