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Original Research Article

Correlation of myopia with age, axial length and anterior chamber depth

Avleen Kaur, Sanjay Kai, Bhavani Raina*

Department of Ophthalmology, Government Medical College, Jammu, Jammu and Kashmir, India

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***Correspondence:**
Dr. Bhavani Raina,
E-mail: bhavaniraina@yahoo.co.in

ABSTRACT

Background: Uncorrected myopia or near sightedness is a major cause of vision impairment and legal blindness in younger population. It has huge social, psychological, economic and developmental implications. Changes in anterior chamber depth and a significant increase in axial length increase the risk of myopia which can lead to a number of visual complications.
Method: This hospital based observational study was conducted in the OPD of department of ophthalmology, government medical college, Jammu over a period of one month from November 2022 to December 2022. A total of 100 patients were involved in this study. Data was interpreted in both descriptive and inferential statistics i.e., frequency and percentage distribution by using SPSS, version 22.
Results: It was observed that maximum patients were in the age group of 21-30 years (46%) and male:female ratio was 1.38:1. A positive correlation was found between myopia with axial length and anterior chamber depth ($p<0.05$).
Conclusions: Understanding the role of ocular biometric parameters in myopia is important in not only interpreting the disease pattern but also modelling the pathology and management of ocular diseases. It will go a long way in reducing the burden of myopia and its associated complications.

Keywords: Myopia, Axial length, Anterior chamber depth, Vision

INTRODUCTION

Myopia also known as near-sightedness is a condition of refractive error wherein the parallel rays of light coming from infinity are focused in front of the retina rather than on the retina. It is a complex of genetic and environmental interactions. It is a major cause of vision impairment and legal blindness seen more frequently in younger generations like school-going children and young adults. It has huge social, psychological, economic and developmental implications.[1]The prevalence of myopia in urban areas of India has been projected to spike to 48% by 2050.[2] Myopia can be graded as low <-3D, moderate -3 D to -6 D, and high > -6.0 D. It can also lead to various degenerative changes in the retina leading to irreversible vision-threatening sequel.[3,4]

While increase in number of myopes is a cause of concern, it is not being given enough importance in India due to lack of awareness and insufficient scientific literature.[5,6]

In view of the morbidity associated with myopia, the present study was conducted to determine the correlation of myopia with age, gender, axial length and anterior chamber depth in the OPD of department of ophthalmology, government medical college, Jammu.

Aims and objectives

Aim and objectives were to evaluate correlation of myopia with age, axial length and anterior chamber depth

and to determine if there is any correlation between myopia and gender of the patient.

METHODS

This hospital based observational study was conducted in the OPD of department of ophthalmology, government medical college, Jammu over a period of one month from November 2022 to December 2022. After obtaining approval from IEC vide letter no. IEC/GMCJ/2022/1126, a total of 100 patients were included in the study.

Inclusion criteria

The study included patients between 10-40 years of age and myopia ≥1 D.

Exclusion criteria

Patients with previous ocular surgery, previous or existing ocular pathology and compound myopic astigmatism were excluded.

A detailed history and examination were done in the study participants which comprised of visual acuity measurement using Snellen's visual acuity chart, slit lamp evaluation of the anterior segment, optical biometry using IOL master for measuring anterior chamber depth and axial length, non-contact tonometry for recording the intra ocular pressure (IOP) and dilated fundus examination using indirect ophthalmoscope.

Data was recorded in Microsoft excel sheet and analysed by using SPSS, version 22. Data was interpreted in both descriptive and inferential statistics i.e., frequency and percentage distribution. Categorical variables were expressed as number and percentage.

RESULTS

The present study evaluated a total of 100 patients to determine the correlation of myopia with age, sex, axial length and anterior chamber depth.

In the present study maximum patients (46%) were falling in the age group of 21 to 30 years (Table 1). The male to female ratio was 1.38:1 with 58% of the patients being male (Figure 1).

Table 1: Age distribution of patients, (n=100).

Age (Years)	N	Percentages (%)
11-20	20	20
21-30	46	46
31-40	32	32

It was observed that most (38%) of the study subjects had myopia in the range between 2.25-4 D, followed by 4.25-6 D (27%), 6.25-8 D (14%), 0-2 D (12%), 8.25-10 D (7%) and >10 D in 2% (Figure 2).

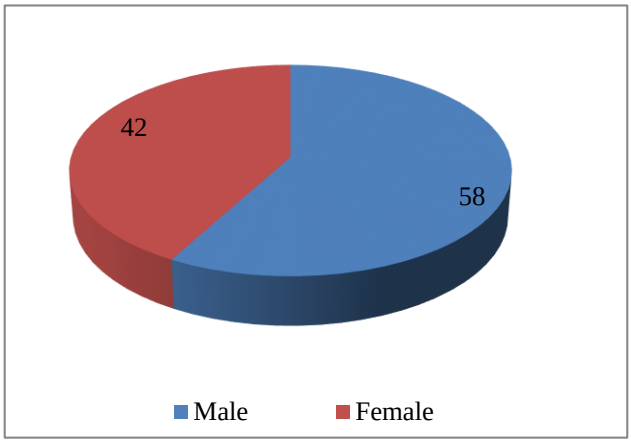

Figure 1: Gender distribution of patients.

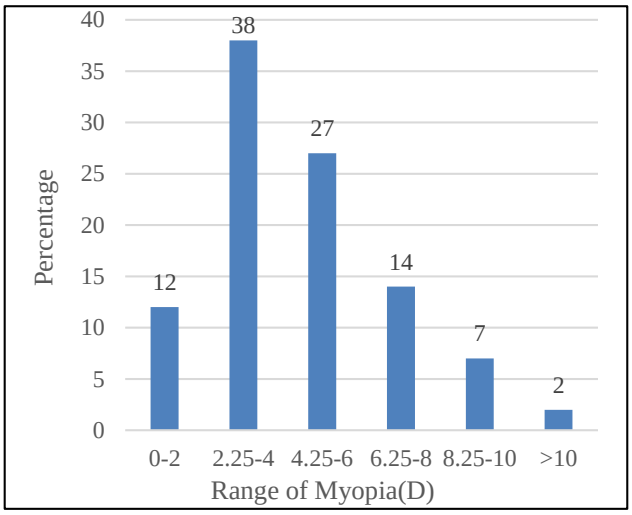

Figure 2: Distribution of patients according to the range of myopia.

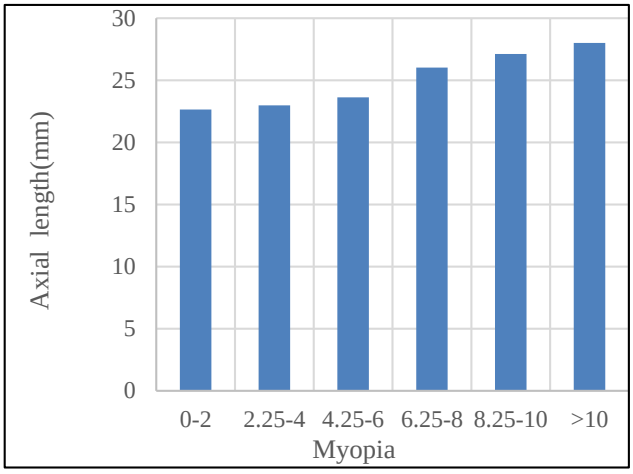

Figure 3: Correlation between myopia and axial length.

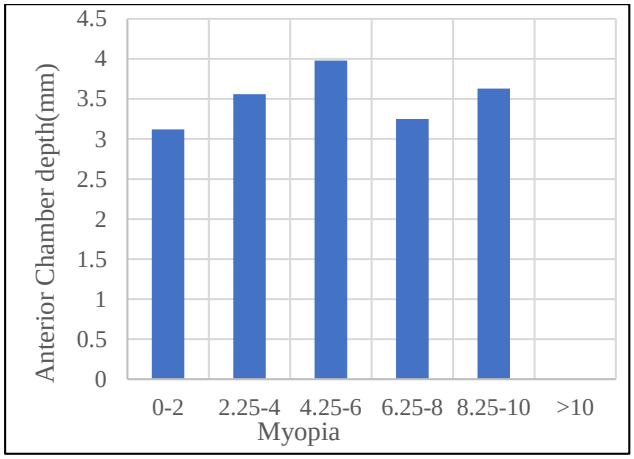

Figure 4: Correlation between myopia and anterior chamber depth.

A significant positive statistical correlation was found between myopia and axial length with p=0.01 where increase in axial length led to increase in myopia (Figure 3). Our study also showed a positive correlation between myopia and anterior chamber depth with p=0.03 where an increase in the anterior chamber depth showed an increase in myopia (Figure 4).

DISCUSSION

Myopia develops when there is an increase in the axial length (AL) relative to the focal point of the ocular refractive component which is measured as the distance from the corneal surface to an interference peak corresponding to the retinal pigment epithelium/Bruch's membrane.[7]

Anterior chamber depth (ACD) also plays an important role in the final refractive error.[8]

There is also some literature suggesting role of the axial ocular dimensions that may vary with age, gender and height of the individuals.[9]

Our study found maximum patients to be in the age group of 21-30 years with male preponderance similar to previous studies.[10,11] It was observed that the most (38%) of the subjects had myopia in the range between 2.25-4 D similar to study conducted by Bansal et al and Raja et al.[12,13]

A significant positive statistical correlation was found in our study where an increase in axial length led to increase in degree of myopia in accordance with study conducted by Raja et al.[13] Our study also showed that as the anterior chamber depth increases, there occurs an increase in degree of myopia similar to study conducted by Roy et al and Lee et al.[9,11]

This study has limitations as it was conducted on a small sample size on subjects presenting to eye OPD. We need more such studies on a larger scale with varied population and ethnicity to study correlation of myopia with age, axial length and anterior chamber depth.

CONCLUSION

Our study showed a positive correlation between myopia, axial length and anterior chamber depth where an increase in these parameters led to an increase in myopia. Understanding the role of ocular biometric parameters in myopia is important in not only interpreting the disease pattern but also modelling the pathology and management of ocular diseases. It will go a long way in reducing the burden of myopia and its associated complications.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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