Introduction. To assess the role of supporting (biomechanical) properties of the sclera in postnatal period of refractogenesis and myopia development, we need to study these properties in children with various clinical refractions.

Purpose: To study the biomechanical features of the corneoscleral shell of hyperopic and myopic eyes in children.

Material: 58 children (116 eyes), including:
- 33 children (66 eyes) aged 7–16 with myopia from –0.5 to –10.75 D;
- 25 children (50 eyes) aged 6–13 with hyperopia from +1.5 to +11.0 D.

Methods:
- Ophthalmologic examination, including autorefractometry.
- Pachymetry: central corneal thickness (CCT) measurement.
- Ultrasound biomicroscopy: axial length (AL) measurement.
- Acoustic density of the equatorial and posterior sclera (ASD) measurement.

This was done using a multifunctional ultrasound diagnostic machine Voluson 730 Pro (with a linear frequency sensor ranging from 10 to 16 mHz), which performs digital analysis of ultrasound tissue histograms (Fig. 1). In the grey scale B-scan, a horizontal section of the posterior segment of the eyeball was passing through the optic nerve. The sclera was visualized as hyperechogenic lines. All images were analyzed at the same distance from the optic disc: for any area of interest, numerical parameters and densitometric indices were registered with diverse magnifications as conventional units of ultrasound digital image analysis.

- Biomechanical parameters - Corneal Hysteresis (CH) and Factor of Corneal Resistivity (FCR) measurement using Ocular Response Analyzer (ORA, Reichert, USA) (Fig. 2).

Results

Ultrasound Examination Results

Although central corneal thickness (CCT) is practically the same in both groups, biomechanical parameters of the eyes with hyperopia and myopia are different (Table 1). We found CH to be reliably lower (P<0.05) in moderate and high hyperopia (respectively 10.8±0.4 mm Hg and 10.5±0.3 mm Hg) than in low myopia (12.3±0.2 mm Hg) as well as myopia of all degrees, on the other hand, is significant.

As the refraction grows, the acoustic density of the sclera is significantly subsiding, especially in the equatorial area: from 233±1.76 units in the posterior pole and 230±1.23 units in the equatorial area for high hyperopia to 215±1.13 units and 209±1.15 units, respectively, in high myopia (Table 3).

Conclusions. The significant reduction of CH and ASD that takes place with the increase of myopic refraction is primarily accounted for by damaged biomechanical properties of the sclera. The results enable us to state that moderate and high hyperopia is a specific condition that has distinctive biophysical features of the corneoscleral eye shell. The disturbance in sclera biomechanics is a triggering factor of eye growth and refraction increase in children.
**Introduction.** In recent years, orthokeratology has established itself as a method of correction and control of myopia progression in children. However, according to our data, 19.6% of patients showed such progression over an average of 4.2 years of observation, while axial length increased by more than 0.3 mm.

**Purpose:** To develop a pattern of combined sclera-strengthening treatment and OK correction of rapidly progressing myopia in children.

**Material and Methods.** 25 children (33 eyes) aged 9–12 (averagely, 10±1.3 years) with myopia from -2.5 to -6.5 D (averagely, -5.0±0.9 D) received combined treatment. Before starting the treatment, all children were examined for acoustic density of the sclera (ADS), which was determined from scleral histograms obtained using an ultrasound device, Voluson 730 Pro. If ADS values were lower than 215 units in the posterior pole and lower than 210 units in the equatorial area the first phase of treatment was scleroplasty. In the case of axial length (AL) < 26.0 mm and ADS > 205 units, low invasive scleroplastic surgery (LISS) was performed. If AL ≥ 26.0 mm and ADS < 205 units, bandaging scleroplastic surgery (BSS) according to Snyder-Tompson technique was performed (Table 1). To determine when the patient could start wearing OK-lenses, the patients were tested for the condition of tear production and tear film using Schirmer and Norn tests before and 1 week, 1 month and 2 months after the surgery. Myopia progression was controlled according to the dynamic of AL.

**Results.** Tear film breakup time (TFBT) and Schirmer test values changed after the surgery and gradually recovered, which required 1 month after LISS and 2 months after BSS. Thus, wearing of contact lenses, including OK lenses, may be recommenced 1–2 months after extrascleral surgery, including scleroplasty. Over the period of 1–3 years after the surgery, no myopia progression or AL elongation were noted (Table 2). In the fellow eyes of 7 patients, 1–2 years after the surgery, axial length grew by 0.3 mm or more, in which case scleroplasty was administered. For this purpose, wearing of OK lenses was suspended; after the anatomical and optical parameters of the cornea stabilized (in 1–2 weeks as a rule), scleroplastic surgery was given, whereupon, 1.5 months later, wearing of OK lenses was resumed.

**Conclusions.** For patients with rapidly progressing myopia and low acoustic density of the sclera, the combined treatment pattern consisting of scleroplasty followed by OK lens wearing could be recommended. Scleroplastic surgery does not impede the use of OK lenses after that.
Prevalence of Myopia Among Hong Kong Chinese Schoolchildren

Lily YL Chan\textsuperscript{1,2}, Chin-hang Lam\textsuperscript{1,2}, Sam CK Cheng\textsuperscript{1}, Gary KY Fung\textsuperscript{1,2}, Carly SY Lam\textsuperscript{1,2}

1. Centre for Myopia Research, School of Optometry, The Hong Kong Polytechnic University, Hung Hom, Hong Kong SAR, China
2. The Hong Kong Jockey Club Sports Medicine and Health Sciences Centre, Faculty of Health and Social Sciences, The Hong Kong Polytechnic University, Hung Hom, Hong Kong SAR, China

Introduction

Studies have documented increasing prevalence of myopia among Asian countries within the past two decades especially in urbanized areas such as Taiwan\textsuperscript{1}, Japan\textsuperscript{2} and Malaysia\textsuperscript{3}. This study aims to determine the prevalence of myopia and its current trends among the Chinese schoolchildren in Hong Kong.

Methods

Six local primary schools were selected in a multi-disciplinary health screening program during the period of 2005 to 2010. LogMAR visual acuities and binocular status were assessed under our participants’ habitual refractive condition. Refractive error and ocular biometry were measured under non-cycloplegic conditions with an open-field auto-refractor (Shin-Nippon NVision-K 5001, Ryusyo Industrial Co. Ltd, Osaka, Japan) and IOLMaster (Zeiss Inc. Meditec-AG, Jena, Germany) respectively. Hyperopia was defined as a spherical equivalent refraction (SER) >0.50D, emmetropia as SER between -0.50D and +0.50D (inclusive) and myopia as SER < -0.50D as a definitive comparison of SER with our previous study.

Results

Data of refractive error, axial length and keratometry from 2725 schoolchildren, 5 to 15 years of age (mean age=9.03±1.89, 53% boys, 47% girls) were analyzed after exclusion of subjects with strabismus (n=104), of non-Chinese ethnicity (n=11), incomplete dataset (n=30) and presence of ocular or systemic conditions (n=13). Only data from the right eye was presented as data between left and right eyes were highly correlated (Pearson r=0.930 for SER, p<0.001). The mean SER for this population was -1.02±1.71D, ranging from +6.94 to -10.00D. Data from schoolchildren of age 5 and 13 or above were further excluded as the sample size (n=75) was of weak statistical value. The mean age of the stratified sample (age 6-12 years, n=2651) was 8.92±1.77 with a mean SER of -1.02±1.70D. Figure 1 shows the frequency distribution of age and gender of our sample population.

Discussion and Conclusions

1. The prevalence of myopia among the Chinese schoolchildren population in Hong Kong are similar to our previously reported values from 19 years ago\textsuperscript{4} with as high of a prevalence value as those reported by other Asian countries during the early 1990s\textsuperscript{1,2} (Fig. 3).
2. The prevalence of myopia increases with increasing age (Pearson r=-0.3000, p<0.001). This trend is similar to our previously reported findings\textsuperscript{4} (Pearson r=-0.3302, p<0.001) despite differences in the sampled population.
3. Our findings do not support the concurrent trends as observed in other Asian countries where there is a reported increase in myopia prevalence. It is postulated that myopia prevalence among Hong Kong schoolchildren may have reached a “saturated” level as observed in Taiwan where prevalence of myopia was reported to have stabilized in 2005\textsuperscript{5} (Fig. 3).

Figures

Figure 2 illustrates prevalence of refractive errors among the six-year-old as compared to the twelve-year old age categories. Mean SER rose from -0.06±1.03D at age six to -1.67±1.94D by the age of twelve years. No gender differences were found in SER (Mann-Whitney test, U=886300, p=0.064) but boys (49.5%) had a slightly higher prevalence in myopia than girls (46.2%) (χ²=8.727, df=2, p=0.013). Both prevalence of myopia (χ²=272.217, df=12, p=0.001) and SER (Pearson r=-0.317, p<0.001) were associated with age. Prevalence of high myopia (SER of more than -6.00D) in this population group was 1.8% with an increase from 0.7% at age six to 3.8% by the age of twelve years.

References

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Acknowledgement

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Twelve Years Later: Has the Rate of Myopia in Singapore Deteriorated?  
Pei Ying Chua1, Adeline Yang1, Sheng Tong Lin1, Frederick Tey1, Gerard Nah2, Seang Mei Saw3  
1DSO National Laboratories; 2Republic of Singapore Air Force, 3National University of Singapore

INTRODUCTION

A myopia cohort study was conducted on military conscripts from April 2009 to April 2010. The aim was to compare the current trend of myopia with that of 12 years ago (Wu et al., 1998).

RESULTS (1):

The prevalence of myopia, severe myopia, and astigmatism has generally increased across all races over the last 12 years (P<0.01 for all except severe myopia in Indians). Anisometropia has increased for Chinese and Malays only (P<0.01).

RESULTS (2):

The prevalence of myopia, severe myopia, and astigmatism has generally increased across all education levels over the last 12 years (P<0.01 for all except myopia and severe myopia for tertiary education). Anisometropia has increased for secondary education only (P<0.01).

RESULTS (3):

As reported by Wu and colleagues (1998), ethnic differences persisted even after adjusting for education. The PRR remained highest in Chinese, although there was significance observed for severe myopia in Indians.

CONCLUSIONS

1) The prevalence of myopia and astigmatism in Singapore has generally increased over the last 12 years.  
2) The effects of ethnicity are still very strong, even after controlling for confounding factors such as education.

REFERENCES


CORRESPONDENCE

For more information, please contact Adeline Yang Huixian (yhuixian@dso.org.sg) or Pei Ying Chua (cpeiyjing@dso.org.sg).
A Cohort Study of Myopic Refractive error progression in Korean children myopes

Jae Do Kim, Ikhun Lee, Changsun Lee, Taehyun Kim
1 School of optometry, Kyungbuk Science University, Kyungbuk, Korea, 2 School of optometry, Kundong University, Kyungbuk, Korea

Purpose

- Myopic refractive error and prevalence of myopia increase with age increase in school children specially in Asia. 
- The increasing rate of the myopic refractive error and myopia prevalence among the Korean children students were 0.2D and 5.3% respectively. 
- To determine myopic refractive error in an optometric clinic-based cohort study in Korean children.

Subjects and methods

Subjects

- Data were available for 99 Korean children (male: 55, female: 44) who had myopic refractive error in Korean cohort study of myopic refractive error change. 
- A mean 33 ± 8 months cohort study was conducted in Korean children aged 4 years 11 months to 16 years 2 months at first visit.

Methods

- Refractive errors were measured using Shin Nippon N-vision 5500 under non-cycloplegic every mean 6 months. 
- Spherical refractive error and astigmatism data were used separately for this study. 
- Refractive error results are presented for the right eye of each subject.

Results

Spherical Myopic Refractive error Change

- Mean myopic refractive error increase -1.80D to -3.43D (paired t-test; p < 0.001) for 33 months and the rate of increase was 0.063 D per month (0.76D/year) (Fig.1).

Astigmatism Change

- Astigmatism increased -0.43 D to -0.71D for 33 months (paired t-test; p < 0.001) (Fig.2).

Refractive error increase with onset age of myopia

- Refractive error is the more increase the earlier onset 
- Refractive error increase was 
  - 0.085D per month for 6 years old of onset 
  - 0.068D per month for 9 years old of onset 
  - 0.056D per month for 11 years

Discussion and conclusion

The average annual myopic refractive error change for children with myopia was very high in Asia. This results also show that the rate of myopic refractive error progression for myopic children in Korea is higher than for myopic school children in other Asian countries. And this cohort study results show higher average annual myopic refractive error change with myopia than non-cohort study in children in Korea.

References

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E-mail: 1. jaedokim@yahoo.com, 2. i4ucye@naver.com
Background

Allergies such as rhinitis and eczema are common among Hong Kong children. Sometimes severe allergic conditions may cause problems in ocular tissues such as papillae and corneal staining that may affect contact lens wear. Clinical trials of myopia control using contact lenses have become more popular (e.g. Ortho-K lenses and bilocal soft lenses) in recent years. External ocular health (EOH) is one of the concerned issues in prescribing contact lenses for young children in myopia control studies.

Purpose

To evaluate the presence and severity of papillae and corneal staining among Hong Kong myopic schoolchildren in order to provide a reference for fitting contact lenses to young children in myopia control clinical trials.

Methods

Myopic children aged between 8 and 13 year-old were recruited for a 2-year myopia control study with soft contact lens since November 2007. Those children had not worn contact lenses before. Slit-lamp biomicroscopy was performed on each subject to examine their EOH in order to provide a reference for selecting suitable candidates for myopia control study using contact lenses. Cornea and Contact Lens Research Unit (CCLRU) grading scales were used for grading the severity of corneal and palpebral conditions, i.e. central and peripheral corneal staining; papillae at upper and lower palpebral conjunctivae. The parents were also surveyed to assess the prevalence of allergic problems (eczema, asthma and rhinitis) among children.

Results

A total of 781 schoolchildren were evaluated. Peripheral corneal staining (45.6%) were more common than central staining (7.6%). Among the children with corneal staining, 13.8% and 25.4% of them showed moderate to severe (grade 2 or above) peripheral and central staining respectively. About one-tenth of the subjects had trichiasis. 37.3% and 17.4% of them also had accompanied peripheral and central corneal staining respectively. Papillae were found to be very common in both upper (84.0%) and lower (84.4%) palpebral conjunctivae. About two-thirds of the subjects (67.5%) had papillae with grade 2 or above at lower palpebral conjunctivae whereas about 39.1% at upper palpebral conjunctivae.

Figure 1 shows the typical features observed among the schoolchildren, including papillae and central corneal staining. Figure 2-5, show the percentage of different grades of corneal staining and papillae. 40% of children had allergic rhinitis as reported by their parents; 11.5% of those children required medications to relieve the symptoms and about 20% of them complained about itching eyes.

Conclusions

Papillae are common ocular allergic problems in Hong Kong schoolchildren, and are highly associated with allergic rhinitis. Contact lenses wear in young children needs to be cautious in particular if they already present signs of ocular allergy.

References


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Suggestions for a new classification of myopia

Yang zhikuan*, Lan weizhong, Ge Jian
State Key Laboratory of ophthalmology, Zhongshan Ophthalmic Center,
Sun Yat-sen University, China

*Correspondence Email: zocyang@yahoo.cn

Purpose

To propose a new classification of myopia in order to facilitate the clinical management for myopia.

Congenital Myopia is an myopia that presents at the birth or at the early age, which is hereditary (solely gene-related) and incurable at present.

Symptomatic Myopia is the myopia that presents as one symptom of some primary diseases, such as diabetes, Mafan Syndrome and cataract. The refractive error of this kind of myopia can be obviously eliminated or fully reversed when the primary disease is treated properly.

Induced Myopia refers to the one that is related with external factors, mainly environmental ones. This myopia usually appears in school-age children or in young adults. It is worth paying the most attention to and urgently needs solutions to be cured.

Background and Methods

A variety of systems, based on different methods, have been applied for the classification of myopia in the past literature, such as congenital vs. youth-onset, physiological vs. pathological, hereditary vs. environmentally induced, stationary vs. progressive, axial vs. refractive. However, there is a lack of system which facilitates the clinical management of the disorder in the daily practice.

A systematic literature review on the myopia classification used in the last 50 years was performed and a new classification, from the clinical management’s point of view, is proposed accordingly.

Results

Myopia is proposed to be classified into Congenital Myopia, Symptomatic Myopia and Induced Myopia.

Conclusion

Myopia is proposed to be classified into three categories: congenital myopia, symptomatic myopia and induced myopia. Such a classification system may help better management for patients clinically.

Statement of proprietary interests: None
**STUDY OBJECTIVE**

The case explores whether bifocal contact lenses can be used to stimulate axial elongation in axial hyperopia by altering the prescribed powers to impose myopic defocus.

**BACKGROUND**

Myopia has become the focus of growing attention and concern because the prevalence of myopia appears to be increasing in some populations, reaching 90% in some university student populations in Asia. A “drastic increase” in the prevalence of myopia and attempts to reverse both central myopia and refractive progression is that which influences the increasing scale growth. Emerging optical treatments are existing to show many levels of success in inhibiting myopia progression. While these treatments include such varied approaches as progression-inhibiting lenses, bifocal contact lenses, axial elongation in axillary hyperopic defocus, it may be possible to utilize them to stimulate the retina (imposed myopic defocus), it may be possible to test the possibility that axial elongation in a child with axial hyperopia by altering the prescribed powers to impose hyperopic defocus. An axially hyperopic eye exposed to hyperopic defocus will act like a negative add zone, thus exposing the retina to imposed hyperopic defocus. An axially hyperopic eye exposed to hyperopic defocus.

**METHODS**

C.R. was ten years old upon presentation for her eye examination. She had a history of high levels of hyperopia and had undergone brief periods of occlusion therapy. While it cannot be said that her refractive changes and axial elongation occurred as a result of the prescribed bifocal contact lenses, she carried a history of the proposed bifocal contact lenses. A more formal one year double masked randomized trial comparing “anti-hyperopia” vs. “wait and see” would be required to prove the hypothesis. Similarly, her axial elongation over two years was quite comparable to the population of similar age. Similarly, her axial elongation in a child with axial myopia could be induced with a contact lens providing myopigenic stimulus. It can be argued that human systems conserve energy, thus to lessen accommodative effort during distance viewing as well. To encourage this double stimulus to growth, it may be advanta-geous to prescribe the distance power low enough to encourage use of the near portion for vision. However, if the power on the near portion was too high, the overall hyperopic defocus would be so high as to interfere with binocular vision. Such a study should be conducted to study the accommodation responses of hyperopic eyes, especially those with high hyperopia.

While it would be inappropriate to conclude anything from a single case report, the refractive and keratometric data suggests that the bifocal contact lenses might have induced some changes in the eyes of this particular subject. A more formal study would be required to prove the hypothesis.

**RESULTS**

- **Changes in refraction**
  - Chart shows changes in refractive error with bifocal contact lenses prescribed in a manner intended to stimulate axial elongation in hyperopic defocus.
  - Lenses inserted in the left eye to impose myopic defocus.

- **Changes in Axial Length**
  - Chart shows changes in axial length from before bifocal contact lens wear and during two years of main bifocal contact lens wear.
  - Axial length change from before bifocal contact lens wear to after bifocal contact lens wear.

- **Change in Hyperopia with and without BCL**
  - Chart shows change in hyperopia during bifocal contact lens wear and during two years of main bifocal contact lens wear.

**DISCUSSION**

The case explores the refractive, keratometric and axial length changes in a 10 year old hyperopic girl wearing bifocal contact lenses prescribed in a manner intended to stimulate axial elongation in a child with axial hyperopia. The final two years were periods during which C.R. only rarely wore single vision reading glasses. The patient may use the near add to read, thus easing the accommodative demand. If this is the response, then while reading, the retina would be exposed to imposed hyperopic defocus. A more formal one year double masked randomized trial comparing “anti-hyperopia” vs. “wait and see” would be required to prove the hypothesis. A more formal one year double masked randomized trial comparing “anti-hyperopia” vs. “wait and see” would be required to prove the hypothesis. Such a study should be conducted to study the accommodation responses of hyperopic eyes.

**REFERENCES**

Three year longitudinal follow-up data on a clinical trial of the efficacy of multifocal contact lenses for myopia control

Edwin Howell
School of Optometry & Vision Science, University of NSW, Sydney, Australia

Purpose
To follow the progress of a clinical trial of the efficacy of multifocal soft contact lenses compared to multifocal spectacle lenses for myopia control.

Introduction
The peripheral blur model of myopia progression suggests that the peripheral retina should be maintained in clear focus or slightly myopic compared to the fovea. As myopic eyes tend to be more prolate in shape, the relatively hyperopic trend in the periphery would require over-plus ‘correction’ to stabilise the refraction while a minus correction is required for the central myopia.

Multi-focal spectacle lenses have been shown to slightly reduce the progression of myopia. (Leung & Brown 1999, Gwiazda et al 2003). In multifocal spectacle lenses, the plus add is in the lower field only.

Multi-focal contact lenses offer the possibility of a plus add in the whole visual field. Bifocal concentric multizone contact lenses have been shown to reduce the progression of myopia. (Aller 2000, 2008). A preliminary report of this trial was presented at the previous IMC conference in Cairns (Howell 2008).

Methods
Progressing myopic children less than 16 years of age were +1.50 add multifocal spectacle lenses for at least 1 year and then were fitted with distance centre +1.50 add multifocal soft contact lenses. Some of these children have now been followed for greater than 3 years of contact lens wear.

All subjects were private optometric clinic patients. Refraction was assessed using a free-space autorefractor (Shin-Nippon NVision-K 5001) & subjective minimum minus to optimum acuity.

All subjects were prescribed multi-focal spectacle lenses (+1.50 D add). All were followed regularly for at least 12 months. Some children showed a decrease in the progression of myopia while wearing multi-focal spectacles & have NOT been included in this study.

Those that were still progressing significantly after at least 12 months were offered contact lenses as an alternative to the spectacles & form the subjects for this study. Each subject acts as their own control for the CL efficacy compared to spectacles.

Multi-focal Spectacles Zeiss/SOLA MC Myopia Control lenses. Short corridor progressive lens +1.50 add

Multi-focal contact lenses. Cooper Proclear ‘D’ Multifocal disposable daily wear contact lenses. Minus centre / Plus surround +1.50 D

Results

<table>
<thead>
<tr>
<th></th>
<th>Previous 12 months wearing multi-focal glasses +1.50 add</th>
<th>Following 12 months wearing multi-focal C/L +1.50 add</th>
<th>Second 12 months wearing multi-focal C/L</th>
<th>Third 12 months wearing multi-focal C/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progression of myopia D / Annum</td>
<td>-0.54 ±0.17 D</td>
<td>-0.18 ±0.2 D</td>
<td>-0.14 ±0.15 D</td>
<td>-0.14 ±0.12 D</td>
</tr>
<tr>
<td>n=21</td>
<td>n=21</td>
<td>n=16</td>
<td>n=10</td>
<td></td>
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<tr>
<td>p&lt;0.001</td>
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</table>

Conclusions
Distance centre (plus add surround) multifocal soft contact lenses (-0.18 D/annum) would appear to significantly reduce the myopia progression compared to multifocal spectacle lenses (-0.54 D/annum). This contact lens efficacy was maintained over the three years of the current clinical trial. No ‘rebound’ increase in myopia progression has been observed.

Significantly less progression of myopia with multi-focal contact lenses compared to multi-focal spectacles in the same subject. (Note: The progression rate of -0.54 D/Annum for MF glasses does not necessarily reflect the ‘typical’ glasses efficacy as stabilised “successful” MF glasses patients were excluded from this study).

The data is consistent with a model that ‘myopic blur’ on the whole peripheral retina relative to the fovea is more likely to be refractively stable.

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Commercial Interest
None
No sponsorship.
Respective lens suppliers were not aware of the nature of the clinical trial

For further information
Please contact e.howell@unsw.edu.au
Howell Croucher Bateau & Associates, Optometrists
204 Canterbury Road
Heathmont Vic 3135
AUSTRALIA
Clinical Performance of Defocus Incorporated Soft Contact (DISC) Lenses for Myopia Control
Carly SY Lam, Wing Chun Tang, Ying Yung Tang, Dennis Y Tse, Chi Ho To
Centre for Myopia Research, School of Optometry, The Hong Kong Polytechnic University

Background
The Defocus Incorporated Soft Contact (DISC) lens is a custom-made multi-zone bifocal (interzone power difference: 2.5D) soft contact lens which simultaneously provides clear vision and defocus at all viewing distances. It comprises of correcting zones for correcting the distant refractive error, and defocusing zones to incorporate constant myopic defocus in order to slow down eye growth and myopia progression.

Purpose
To compare the clinical performance of a specially designed DISC lens with traditional contact lenses.

Methods
Thirty-two myopic (-1 to -5D, with astigmatism less than 1D) Hong Kong Chinese schoolchildren aged between 9 to 15 years were recruited. They were randomly selected from the subject pool of our on-going ‘myopia control study’ using the DISC lenses. Half of the subjects wore the DISC lenses and the other half wore single vision (SV) contact lenses of the same material. Lens evaluation was performed for each subject after 30 minutes of lens wear. Clinical performance of the lens was assessed for their right eyes in terms of lens fitting (centration, primary gaze movement, movement with blink, lens tightness)\(^1\), physiology parameters (limbal and bulbar redness, corneal and conjunctival staining)\(^2\), Subjective perception of comfort and vision quality (ratings of grade 1-5 ) of each subject were also collected. Assessments on visual performance included: distance visual acuities (VA) under different contrasts (100%, 25%, 10% and 5%) in photopic and scotopic conditions, near VA at high contrast and low contrast. Each subject was given a break and then switched to wear the other lens type on the same eye. Measurements were repeated after 30 minutes of lens adaptation. Paired t-test was used for statistical analysis.

Results
Lens fitting performance, physiology parameters and subjective perception of lens comfort were very similar for both lens types (p>0.05). Overall satisfaction of vision with lenses was graded by the subjects on a scale from 1-5 (1-very poor, 2-poor 3- fair; 4-good, 5-excellent). The mean grades for both lens types were good (DISC lens = 4.13, SV lens = 4.81) although some of the subjects reported slightly better vision with SV lenses than the DISC lenses. There was no statistical significant difference between two lens types in high contrast near VA (p = 0.325), but a significant difference was showed in low contrast near VA (p<0.0001) (Figure 1). The mean differences of low contrast near VA were 0.07 and 0.1 logMAR units (3 letters to 1 line) under photopic and scotopic conditions respectively. The distance VA of various contrast levels was significantly better for SV lens than the DISC lens under both photopic and scotopic conditions (Figure 2).

Conclusions
The DISC lens shows similar clinical performance as single vision lens in most aspects except low contrast VA. Overall performance indicates that the DISC lens can be prescribed for schoolchildren.

References

Acknowledgement
RGC GRF (B-Q04G) and Niche Areas Fund (J-BB7P) from The Hong Kong Polytechnic University.
A patent ‘Method of Optical Treatment’ (US patent no. 7506983) was issued on 24 Mar 2009.