Optical contributions to blur sensitivity variance in refractive error groups
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Background: The depth of focus of the eye has been shown to be larger in myopes than emmetropes 1,2 and this reduced sensitivity to blur has been proposed as a source of greater accommodative lag in myopes 3,4. 

Aim: To investigate how perceptual demand in the test target affects blur sensitivity in myopes and whether this is affected by optical aberrations.

Methods: Blur sensitivity was assessed in the right eye of 23 participants following cycloplegia. Wavefront aberrations were assessed with the COAS aberrometer and objective refractive error with the Shin-Nippon SRW5000 auto-refractor. Targets were presented via a Badal optometer with participant viewing through a 5mm artificial pupil. Three types of targets were used (figure v1.) : those that required low (resolve sinusoidal grating), moderate (recognise letters in a high contrast grid of Snellen letters) and high (read a block of high contrast Times New Roman print) perceptual demand.

The resolvable components of each target were equivalent to 10c/deg at the viewing distance. Participants reported first noticeable blur (letters and text) and when the targets became non-resolvable.

Results: Participants were divided into three groups based on refractive error; emmetropes, n=7; low myopes, n=9, 1.50 to 4.50D; high myopes, n=7, > 4.50 to 9.00D. Myopes showed significantly worse blur sensitivity than emmetropes for first noticeable blur (ANOVA: F(22,2) =5.3, p=0.014) and when it became non-resolvable (ANOVA: F(22,2) =3.7, p = 0.044) as shown in figure 2.

The point where targets became non-resolvable was significantly correlated with refractive error for all target types (grating: r = 0.451, p = 0.031; letter: r = 0.436, p = 0.037; text: r = 0.472, p = 0.023).

Blur sensitivity with the text target was significantly correlated with refractive error (r = -0.545; p = 0.08) and third order Zernike aberrations 3,3 (p<0.05) 3-3 (p=<0.05).

Multiple regression analysis retained refractive error and the aberration Z3,3 (horizontal trefoil) as significant (refractive error: beta = 0.521, p = 0.002; Z3,3: beta = 0.520, p = 0.002)

Conclusions: Blur sensitivity decreased with increasing myopia for each target type. Greater perceptual demand increased blur sensitivity, with only a small difference between moderate and high perceptual demand targets. Ocular aberration contributed most to blur sensitivity for the most perceptually demanding target.

References

Fig 1. Sinusoidal grating, letter grid and text block targets.

Fig 2. Mean depth of focus for three refractive error groups.

Fig 3. Mean depth of focus for each target and refractive error group.

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Poster #22
AQ4 Expression and Retinal Edema During Recovery From Form Deprivation Myopia
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Purpose

• Aquaporin (AQ4) function in transporting water in mammalian epithelia and endothelia and are specifically involved in facilitating fluid secretion and absorption in the eye. Five of the 15 aquaporins were found to be expressed in the eye, the most important is AQ4 which is expressed in ciliary epithelium and retinal Muller cells and is involved in retinal signal transduction (Verkman, 2005).

• Clinical and experimentally induced form deprivation myopia (FDM) characteristically shows an increase in ocular volume (edema), axial elongation, decreased choroidal and retinal thickness, and decreased choroidal blood flow. Immunohistochemical and electron microscopy show changes in retinal abnormalities and consequential alteration of the retina, RPE and choroid. This suggests changes in rate of non-ocular driven trans-retinal fluid movements from vitreous to choroid (Crewther et al., 2005).

• In the chicken, studies have demonstrated that light-induced shifts in the rate of fluid movements would be accompanied by an up-regulation of aquaporins, in particular aquaporin 4 (AQ4) with time of recovery.

Method

• Eighteen cockerel chicks were utilised. Twelve chicks were form deprived from day 3-11 by placing a translucent occluder on their right eyes. After occluder removal, animals were given normal visual experiences for 0 hrs, 24 hrs and 36 hrs on left eyes were used as a within subject control. Two No Lens chicks were used as age-matched controls for each time point of recovery from form deprivation.

• At 0, 24 and 36 hrs post-ocular siphoning, chicks were anaesthetised with ketamine followed by a sodium pentobarbitone solution. After corneal slits were made, the eyes were perfused with PBS (1.3 grams/litre NaCl) in order to maintain the vitreous chamber. Eyes were then mounted on glass slides and a coverslip was placed on the cornea. The eye was examined using an upright fluorescent microscope (Nikon Eclipse TE300). The MCD-concentrated staining method was used to visualise the relative concentration of protein bands after subtracting the background and the autoradiographic film. Quantification of AQ4 was by ratio of relative optical density (ROD) of AQ4 to actin.

Results

• With respect to the shape of AQ4 protein expression curve, there was a clear correlation between the expression of AQ4 and the experimentally induced form deprivation myopia. The results show that AQ4 expression increased significantly with time of recovery compared to the age-matched controls at p<0.05 significance. Note: nl = no lens, FDM = form deprivation myopia/form deprived, RE = right eye and LE = left eye.

Conclusion

• AQ4 expression increased over the recovery period and showed greatest abundance in FDM eyes at 36 hours compared to fellow and control eyes.

• Analysis of the AQ4 water channel in FDM eyes at 36 hours recovery produced 3 monomeric bands. These new monomeric forms of AQ4 with translational isomers at the first Methionine (M1) and second Methionine (M2). The M2 isomer has not yet been identified as functionally different; however the M2 isoform at t=3 hrs FDM was absent (Furman et al., 2003) and had the same actin ratio as the control (Neeley et al., 1999). The M2 isoform forms highly stable square arrays with abundant cross-bridges that facilitate optimal, fast, effective water transport across the blood-brain barrier (Beebe et al., 2006). These box proteins are suggested to be implicated in the membrane organization of many channel proteins such as potassium channels and forming complexes with them (Nagelhus et al., 1998, Neeley et al., 1999). During brain injury such as cerebral ischemia, these array disassemble, leading to water retention and edema (Furman et al., 2003).

• Recent studies have suggested that AQ4 is the principal protein which binds to the sodium transport proteins and which is indicative of their role in edema formation as well as absorption of excess fluid in the brain (Kass et al., 2006). This mechanism of water regulation is said to be associated with potassium uptake which is crucial for synaptic transmission and normal neural processing (Neill et al., 2006).

• The results suggest that an initial pathology is involved in the involvement of AQ4 in water transport across the BBB and during edema formation following recovery from FDM.
Variation in Nasal-Temporal Asymmetry in Refractive Error Groups

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Background: It is known that the peripheral field of myopes is hyperopic. What is less well known is how this is affected by the magnitude of the refractive error and whether there are variations in nasal-temporal asymmetry.

Aim: To examine the influence of refractive error magnitude on the direction and symmetry of peripheral refractive errors.

Methods: Refractive error was assessed at peripheral retinal locations in 35 subjects, using the Shin Nippon SRW5000 auto-refractor. Measurements were obtained for central and 5,10, 15, 20 and 30° eccentricity in nasal and temporal retinas. Spherical equivalent, \( J_{180} \) astigmatism and sagittal and tangential power components were calculated, normalised to central refraction. Subjects were divided into four groups: Group1, n=13, emmetropic; Group2, n=9, <4.00D; Group3, n=8, 4.25 to 6.25, Group4, n=5, >6.50D.

Results: Peripheral shape profiles differed significantly between groups. In the temporal retina, hyperopia increased with increasing myopia (figures 1-4). Emmetropes showed significantly more myopia at 30° temporally (ANOVA: \( F_{(31,3)} = 8.9, p < 0.001 \)). Temporal refraction was significantly negatively correlated with refractive error (Pearson: \( r = -0.633, p < 0.001 \)). Nasal refraction did not show consistent change in shape profile with increasing refractive error. At 30° nasal, high myopes showed significantly more myopic refraction than other myopic groups, but did not differ from emmetropes (ANOVA: \( F_{(31,3)} = 9.4, p =0.001 \). Nasal peripheral refraction was not correlated with central refractive error.

Asymmetry (nasal 30°- temporal 30°) was significantly different for high myopes compared to the three other groups (ANOVA: \( F_{(31,3)} = 6.5, p =0.002 \)).

Conclusions: Nasal-temporal asymmetry differed significantly between refractive error groups with the highest myopes differing significantly from all other refractive error groups. These naso-temporal asymmetries need to be taken into account in contemporary hypotheses which assume peripheral hyperopic defocus as a stimulus for myopisation. Potential corrections for the periphery should be prescribed accordingly.

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DISTRIBUTION OF AXIAL GROWTH RATES IN MYOPIC CHILDREN AGED 7-13 YEARS

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AIM: Treatment with the adenosine receptor antagonist 7-methylxanthine effectively reduces the abnormally high axial eye growth rate in childhood myopia. The treatment is safe and without side-effects, and may be continued until 18-20 years of age when age-related cross-linking of collagen prevents further elongation of the eye. However, some myopic children have a normal axial growth rate and may therefore not need treatment. The aim of the study was to estimate how big a percentage is included in this category.

METHOD: As part of a clinical trial (www.clinicaltrials.gov Reg.NCT00263471), 205 children aged 7-13 years with a cycloplegic myopia ranging from -0.25 to -9.88 were screened for axial eye growth rate over a period of 6 months using an IOL-Master (Zeiss). Axial growth in right and left eye were averaged. Axial growth rates were compared with the average axial growth rates among age-matched persistent emmetropes.

RESULTS: Axial growth rate ranged from -0.040 to 0.516 mm per 6 months. Average axial growth rate ranged from 0.236 mm per 6 months in 7 year olds to 0.102 mm per 6 months in 13 year olds. Among persistent emmetropes, axial growth rate ranges from 0.085 mm per 6 months in 7 year olds to 0.015 mm per 6 months in 13 year olds (Jones LA et al. 2005, IOVS;46:2317-2327). In myopes aged 7,8,9,10,11,12, and 13 years, the proportion with a normal or sub-normal axial growth rate was 21%, 7%, 25%, 3%, 17%, 17%, and 12%, respectively. The proportion of myopes with a normal or sub-normal axial growth rate in the whole material was 15%.

CONCLUSION: Axial growth rate measured over a 6 months period is proportional with the future axial growth rate. Around 15% of myopic children in the age group 7-13 years have a normal axial growth rate and will therefore probably not benefit from treatment with 7-methylxanthine.
Prevalence of myopia in Australian students of Middle Eastern Backgrounds

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Abstract
Background: The generally low prevalence of myopia among children in the Middle East has been well documented. However, it is not clear whether the prevalence of myopia would be similarly low for this group of children if they were living in a Western country. This study aimed to determine the prevalence of myopia in ethnic Middle Eastern children living in urban Australia.

Methods: A total of 354 schoolchildren (92.2% participation) aged 10 to 15 years (76% boys, 76% girls) attending a private school in Melbourne were assessed for refractive error. The assessment included visual acuity and non-cycloplegic autorefraction using the mean of ten readings taken in rapid succession on a Shin-Nippon open-field NVision-K 5001 autorefractor while viewing a target beyond 6 metres.

Results: All children identified themselves to be of Middle Eastern (91.5%) or Egyptian background and parental. Mean age was 13.7±0.6 years. The prevalence of myopia defined as SER ≥ -0.50D was 14.7%. The prevalence of hyperopia, defined as SER ≤ -7.77D to +5.85D, was 16.4%. Nearly all (99.1%) of children assessed had been subjectively refraction by only 0.18±0.35DS. The spherical component of non-cycloplegic refraction was as influenced by unwanted proximal cues that drive accommodation. It has previously been shown on British adults (83% of 99 subjects aged 18 to 26 years)227 that spherical component of non-cycloplegic refraction measured on a Shin-Nippon autorefractor differed from the subjective refraction by only 0.18±0.35DS.

Background:
The increasing prevalence of childhood myopia in some communities across the world has rekindled the ‘nature-nurture’ debate regarding the development of refractive errors. Investigations into ethnic communities that have migrated to regions with different educational and living conditions may be of significant influence.

Method
Ethics approval was obtained to invite all 384 students in Year 6 and 9 at a private Melbourne school to participate in the study. Visual acuity at 3m and 40cm was taken monocularly and binocularly through habitual correction using a ETDRS LogMAR chart. Objective refraction was undertaken without cycloplegia using an infrared open view Shin-Japan NVision-K 5001 autorefractor whilst the child viewed a distance target in the playground through a window. Ten readings were taken using the continuous mode to ≥120 seconds and the mean spherical equivalent and the mean converted to spherical equivalent refraction (SER). Readings were simultaneously downloaded to a computer running a custom-designed LabView program (National Instruments, Austin, TX).

Results
A total of 354 students (92.9% of those enrolled) with a mean age of 13.17±0.10 years. Mean spherical equivalent refraction (SER) ±0.12D accuracy and a 12mm back vertex distance and readings were taken using the continuous mode to ≥120 seconds and 12mm back vertex distance and the mean converted to spherical equivalent refraction (SER). Readings were simultaneously downloaded to a computer running a custom-designed LabView program (National Instruments, Austin, TX).

Fig. 1. Distribution of right eye spherical equivalent refraction.

Fig. 2. Distribution of left eye spherical equivalent refraction.

Fig. 3. Histogram of mean spherical equivalent refractions (±SE) for male and female students according to age group.

Conclusion
These 2nd and 3rd generation Australian children from Middle Eastern backgrounds and living in Melbourne, Australia, exhibit the same distribution of refractive errors as children predominantly from a Caucasian background who live and school in Sydney1,2,4, notably, the large majority of these ‘late primary to middle school’ children are emmetropic or hyperopic and only 14.7% are myopic.

The low number of myopic children is notable given that this study is the first study to use an open field autorefractor to determine the prevalence of refractive error in Australian children. When the child looks through the Shin-Nippon into the distance rather than into a box held close, the refractive error derived will not be as influenced by unwanted proximal cues that drive accommodation. It has previously been shown on British adults (83% of 99 subjects aged 18 to 26 years) that spherical component of non-cycloplegic refraction measured on a Shin-Nippon autorefractor differed from the subjective refraction by only 0.18±0.35DS.

Low numbers of myopic children are found in the Middle East: studies in Iran cite 4.3% of 12-15 year olds and 7.2% of 5-15 year olds, in Oman studies cite 5.2% of 12 year olds and 8.8% of 16-17 year olds.227 Our finding supports the notion that the environmental influences of the basic Australian lifestyle, with significant outdoor activities and the common educational programs mandated by the education system, may contribute to the development of refractive errors.227 Therefore, further investigation should be undertaken.

Acknowledgements
We wish to acknowledge the role and support from Chris Hall of Optical Manufactures, Amarien, Sydney, in obtaining and setting up the Shin-Nippon Autorefractor.

References
Factors Related to the Myopia Progression in Malay School Children

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INTRODUCTION
Myopia progression is an important public health issue especially in schoolchildren. There are probably many factors related to it and to identify factors to predict who will or will not become myopic has become a great deal of interest1. Reported studies to slow myopia progression have been contradictory2-3,4. Effective myopia treatments might be accomplished if we are able to identify factors related to myopia progression.

OBJECTIVE
This study was conducted to identify the possible factors at baseline related to myopia progression in Malay school children.

METHODS
Subjects
• Malay school children were invited to participate in a cohort study of myopia progression.
• School children age in the study were 7 – 10 years old, with myopia from -0.50 D to -3.75 D and visual acuity with correction better or equal to 6/9.

Measurement
• The subjective refraction – maximum plus with maximum VA.
• Biometry (axial length, anterior chamber depth and crystalline lens thickness).
• Others (keratometry, phoria at near, AC/A ratio, non cycloplegic and cycloplegic auto refraction).
• All measurements were documented every 6 months for 2 years.

Definition
• Only data on right eye were considered for analysis because data from both right and left eyes were the same.
• Annual myopia change (myopia progression) was defined as the change in final refraction relative to baseline divided by 2.
• The school children were classified as
  • non-progressors if the myopic change was less than -0.50 D/year.
  • progressors if the myopic change was more or equal to -0.50 D/year.

Ethics
Approval was obtained from the medical research ethics committee, Faculty of Medicine, UKM and written consent was obtained from parents prior to a child’s participation in the study.

RESULTS
Subjects
Eighty two subjects participated but only 65 qualified to complete the study. There was no significant different of refractive error between participating and non participating subjects.

Table 1. The mean annual change of refractive error and biometry between non-progressors and progressors

<table>
<thead>
<tr>
<th>Parameter at baseline</th>
<th>Non Progressors (n = 37)</th>
<th>Progressors (n = 28)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>refractive error (D/year)</td>
<td>-0.11 ± 0.20</td>
<td>-0.73 ± 0.29</td>
<td></td>
</tr>
<tr>
<td>axial length (mm/year)</td>
<td>0.29 ± 0.12</td>
<td>0.50 ± 0.14</td>
<td></td>
</tr>
<tr>
<td>anterior chamber depth (mm/year)</td>
<td>-0.16 ± 0.26</td>
<td>-0.20 ± 0.12</td>
<td></td>
</tr>
<tr>
<td>crystalline lens thickness (mm/year)</td>
<td>0.13 ± 0.26</td>
<td>0.20 ± 0.31</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION/CONCLUSION
• The anterior chamber depth and crystalline lens thickness at baseline were similar in non progressors and progressors.
• The progressors had significantly higher myopia (-1.89 ± 0.72 D, F = 0.113, df = 63, p = 0.015) and longer axial length (24.13 ± 0.67 mm), F = 1.533, df = 63, p = 0.012) at baseline than non-progressors.
• Myopia progression was faster in Malay school children with higher myopia and longer axial length at baseline.
• Future study – degree of myopia and axial length were among the parameters that should be taken into consideration before myopia treatment.

ACKNOWLEDGEMENT
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REFERENCES
Poster #52

Enhancement of Under Corrected Visual Acuity and Contrast Sensitivity in Myopic Children Using NeuroVision’s Neural Vision Correction (NVC) Technology

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Introduction

NeuroVision™ NVC vision correction technology is a non-invasive, patient-specific treatment based on visual stimulation and facilitation of neural connections responsible for vision. The technology involves the use of an internet-based computer generated visual training exercise regime using sets of patient specific stimuli based on Gabor patches, to sharpen contrast sensitivity and visual acuity.

Children with highly progressive Myopia often use under corrected eyeglasses, due to: improper prescription, intentional under-correction or simply due to the high progression of their Myopia.

We evaluated the efficacy of NVC treatment in the enhancement of under-corrected visual acuity and contrast sensitivity function in Myopic children in Singapore. We also monitored the Myopia progression in these children for a 12 months period after the end of the NVC treatment.

Scientific Background

Cortical neurons in the visual cortex function as highly specialized image analyzers or filters, responding only to specific parameters of a visual image, such as orientation and spatial frequency, and visual processing involves the integrated activity of many neurons, with inter-neural interactions effecting both excitation and inhibition1. Visual contrast activates neurons involved in vision processing, and neural interactions determines sensitivity for visual contrast at each spatial frequency, and the combination of neural activities set Contrast Sensitivity Function (CSF)2. The relationship between neuronal responses and perception are mainly determined by the signal-to-noise ratio (SNR) of neuronal activity, and the brain pools responses across many neurons to average out noisy activity of single cells, thus improving SNR ratio, leading to improved visual performance and acuity.

Studies have shown that the noise of individual neurons can be brought under experimental control by appropriate choice of stimulus conditions, and CSF can be increased dramatically through control of stimulus parameters4-8. This precise control of stimulus conditions leading to increased neuronal efficiency is fundamental in initiating the neural modifications that are the basis for brain plasticity10,11. Brain plasticity (the ability to adapt to changed conditions in acquiring new skills) has been demonstrated in many basic tasks, with evidence pointing to physical modifications in the adult cortex during repetitive performance11,12.

NeuroVision’s technology probes specific neuronal interactions, using a set of patient-specific stimuli that improve neuronal efficiency13,14 and induce improvement of CSF due to a reduction of noise and increase in signal strength. As visual perception quality depends both on the input received through the eye and the processing in the visual cortex, NeuroVision’s technology compensates for blurred (myopic) inputs, coming from the retina, by enhancing neural processing.

Technology Implementation

The building block of these visual stimulations is the Gabor patch (Figure 1), which efficiently activates and matches the shape of receptive field in the Visual Cortex. The fundamental stimulation-control technique is called “Lateral Masking”, where collinearly oriented flanking Gabor patches are displayed in addition to the target Gabor image. The patient is exposed to two short displays in succession, in a random order; the patient identifies which display contains the target Gabor image (Figure 2). A correct detection is provided with an incorrect response. The task is repeated and a staircase is applied until the patient reaches their visual threshold level.

The NeuroVision System

The NeuroVision System is a software-based, interactive system tailored and continuously adaptive to the individual visual abilities. In the first stage, the subject is exposed to a set of visual perception tasks, aimed to analyze and identify each subject’s neural inefficiencies or deficiencies. Based on this analysis, a treatment plan is initialized, and subject specificity is achieved by administering patient-specific stimuli in a controlled environment.

Each session is designed to train, directly and selectively, those functions in the visual cortex, which were diagnosed to be further enhanced. At each session an algorithm analyzes the patient’s responses and accordingly adjusts the level of visual difficulty to the range most effective for further improvement. Between sessions, the progress of the patient is taken into account by the algorithm for the next session generation. Thus, for each subject an individual training schedule is designed based on the initial state of visual performance, severity of dysfunction and progress in course of treatment. The treatment is applied in successive 30-minute sessions, administered 2-3 times a week, a total of approximately 30 sessions. Every 5 sessions, subject’s visual acuity is tested in order to continuously monitor subject’s progress. The average entire treatment duration is around 3 months.

Myopic Children in Singapore

The Singapore Cohort Study of the Risk factors for Myopia (SCORM) found that about 50% of Myopic children (age 7-9) do not wear proper eyeglasses prescriptions. 57% out of these children have a 6/12 or worse VA in both eyes. Out of the 50% Myopic children who do use a proper prescription, 47% have a 6/9 or worse VA in at least one of their eyes.

According to the SCORM study, the Myopia progression in Myopic Children (At least -1.0D in both eyes) 7 to 9 is 0.944D a year. This rapid progression of Myopia means that effectively children in Singapore are most of the time significantly under-corrected even when they are annually prescribed with new corrective eyeglasses.

In this pilot study we evaluated:

1) The efficacy of the NeuroVision NVC technology in enhancing quality of vision ie. under-corrected visual acuity (VA) and contrast sensitivity function (UCS-CSF) in myopic children when they use an under-corrected prescription

2) The progression rate of Myopia in children who use daily a significantly under-corrected prescription (by approximately 1D) after completion of the NeuroVision NVC treatment.

Methods

33 children aged 7 to 9 having a myopic refraction of at least -1.0DS in both eyes (mean cycloctic SE of -2.88D, range -1.0D to -6.00D) completed NVC treatment over a period of 3-4 months. During the course of treatment, subjects were prescribed with eyeglasses that are 0.5D under their full manifest refraction.

Investigations included: manifest and cycloptic refraction, axial length measurements and under-Corrected (1.0DS) VA and CSF.

Investigation were done pre- and post- NeuroVision treatment and every 3 months for the period of 12 months following the end of treatment.

After the end of the NVC treatment, children were prescribed with the highest possible under-correction that allows them a 6/12 binocular VA. 27 Children have been followed up for a complete 12 month period while wearing daily the new under-corrected prescription.

Results

Baseline Under-Corrected (1D Sphere) was 0.47 logMAR, improving by 2.2 lines to 0.249 logMAR at the end of the treatment.

-93% of the participants achieved the treatment success criteria (2 lines of improvement in at least one of their eyes).

-Contrast Sensitivity Improved in all spatial frequencies as shown in Figure 3.

At the end of the NVC treatment, children were prescribed with an average under-correction of 1.147D, allowing them an average binocular VA of 0.22 logMAR.

Table 1 details the Myopia progression during 12 months post end of the treatment.

<table>
<thead>
<tr>
<th>Investigation</th>
<th>End of Treatment</th>
<th>12 months Post treatment</th>
<th>Change in this Study</th>
<th>Average change in same age group in SCORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifest Subjective</td>
<td>-3.60D</td>
<td>-3.07D</td>
<td>0.53D</td>
<td>N/A</td>
</tr>
<tr>
<td>Cycloptic Subjective</td>
<td>-3.60D</td>
<td>-3.00D</td>
<td>0.60D</td>
<td>N/A</td>
</tr>
<tr>
<td>Cycloptic Objective</td>
<td>-3.12D</td>
<td>-3.80D</td>
<td>-0.68D</td>
<td>-0.49D</td>
</tr>
<tr>
<td>Axial Length</td>
<td>24.49mm</td>
<td>24.63mm</td>
<td>0.13mm</td>
<td>0.49mm</td>
</tr>
</tbody>
</table>

Conclusions

Results of the NVC treatment suggest that this technology is able to improve under-corrected VA and CSF in myopic children. It appears to allow functional quality of vision even when the children use a significantly under-corrected prescription.

It appears that using NeuroVision treatment followed by prescription of significantly under-corrected eyewear may slow down the progression of Myopia. We are in the planning stage of a large randomized controlled trial involving myopic Singaporean school children to validate these findings.

References