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DIFFERENT OPTICAL MYOPIA CONTROL LENSES AND THEIR EFFECTIVENESS IN SCHOOL-GOING CHILDREN

Optometry

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ABSTRACT

Background: Myopia is rapidly increasing among school-going children and has become a major public health concern worldwide. Advanced optical interventions such as Defocus Incorporated Multiple Segments (DIMS) lenses and Highly Aspherical Lenslet (HAL) lenses have demonstrated promising results in controlling myopia progression.**Aim:** To evaluate and compare the effectiveness of different optical myopia control lenses in children aged 9–12 years.**Methodology:** A prospective comparative observational study was conducted among 200 myopic children aged 9–12 years. Clinical evaluation included cycloplegic refraction and axial length assessment. Statistical analysis was performed using SPSS software with One-Way ANOVA.**Results:** The DIMS group showed a mean SER progression of −0.30 ± 0.10 D and axial elongation of 0.15 ± 0.05 mm. HAL lenses demonstrated SER progression of −0.28 ± 0.12 D with axial elongation of 0.18 ± 0.05 mm, while single-vision lenses showed significantly higher progression. Statistical analysis showed highly significant differences between groups ($p < 0.001$). **Conclusion:** DIMS and HAL lenses significantly reduced myopia progression compared to conventional single-vision lenses. DIMS lenses demonstrated superior control over axial elongation and refractive progression.

KEYWORDS

Myopia Control, DIMS Lenses, HAL Lenses, Pediatric Myopia, Axial Elongation.

INTRODUCTION

Myopia is one of the most rapidly increasing refractive disorders globally and is highly prevalent among school-going children. Increased near work, prolonged screen exposure, and reduced outdoor activity are major contributing factors (Holden et al., 2016). Conventional single-vision lenses correct refractive error but fail to control axial elongation, which is responsible for progressive myopia.

Modern optical interventions such as DIMS and HAL lenses are designed based on the principle of peripheral myopic defocus, which helps reduce ocular growth and slow refractive progression (Lam et al., 2020). Studies have demonstrated approximately 50–60% reduction in myopia progression using these interventions (Bao et al., 2022).8m9

Methodology

A prospective comparative observational study was conducted among 200 school-going children aged 9–12 years diagnosed with myopia. Participants were divided into DIMS, HAL, and single-vision lens groups.

Clinical evaluation included:

Visual acuity assessment
Cycloplegic refraction
Axial length measurement
Slit lamp examination
Fundus evaluation

Statistical analysis was performed using SPSS software. Mean, standard deviation, and One-Way ANOVA were used for group comparison. A p-value < 0.05 was considered statistically significant.

RESULTS

The DIMS lens group demonstrated significantly lower progression of myopia compared to the single-vision lens group.

SER Progression:
DIMS: −0.30 ± 0.10 D
HAL: −0.28 ± 0.12 D
Single Vision: −0.60 ± 0.15 D
Axial Length Progression:
DIMS: 0.15 ± 0.05 mm
HAL: 0.18 ± 0.05 mm
ingle Vision: 0.30 ± 0.07 mm

One-Way ANOVA demonstrated statistically significant differences between groups ($p < 0.001$). The findings confirm that DIMS and HAL lenses significantly reduce refractive progression and axial elongation compared to conventional lenses.

DISCUSSION

The present study demonstrated that advanced optical myopia control lenses significantly reduced refractive progression and axial elongation in children aged 9–12 years. DIMS lenses showed the greatest effectiveness, followed by HAL lenses.

These findings are consistent with previous studies conducted by Lam et al. (2020) and Bao et al. (2022), which reported significant reduction in myopia progression using peripheral defocus-based optical interventions.

The mechanism behind these lenses is based on peripheral myopic defocus, which reduces the stimulus for ocular elongation and helps control myopia progression.

CONCLUSION

Advanced optical myopia control lenses are significantly more effective than single-vision lenses in slowing myopia progression among school-going children. DIMS lenses demonstrated superior effectiveness in reducing both spherical equivalent progression and axial elongation. Early diagnosis and timely intervention are essential for effective pediatric myopia management.

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