A RETROSPECTIVE CLINICAL STUDY IN VARIOUS DEMOGRAPHIC FACTORS, AXIAL LENGTH AND CORNEAL RADIUS WITH RESPECT TO VARIOUS TYPES OF MYOPIA

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ABSTRACT

BACKGROUND

Myopia is a worldwide common type of refractive error. Axial myopia is responsible for around 75% of the refractive error-related complications with serious social and economic consequences. In Western Europe, the estimated prevalence of myopia is over 25%. Myopia is a common cause of reversible blindness in India with a prevalence of 27%. The axial length will not only identify the determinants of eye elongation, but also provide aetiological evidence for myopia. WHO recent report reveals that in 2002, the number of people who have visual impairment caused by myopia and other ocular disorders reached over 161 million.

Majority of eye growth takes place in the first 18 months of life. The changes in axial length appears to be compensated by the progressive corneal flattening with age in normal eyes; The majority of axial length elongation takes place in the first 3 to 6 months of life and a gradual reduction of growth occurs in 2 years and adult eye size is attained by 3 years of age. The higher prevalence of myopia seen among Asian countries such as China, Singapore, Malaysia and Taiwan.

MATERIALS AND METHODS

Our study was a retrospective, clinical comparative study in axial length and corneal radius between low myopia, moderate myopia and high myopia. Total number of cases studied was 120 cases of different types of myopia. After getting written informed consent from all the individuals included in this study, clinical examination was conducted.

This study was conducted at Ophthalmology Department, Government Kilpauk Medical College and Hospital, Kilpauk, Chennai. The sample size was 120 in numbers. Only myopia of various levels like low myopia up to -3.0 dioptre spherical power, moderate myopia from more than -3.0 to -6.0 dioptre spherical powers and high myopia of more than -6.0 dioptre spherical were studied.

The normal axial length is 22 to 25 mm. In this study, the association of posterior segment degenerative changes in relation with increased axial length >25 mm will also be studied.

Total cases considered for refractive error evaluation were 7203. Out of these, 1800 individuals were suffering from various refractive errors like myopia, hypermetropia and astigmatism. Myopia of various types was noticed in 600 cases. As per age group range from 5 to 40 years, there were 120 cases of different types of myopic individuals were taken into consideration for our study. Both genders of male and female sex were included in this study. Since, in the study, the age-related cataract association also excluded, the upper age limit was taken as 40 years. Total duration of study period was 7 months from January 2017 to July 2017.

Routine eye examination like distant visual acuity by Snellen's chart and auto refractometer, colour vision by Ishihara chart, Corneal Curvature (CR) by auto kerato-refractometer, intraocular pressure by Schiotz tonometer, slit-lamp examination, fundus examination by direct or indirect ophthalmoscope, axial length of eye by A scan, fundus photograph and in selected cases B-scan, etc. were performed.

RESULTS

In our study, various types of only myopia were 33.33%. Our study of 120 cases of various types of myopia between the age group of 5 to 40 years showed increased female sexual prevalence. The sexual prevalence as male:female = 46:74. All 120 cases were associated with myopic refractive error of both eyes either same type of myopia or in combination. In all types of myopic cases, increased female sexual prevalence was noticed. The age group prevalence has reported around 11 to 20 years in all types of myopic individuals. Axial lengths of normal range of 22 to 24 mm were noticed in 67 cases of mild myopic individuals. The visual acuity status in 76 cases of unilateral low myopic individuals reported 65 of them had normal vision (85.53%). Normal ranges of corneal radius as 7.51 to 7.8 mm range 3 cases and between 7.0 to 7.5 mm range 73 cases were reported. Nine cases of low myopic also have elongated AL of more than 24 mm and two cases with AL of more than 25 mm. Among these individuals, eight individuals were having CR less than 7.50 mm correlating the reduction of CR as elongation of AL of eyeball occurs. In two cases of low myopia, the axial length was shown more than 25.0 mm values with reduction of CR 7.15 mm and 7.35 mm without any degenerative changes in posterior segment of eye. The axial length of more than 25 mm was reported in totally 17 cases and majority of cases were associated with posterior segment degenerative changes in the fundus.

The 14 high myopic cases having laterality as unilateral:bilateral = 6:8. As far as corneal radius is concerned, between 7.0 to 7.5 nine and between 7.51 to 7.8 mm five individuals were found. This reveals that in high myopia the corneal curvature steepening resulting in less corneal radius value is seen. This reveals that 57.1% of cases presented with normal vision among high myopia detected and only 42.9% of cases only presented with 20% visual disability. The increased axial length more than

25 mm was noticed in six cases, of which four cases were bilateral high myopia and two cases were presented with unilateral high myopia. Three individuals with high myopic power of more than -10.0 dpt with more than 25 mm of AL were having CR 7.5 in one case and 7.6 mm and 7.7 mm one case each. This again depict that high myopia with increased AL, need not present with reduction of CR.

Out of 52 moderate myopic individuals, bilateral moderate myopia 34 cases and unilateral moderate myopia 18 cases were reported. In unilateral moderate myopia, out of 18 cases, 15 individuals were presented with 22 to 25 mm normal range of AL, but three cases were more than 25 mm of AL. The corneal radius between 7 to 7.5 mm in 28 cases in bilateral moderate myopia, while in 17 cases in unilateral myopia between 7 to 7.5 mm of corneal radius was present.

Various ocular findings in pathological myopia leads to visual loss are complicated cataract, rhegmatogenous retinal detachment, macular haemorrhage, Forster-Fuchs spot and macular hole. Forster-Fuchs spot is hyperplasia of retinal pigment epithelium associated with subretinal neovascularisation and choroidal haemorrhage in the macula giving rise to Forster-Fuchs spot, which is the common cause for loss of vision in pathological myopia.

CONCLUSION

This study indicates the early identification of degenerative changes in high myopia and early management will prevent visual loss in the individuals. The study clears that the yearly follow up of low myopic from second decade will identify the progression of low myopia into moderate myopic level and moderate myopia to the high myopic level earlier. Also, vitreoretinal degeneration, asthenopic symptoms, amblyopia and visual loss causing posterior segment lesions can be identified and early management can be done. In our study, we noticed that the increased axial length with steepening of cornea with low CR values need not reflect in all cases of moderate and high myopic individuals.

KEYWORDS

Axial Length (AL), Corneal Radius (CR), Low Myopia, Moderate Myopia, High Myopia, Unilateral, Bilateral, Prevalence, Visual Acuity.

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BACKGROUND

Myopia can be classified using different criteria. For example, physiological myopia and pathological myopia are differentiated by the presence of degenerative changes and the value of refractive error. Based on the onset, myopia can also be divided into 3 groups- youth-onset myopia (less than 20 years old), early adult-onset myopia (age between 20 and 40 years) and late adult-onset myopia (over 40 years old). Other classifications include- axial myopia and non-axial myopia; low myopia (up to -3.0 dpt), moderate myopia (more than -3.0 dpt to -6.0 dpt) and high myopia (more than -6.0 dpt); syndromic myopia and non-syndromic myopia. In genetic domain, non-syndromic myopia can be separated into two categories- myopia following complex traits, which is determined by both genetic and environmental factors; myopia showing Mendelian pattern of inheritance, which is normally found by family studies and mainly caused by genetic mutations.

Myopia prevalence was higher in urban population (6.9%) in comparison to rural population 2.77%. Moorthy et al assessed the prevalence of refractive errors and related visual impairment in school going children of 5-15 years of age in an urban population in New Delhi and reported a prevalence of 7.4% of myopia.

Prevalence of myopia and high myopia increased significantly with age and were associated significantly with nuclear sclerosis. The prevalence of hyperopia increased until 60 years of age and then decreases. Hyperopia was more common among women than men and was negatively associated with nuclear sclerosis. Uncorrected refractive error is the most common cause of reversible blindness in India.[1] Studies from urban India suggests that 49.3 million of those aged >/= up to 15 years may have refractive errors.[2] In India, screening camps at schools and villages have been conducted to assess the prevalence of refractive errors among children.

Dandona et al studied an urban population in south India and reported that 42.16% of population had refractive error with prevalence of 70.8% and 18.8% for myopia and hyperopia resp. As people ages, the refractive status of their eyes also changes. This is predominantly attributed to changes in the crystalline lens. Several other factors including genetic[3] and environmental influences like near works,[4] night lighting[5] and UV exposure.[6] Racial difference in tropical countries such as India and West Indies maybe responsible for early aging of crystalline lens and other associated myopia are also believed to play a role in the refractive status of the eye. High myopia above -6.0 dpt with axial length of 26.0 mm or above is connected with process of degenerative myopia[6] and leading cause of blindness

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because of its association with retinal detachment, macular and choroidal degeneration, premature cataract and glaucoma.[7]

Age-related AL differences were discovered in some investigations. Older people were likely to have shorter AL than younger patients. Near work was more intensive in the younger age group, which is a factor increasing AL probably due to a defocus induced disturbance of emmetropisation.[8] Los Angeles Latino Eye Study did not reveal an age-related AL difference based on a population of 5588 over a period of 40 years.[9] Women tend to have a shorter AL[10,11] partly explained by stature.[12] Axial lengthening is the main morphological factor related to myopia.

Most agree that axial length is the largest determinant of refractive error. Longer the axial length, the severer is the myopia. Age-related axial length differences were discovered in some investigations. Older people were likely to have shorter axial length than younger people. Axial length increases rapidly in the early stage of life, then slowly increases until adulthood, then decreases in old age.[12] A cohort study reported that the average axial length for full term infants increases from 16.8 to 23.6 mm when they become adults. The lens will reduce its refractive power when AL increases.

Osuobeni[13] suggested that the ratio between AL and corneal radius maybe a better indicator of myopia. AL shows diurnal fluctuation of around 15-40 mum with a mean period of about 21 hours.[14] Eyes with induced myopia were observed to have longer AL. Environmental factors such as extensive near work act as triggers of myopia.

Growth of axial length during childhood is accompanied with some variation in the corneal power.[15] Several studies have demonstrated the relationship between Corneal Radius (CR) and AL especially in emmetropes. During emmetropization, the increase in AL of eye will be counteracted by an increase in the CR to maintain emmetropia.

Paradoxically, other authors have found that the most myopic subjects those with greatest ALs have smaller corneal radii. Other authors find no relationship between AL and CR in any category of myopes. Sorsby and Leary[15] suggested that ocular growth ceases around the age of 14-15 years based on cross-sectional study involving 1500 individuals aged 3 to 22 years.

Pubertal changes and endocrine changes will affect progress of myopia or elongation of axial length.

The phenotype of myopia especially high myopia is accompanied with other eye disorders like glaucoma, cataract and chorioretinal abnormalities.[16] AL increases as per lengthening of vitreous chamber.[17,18]

Read et al[19] found the association between the change in AL and change in IOP, while no evidence was found by Wilson et al that IOP fluctuation appears to cause diurnal AL fluctuation.

Myopia can be treated as a Mendelian trait caused by a single gene, or a complex trait, affected by multiple genetic factors and environmental factors depending on the underlying mechanism. So far, more than 20 chromosomal areas have been proposed to contain potential myopia corresponding genes. Evidence support strong genetic components in the determination of AL. Children with myopic parents have higher chance of being affected and have longer AL than those without myopic parents.[19] Twin studies also demonstrated that AL is highly heritable and genetic effects can explain up to 88% of this parameter.[20,21] Segregation analysis suggested that AL is under polygenic control.[22] AL and myopia may share common genes.[23]

Myopia has become a major public health concern for different reasons. First in developed countries in the East and Southeast Asia, the prevalence of myopia has rapidly increased in the past 50-60 years. The highest prevalence estimates for myopia are for young adults in the East Asia with estimates reaching 90% in some urbanised and highly educated populations. These changes are not restricted to urbanised East Asia, since the prevalence of myopia is also increasing in North America. The WHO recognises that myopia if not corrected it will be a major cause of visual impairment. People with high myopia are at increased risk of potentially blinding myopic pathologies, which are not prevented by optical correction. Subjects with high myopia mainly develop with increase in AL of the eye rather than optical changes in cornea or lens.

The normal axial length of eye is approximately 23.30 mm. More than 25 mm is considered as significant increased axial length. Considering the central corneal power is the same for each eye at normal axial lengths for every 1 mm of axial length difference, 3.0 D difference in the refractive error can be anticipated. The normal value of corneal curvature of the anterior surface of cornea is 7.8 mm.

AIM AND OBJECTIVES

The aim of this study is to observe the various types of myopia with respect to various demographic factors like age, sex, laterality, prevalence of age groups, visual acquity, posterior segment lesions threatening visual loss and their prevalence, associated syndromes in myopia, comparison of axial length with corneal radius and prevalence of degenerative fundus changes with increase in AL.

This study indicates the early identification of degenerative changes in high myopia and early management will prevent visual loss and amblyopia in the individuals. The yearly followup of low myopic individual will help to identify the progression of low myopia into moderate myopia and also high myopia level and anisometropic amblyopia can be prevented. The role of increased axial length corresponding to degenerative changes in posterior segment of eye like peripheral retinal degeneration (lattice) and retinal break, rhegmatogenous retinal detachment can be identified and treated with appropriate treatment will prevent from total blindness.

MATERIALS AND METHODS

Our study was a retrospective, clinical observational study in axial length and corneal radius between low myopia, moderate myopia and high myopia. Total number of cases studied was 120 cases of different types of myopia. After getting written informed consent from all the individuals included in this study, clinical examination was conducted.

This study was conducted at Ophthalmology Department, Government Kilpauk Medical College and Hospital, Kilpauk, Chennai. The sample size was 120 in numbers. Only myopia of various levels like low myopia up to -3.0 dioptre spherical power, moderate myopia from more than -3.0 dioptre spherical to -6.0 dioptre spherical powers and progressive high myopia of more than -6.0 dioptre spherical were studied.

Total cases considered for refractive error evaluation were 7203. Out of these, 1800 individuals were suffering from various refractive errors like myopia, hypermetropia and astigmatism. Myopia of various types was noticed in 600 cases. As per age group range from 5 to 40 years, there were 120 cases of different types of myopic individuals were taken into consideration for our study. Both genders of male and female sex were included in this study. Refraction convenience with cooperation of individuals for studies under instruments, the selection of age group from 5 years to 40 years were considered. Since, in the study, the age-related cataract association also excluded, the upper age limit was taken as 40 years.

Total duration of study period was seven months from January 2017 to July 2017.

Routine eye examination like distant visual acuity by Snellen's chart and auto refractometer, colour vision by Ishihara chart, Corneal Curvature (CR) by auto kerato-refractometer, intraocular pressure by Schiotz tonometer, slit-lamp examination, fundus examination by direct or indirect ophthalmoscope, axial length of eye by A scan, fundus photograph and B scan in selected cases were performed.

Axial length of eye lengthening and steeper corneal curvature with reduced corneal radius in case of high myopia was compared with low and moderate myopic individuals. Prevalence of visual impairment in case of high myopia where axial length of eye increased was also studied with posterior segment degenerative findings. Correlation of corneal curvature reduction from normal value of 7.8 mm with increase in axial length of eyeball beyond 25 mm in case of high myopia was studied. Axial length is the primary determinant of non-syndromic myopia.

Overlapping of various types of myopia in the individuals also studied, so that anisometropic amblyopia preventive methods can be advised to the patients.

Inclusion Criteria

Both genders of age group between 5 and 40 years having myopic refractive error only taken into consideration in this study. All types of myopic individuals were included in our study.

Exclusion Criteria

Newborn babies to less than 5 years age group, beyond 40 years age group individuals, other than myopic refractive error cases, previous history of ocular surgery, ocular pathology, age-related cataract and systemic illness cases, the nocturnal myopic, induced myopic (steroids, pilocarpine, acetylcholine, neostigmine) and pseudomyopia cases were excluded in our study.

RESULTS

Out of 1800 cases of various refractive errors like myopia, hypermetropia and astigmatism among all age groups, 600 cases were found to be in association with various types of only myopia of all age group (33.33%). Out of this, 120 cases of the age group between 5 to 40 years were considered in our study.

Our study showed increased female sexual prevalence as male:female = 46:74. All 120 cases were associated with myopic refractive error of both eyes either same type of myopia or in combination. As far as, the laterality of various types of myopia is concerned, bilateral low myopic:moderate myopic:high myopic = 60:34:8. The prevalence of their percentage was 50.00%, 28.33%, 6.67%. Among the combination of various types of myopia, the prevalence was 15.00%. In low myopia, 60 cases were bilateral and 16 cases were unilateral low myopia (with other eye having other types of myopic combination) with increased female sexual prevalence and increased age prevalence between 11 to 20 years was noticed in our study. Sexual prevalence was male:female = 24:52. 53.95% AL of normal range of 22 to 24 mm was noticed in 67 cases of mild myopic individuals. Only nine individuals were presented with more than 24 mm of AL length indicating the progression of low myopia into moderate and high myopic status in later age group can occur.[15] 16 cases of unilateral low myopia and the other eye moderate myopia indicates the unilateral low myopia can turn out to the stage of moderate myopia in later age group.

The laterality affection of unilateral low myopia is RE:LE = 1:2. The visual acuity in 65 individual had normal vision (85.53%) and remaining 11 cases were presented with visual acuity 6/12-6/9.

The corneal radius between 7.51 to 7.8 mm ranges 3 cases and between 7.0 to 7.5 mm range 73 cases were reported. Nine cases of low myopic also have elongated AL of more than 24 mm and two cases with AL of more than 25 mm.

Among these individuals, nine individuals were having CR less than 7.50 mm correlating the reduction of CR as elongation of AL of eyeball occurs.[10,11] In two cases of low myopia, the axial length was more than 25.0 mm with reduction of CR. 7.15 mm and 7.35 mm without any degenerative changes in posterior segment of eye. This necessitates for followup of the case yearly to monitor whether these individuals land up to level of moderate or high myopia stage in future. 14 cases of unilateral low myopia with other eye moderate myopia and two cases with high myopia in our study was noticed.

Fourteen cases of high myopic individuals with increased age prevalence as between 11 to 20 years with increased female sex prevalence occurrence. Among the high myopic axial length of more than 25 mm were noticed in six individuals.

In our study, the increased female sex prevalence as male:female = 3:4 and all individuals fall between 5 to 40 years.

The high myopic having laterality as unilateral and bilateral as 6 cases and 8 cases, respectively.

Out of 14 cases of high myopic, 6 cases having AL 24-25 mm, 6 cases having AL 25-26 mm and 2 cases having >26 mm. As far as, corneal radius is concerned between 7.0 to 7.5 nine and between 7.51 to 7.8 mm five individuals were found. This reveals that in high myopia the corneal curvature steepening resulting in less corneal radius values are seen.[10,11] Normal vision in 57.1% cases was reported.

The increased axial length more than 25 mm was noticed in six cases, of which, four cases were bilateral high myopia and two cases were presented with unilateral high myopia. In six cases of increased axial length of more than 25 mm, the CR value of less than or equal to 7.5 mm in 3 cases and >7.5 mm in 3 cases was noticed. This indicates, in our study, the corneal curvature steepening as axial length increase need not occur. Similarly, posterior staphyloma[16] was not associated when the AL goes to the level of 26.38 mm and CR 7.2 mm in two cases. 3 cases >-10.0 dpt with >25 mm of AL were having CR 7.5 in one case and 7.6 mm and 7.7 mm one case each. This again depict that high myopia with increased AL need not present with reduction of CR.

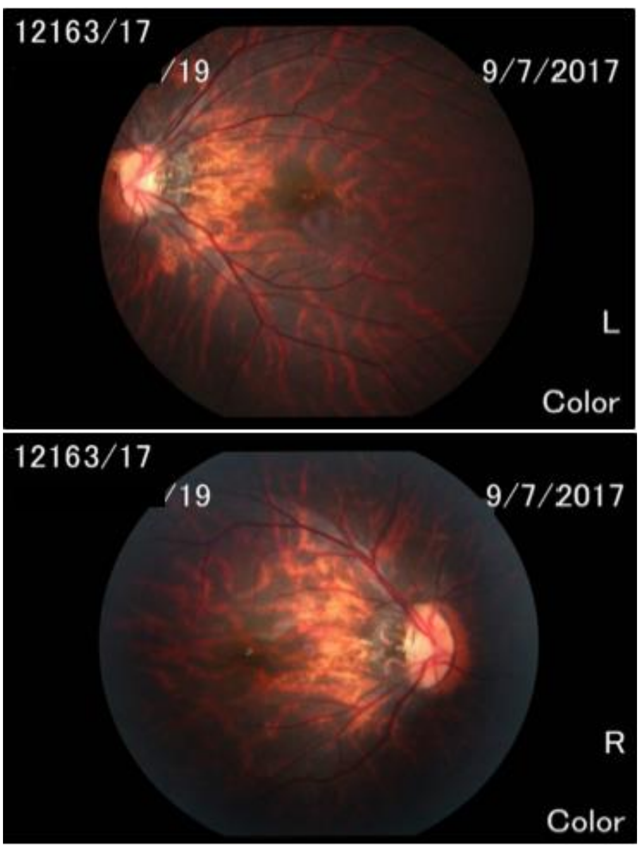

Figure 1. Fundus Photograph of 19/Male with Bilateral High Myopia with RPE Degeneration, Tessellated Fundus, Temporal Crescent, Nasal Super Traction and Enlarged Disc with Physiological Cup

One case of Down's syndrome and one case of albinism presented with high myopia and moderate myopia, respectively. Posterior vitreous detachment with vitreous floaters was noticed in two cases of high myopia.

Out of 52 moderate myopic individuals, bilateral moderate myopia 34 cases and 18 cases with unilateral moderate myopia (other eye with other type of myopic combination) were reported. Among the unilateral moderate myopia, the other eye simple myopia 14 cases, high myopia 4 cases were seen. The sexual prevalence in moderate myopia male:female = 23:29.

Among the normal axial length range 22 mm to 25 mm, 30 moderate myopia individuals were reported and more than 25 mm AL in four individuals were seen. In unilateral moderate myopia, out of 18 cases, 15 individuals were presented with 22 to 25 mm normal range of AL, but 3 cases were more than 25 mm of AL. The corneal radius between 7 to 7.5 mm in 28 cases in bilateral moderate myopia, while in 17 cases in unilateral myopia between 7 to 7.5 mm of corneal radius was present. More than 7.5 mm in six cases in bilateral moderate myopia and one case in unilateral moderate myopia were present. The visual acuity in 36 cases was normal, whereas in 9 cases, the visual acuity ranges from 6/12 to 6/9 and visual acuity 6/60 to 6/18. Seven cases were noticed. Among these, 7 cases suffering from defective vision, four cases were in unilateral high moderate myopia with high anisometropic amblyopia.

One case was albinism with bilateral moderate myopia with RPE depigmentation and macular hypoplasia with nystagmus.

	Unilateral- One Eye Low and Other Eye		**Bilateral**
	Moderate	**High**	
Low myopia	14 cases	2 cases	60 cases
	Unilateral- one eye moderate and other eye		Bilateral
	Low	**High**	
Moderate myopia	14 cases	4 cases	34 cases
	Unilateral- one eye high and other eye		Bilateral
	Moderate	**Low**	
High myopia	4 cases	2 cases	8 cases

Table 1. Prevalence of Various Types of Myopic Combination Seen in Our Study

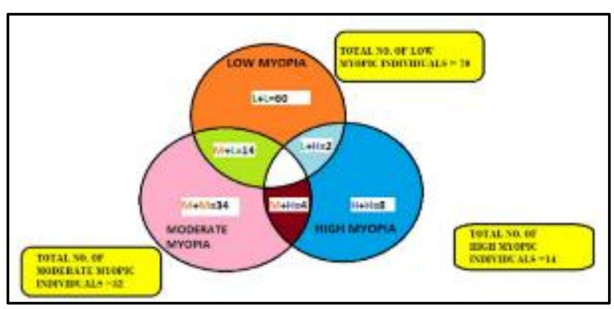

Figure 2. Diagram Showing Various Types of Myopia Both Bilateral and Unilateral Distribution

Sex	Number of Cases	Percentage
Male	46	38.33%
Female	74	61.67%

Table 2. Sex Prevalence of Various Types of Myopia in Our 120 Case Study

The observation was increased. Female prevalence of 61.67% compared to male (38.33%).

Age Group (in Years)	5-10	11-20	21-30	31-40
Number of Cases	20	62	28	10

Table 3. Age Group Prevalence of Myopic Cases in Our Study

Increased prevalence in age group between 11-20 years (51.66%) was found.

	Number of Cases
Positive family history of myopia	27
No positive family history of myopia	93

Table 4. Genetic Prevalence of Myopic Cases in Our Study

	Low	Moderate	High
Male	24	23	6
Female	52	29	8

Table 5. Sexual Prevalence of Various Myopic Individuals in Our Study

In all types of myopia, female prevalence was more compared to male.

Posterior Segment Findings	Number of Cases
Myopic crescent	14
Annular crescent	14
Peripapillary atrophy	14
Enlarged physiological cup	14
Choroidal atrophy	7
Forster-Fuchs spot	Nil
Retinal break and rhegmatogenous RD	1
PVD with vitreous floaters	2
Myopic foveoschisis and macular hole	Nil

Table 6. Prevalence of Posterior Segment Findings in Various Types of Myopia

In high myopia, all 14 cases were presented with posterior segment degenerative changes.

	Low Myopia	Moderate Myopia	High Myopia
7-7.5 mm	73	45	9
7.51-7.8 mm	3	7	5

Table 7. Corneal Radius in Various Types of Myopia

In all types of myopia, CR values were lower side in our report.

Axial Length	Low Myopia	Moderate Myopia	High Myopia
22-24 mm	67	30	
24-25 mm	7	15	6
25-26 mm	2	7	6
>26 mm			2

Table 8. Axial Length of Eye (in Dioptre) in Various Types of Myopia in Our Study

In our study, even in low and moderate myopia, increased AL >25 mm without degenerative fundus changes was seen. Similarly, in high myopia, 43% of cases were presented with normal AL reading.

	Number of Cases	Number of Cases	Number of Cases	Number of Cases	Number of Cases
	CR <7.5 mm AL >25 mm	CR >7.5 mm AL <25 mm	CR >7.5 mm AL >25 mm	CR <7.5 mm AL <25 mm	CR <7.5 mm AL >26 mm
Low	11	65			
Moderate			7	45	
High	4	3	5		2

Table 9. Comparison of Corneal Radius Vs. Axial Length Variation Cases Reported in Various Types of Myopia in Our Study

Variability in AL and CR was found in all types of myopia.

Visual Acuity	Low	Moderate	High
6/6	65	36	8
6/12-6/9	11	9	2
6/60-6/18	0	7	1
CFC + to <6/60	0	0	3

Table 10. Corrected Visual Acuity Analysis in Various Types of Myopia

Gross defective vision was seen in moderate and high myopic individuals. In low myopia, 85.53% cases were having normal visual acquity after refraction. Gross visual loss was seen in moderate myopia next to high myopia probably due to posterior segment vitreoretinal degenerative complications and anisometropic amblyopia.

Findings	Number of Cases
Deep anterior chamber	20
Pigmentary glaucoma	0
Posterior subcapsular cataract	2
POAG	1
Amblyopia	4
Pseudo proptosis	2
Krukenberg's spindle	0

Table 11. Other Ocular findings in Various Types of Myopia

Findings	No. of Cases
Tessellated fundus	14
Temporal crescent	14
Large physiological cup	14
Annular crescent	14
Vitreous degeneration/floaters/PVD	2
Retinal degeneration (cystoid, lattice)	1
Retinal tear	Nil
Rhegmatogenous retinal detachment/retinal hole	1
Posterior staphyloma	Nil
Choroidal degeneration/atrophy	2
Subretinal neovascularisation	Nil
Foster Fuchs spot/macular haemorrhage	Nil

Table 12. Posterior Segment Findings in High Myopia

Anomalies	Number of Cases
Albinism	1
Down's syndrome	1
Gyrate atrophy	0
Stickler's syndrome	0
Megalocornea	0
Marfan syndrome	0

Table 13. Presence of Various Associated Anomalies in Our Study

DISCUSSION

Out of 120 cases studied, both bilateral as well as unilateral overlapping with various types of myopia in other eye reported with increased female sexual prevalence[4] and increased age prevalence between 11-20 years.[4] Our study reflected the positive family history of myopia in 22.50% cases, increased female sexual prevalence (61.67%), increased prevalence of age group of 11-20 years (51.67%), increased bilaterality affection in all types of myopia, increased bilaterality low myopic affection (58.82%) compared to moderate and high myopia.

Visual improvement to normal level (6/6) in 65 cases was noticed (85.53%) among 76 cases of low myopic analysis. In case of moderate myopia is concerned, visual improvement to normal level (6/6) in 36 cases (69.23%) out of 52 cases of moderate myopic analysis. In case of high myopia, eight cases had normal vision (57.14%) out of sixteen cases of high myopic analysis. All the patient's refractive errors were corrected by spectacles or contact lens.

All 14 high myopic cases were associated with posterior segment myopic degenerative findings like temporal crescent, tessellated fundus, large disc with large physiological cup annular crescent.[16] One case was presented with lattice degeneration with retinal break advised for laser therapy.[5]

CONCLUSION

The yearly follow up of low myopic reported in first and second decade will identify the progression of low myopia into moderate as well as high myopic stage earlier thereby early management by spectacles, contact lens, refractive surgeries and appropriate surgical intervention will prevent the individual from amblyopia and permanent visual loss.

In our study, we found the increase in axial length of more than 25 mm in high myopic corresponds with degenerative fundus changes. Our study regarding the comparison of corneal radius and axial length revealed that reduction of CR value need not occurs in all case of increased AL of >25 mm.

Our study also clears that in low myopia, nearly 73 out of 76 cases (96.05%) have been reported with <7.5 mm CR value and in 9 cases with AL 24-26 mm and CR <7.5 mm revealing the variability in CR and AL also can occur in simple myopia.

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