



ORIGINAL ARTICLE

Severity of myopia in children presented at KDA district head quarter teaching hospital Kohat.

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Article Citation: Khan S, Alam M, Mohammad L. Severity of myopia in children presented at KDA district head quarter teaching hospital Kohat. Professional Med J 2022; 29(6):834-838. <https://doi.org/10.29309/TPMJ/2022.29.06.6767>

ABSTRACT... Objective: To evaluate the severity and relationship of myopia with age of the children. **Study Design:** Descriptive Cross Sectional study. **Setting:** Eye OPD DHQ Teaching Hospital KDA Kohat. **Period:** January 2021 to June 2021. **Material & Methods:** The sample size was 200 children with myopia and the age limit was 5-19 years. To determine the severity of myopia in children of age limit 5-19 years presented at DHQ and teaching hospital Kohat, the children were included into the study based on the inclusion criteria, the cycloplegic refraction was done and then the spherical equivalent of the refractive error was recorded and based on that the children were categorised as having mild, moderate, high, and severe myopia. All the data was collected and processed through SPSS 23.0 software. **Results:** Cumulatively out of 200 participants, 98 children had mild myopia, 87 had moderate myopia, 10 had high myopia and 5 children had severe myopia. Mild myopia was mostly prevalent in children of age limit 8-10 years, moderate myopia was mostly prevalent in children of age limit 11-13 years, while high myopia was mostly prevalent in children with age limit 14-16 years, and severe myopia was mostly prevalent in children of age limit 17-19 years. **Conclusion:** It is clear from the results that the most prevalent type of myopia in children is mild myopia and myopia severity increases with increase in children age. As the myopia is the most common type of refractive error in children and high myopia is a major risk factor of blinding ocular condition so, the myopia type and severity should be recognized as soon as possible in children and should be managed to control the progression of myopia.

Key words: Autorefractometer, Cumulatively, Myopia, Pathophysiology.

INTRODUCTION

Myopia or near-sightedness is the disorder of eyes in which instead of focusing on the retina the light focuses in front of the retina.¹ In myopia near vision is good while the distance vision is blurry, which also leads to headaches and eye strain. Myopia is associated both with the genetic and environmental factors and is associated with higher incidences of glaucoma, myopic macular degeneration, cataract, and retinal detachment.² The risk factors are excessive near work, less time spend outdoors and a positive family history of this condition.^{2,3} The pathophysiology of myopia is that either the eyeball is too strong for the refractive power of the eye or the crystalline lens has excessive power for the axial length of the eye.²

The degree of myopia is described in terms of diopters. Myopia of -3.00D or less is termed as low myopia, myopia of -3.00D to -6.00D is termed as moderate myopia and myopia of -6.00D or more is termed as high myopia.⁴

Myopia is the commonest refractive error in children and one of the most prevalent ocular condition worldwide with an estimation of 22.9% or 1.40 billion people are myopic and 2.7% or 163 million people are high myopic throughout the world.^{5,6} It is estimated that by 2050 about 49.8% of the world's population or 4.758 billion people will be myopic and 9.8% of the population or 938 million people will be high myopic globally.^{7,9} The prevalence and severity of myopia varies and depends on various variables like age, age

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Article received on: 23/08/2021
Accepted for publication: 11/11/2021

of onset, ethnicity, and country.⁸ It is clear from literature review that the mean annual myopia progression in Asian children is estimated to be $-0.82D$ which is slightly higher than the European children in which the mean annual myopia progression is about $0.55D$.¹⁰ If the myopia is left untreated then it would have an impact on the academic performance of children.¹¹ It is estimated that by 2060 the visual impairment in preschool children will increase by up to 26%, with uncorrected refractive error comprising 69% of the total cases.¹²

Many eastern Asian countries tends to be badly affected by myopia, where in some region prevalence of myopia in school age children is above 90%.^{13,14} Although, genetic factors play an important role in the development of myopia but the rapid increase in the prevalence of myopia could be attributed to the environmental factors and lifestyle changes of the individuals.⁶ Previous literature shows that there is an association between myopia and doing excessive near work in children like studying, reading, or using gadgets in near distance.¹⁵

MATERIAL & METHODS

This study was conducted to find out severity of myopia and its association with the age of children. The study population were the Children of age between 5 to 19 years who were received at the eye OPD in DHQ KDA teaching hospital Kohat from 1st of January 2021 to 1st June 2021 and the sampling technique was based on the purposive sampling. 200 patients were included.

Inclusion Criteria

All myopic children of age 5 to 19 years having refractive error correction of spherical equivalent of $-0.50D$ or above.

Exclusion Criteria

The children who are hyperopic, syndromic myopia, or having other ocular condition / pathology like corneal disorders, cataract, etc or have undergone any ocular surgeries that influences the refractive error were excluded from the study.

This was a descriptive, cross-sectional design of study that evaluated 200 patients. The age range was from 5 years to 19 years. The patients were enrolled from the hospital eye outpatient department. After obtaining ethical clearance (KIMS/Estt/497) and ensuring informed consent. A detailed history was elicited for symptoms like blurring of vision, headache, and eye strain. After that a general physical examination and detailed ophthalmic examination were performed. Uncorrected distance visual acuity of the patients was recorded through Snellen visual acuity chart. Then a Cycloplegic refraction was done after 45 minutes of the instillation of 1% cyclopentolate three times at 15-minute intervals. The cycloplegic refraction was done through autorefractometer and retinoscope to determine the most accurate refractive error possible and then the refractive error readings were recorded, the spherical equivalent of the refractive error was taken in astigmatic patients. The spherical equivalent refractive error was defined as the sum of the spherical and half of the cylindrical power. Myopia was defined as spherical equivalent refraction (objective) worse than -0.5 diopters (D). Based on degree of myopia at baseline, individuals were categorized as mild ($\leq -0.50D$ to $-3.00D$), moderate ($> -3.00D$ to $-6.00D$), high myopia ($> -6.00D$ to $-9.00D$) and severe myopia ($> -9.00D$).¹⁶

The data is entered and analysed through SPSS 26.0 software. Descriptive statistics tests were used to analyse the data.

RESULTS

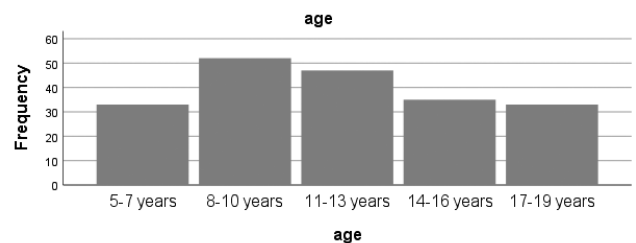


Figure-1

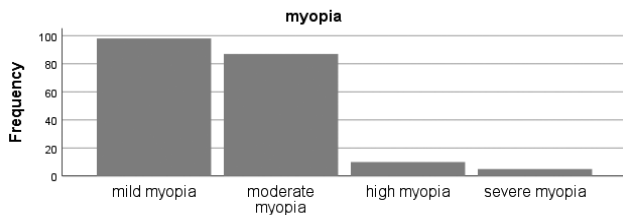


Figure-2

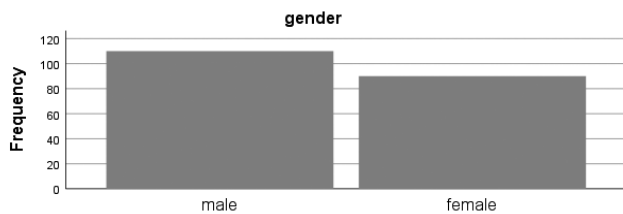


Figure-3

| | | Age | Myopia | Gender |
|------------------------|---------|--------|--------|--------|
| N | Valid | 200 | 200 | 200 |
| | Missing | 0 | 0 | 0 |
| Mean | | 2.92 | 1.61 | 1.45 |
| Std. Error of Mean | | .094 | .050 | .035 |
| Median | | 3.00 | 2.00 | 1.00 |
| Mode | | 2 | 1 | 1 |
| Std. Deviation | | 1.325 | .700 | .499 |
| Variance | | 1.757 | .490 | .249 |
| Skewness | | .158 | 1.154 | .203 |
| Std. Error of Skewness | | .172 | .172 | .172 |
| Kurtosis | | -1.111 | 1.608 | -1.979 |
| Std. Error of Kurtosis | | .342 | .342 | .342 |
| Range | | 4 | 3 | 1 |
| Minimum | | 1 | 1 | 1 |
| Maximum | | 5 | 4 | 2 |
| Sum | | 583 | 322 | 290 |
| Percentiles | 10 | 1.00 | 1.00 | 1.00 |
| | 20 | 2.00 | 1.00 | 1.00 |
| | 25 | 2.00 | 1.00 | 1.00 |
| | 30 | 2.00 | 1.00 | 1.00 |
| | 40 | 2.00 | 1.00 | 1.00 |
| | 50 | 3.00 | 2.00 | 1.00 |
| | 60 | 3.00 | 2.00 | 2.00 |
| | 70 | 4.00 | 2.00 | 2.00 |
| | 75 | 4.00 | 2.00 | 2.00 |
| | 80 | 4.00 | 2.00 | 2.00 |
| 90 | 5.00 | 2.00 | 2.00 | |

Table-I. Statistics.

| | | Count | | | | Total |
|--------|-----------------|--------|--------|----|----|-------|
| | | Gender | | 12 | 21 | |
| | | Male | Female | | | |
| myopia | mild myopia | 56 | 40 | 0 | 2 | 98 |
| | moderate myopia | 45 | 42 | 0 | 0 | 87 |
| | high myopia | 5 | 5 | 1 | 0 | 10 |
| | severe myopia | 4 | 3 | 0 | 0 | 5 |
| Total | | 110 | 90 | 1 | 2 | 200 |

Table-II. Myopia * gender Crosstabulation.

| | | Myopia | | | | Total |
|-------|-------------|-------------|-----------------|-------------|---------------|-------|
| | | Mild Myopia | Moderate Myopia | High Myopia | Severe Myopia | |
| age | 5-7 years | 23 | 9 | 1 | 0 | 33 |
| | 8-10 years | 31 | 19 | 2 | 0 | 52 |
| | 11-13 years | 16 | 29 | 1 | 1 | 47 |
| | 14-16 years | 14 | 16 | 4 | 1 | 35 |
| | 17-19 years | 14 | 14 | 2 | 3 | 33 |
| Total | | 98 | 87 | 10 | 5 | 200 |

Table-III. Count.

DISCUSSION

In this study out of 200 children 33 children were of age limit 5-7 years, 52 children of age limit 8-10 years, 47 children of age limit 11-13 years, 35 children of age limit 14-16 years and 33 children of age limit 17-19 years. The most children who participated in this study were of age limit between 8-10 years (Figure-1).

Out of 200 participants, 98 children had mild myopia, 87 had moderate myopia, 10 had high myopia and 5 children had severe myopia. (Figure-2). In literature it is stated that while the genetic causes play important role in the progression and severity of myopia, the environmental factors also contribute to the development of more severe myopia.¹⁷

Gender of the Participants

There was total 200 participants in this study out of which there were 110 male and 90 females. The youngest participant was of age 5 years while the oldest participant was of age 19 years (Figure-3).

Gender wise distribution of myopia

In this study out of 200 participants, 56 male and 40 female had mild myopia, 45 male and 42 female had moderate myopia, 5 male and 5 female had high myopia and 4 male, and 3 female had severe myopia (Table-II).

Age wise distribution of myopia

Mild myopia was mostly prevalent in children of age limit 8-10 years, moderate myopia was mostly prevalent in children of age limit 11-13 years, while high myopia was mostly prevalent in children with age limit 14-16 years, and severe myopia was mostly prevalent in children of age limit 17-19 years (Table-III and Figure-4). As it is clear from the above results that the mild myopia is the most prevalent type of myopia in children of age limit 5-19 years presented, and the severity of myopia increases with increase in age limit, although one study done in Taiwan shows that the myopia was more severe in younger than the above age group in Taiwan.¹⁸

CONCLUSION

As the age of the patient increases the severity of myopia also increases and because of which the risks of ocular complications due to myopia increases. As it has been observed in the study that some children had high and severe myopia in the younger age, such children have a high potential of progression of myopia with the increasing age and environmental factors has greater effects on it. So, it is advisable that as soon as the child is diagnosed with myopia, he/she should be managed properly, and some sort of myopia control intervention should be done so to prevent the severity of myopia with age.




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