

Neural vision therapy improves vision of children with myopia

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Neural vision therapy, which involves training the brain to process visual data, has improved the vision of school children by more than 70 percent and has reduced the progression rates of their myopia by half, results of a small-sample study by the Singapore Eye Research Institute (SERI) showed recently.

Eighty-one percent of participants in the pilot study improved by at least two lines of acuity as measured by a standard eye test chart, without the aid of drugs or surgery, while 16 percent improved by three or more lines, said Professor Donald Tan, director, SERI, and deputy director, Singapore National Eye Centre.

After a 1-year follow-up, the average vision of trial participants improved to close to the normal 6/6 in unaided visual acuity, in contrast to their average starting vision of below 6/12. This was maintained for at least 2 years, Tan said.

Moreover, myopia progression among participants slowed by almost 50 degrees in contrast to the average progression of

94 degrees per year among primary school children of the same age group based on the Singapore Cohort Study of Risk Factors for Myopia, Tan said.

"We are delighted with the positive results of this first clinical study of a non-invasive program to improve vision in myopic children. The implications of this are vast

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as vision in children can be improved just by using an easy-to-use computerized program,” Tan said.

As part of the clinical trial, 31 students, aged 7-8 years, used Neural Vision Correction™ (NVC) technology from 2006 to 2008. NVC technology is computer software designed to stimulate neurons in the visual cortex. It was developed by the US-based company NeuroVision.

In a related study among 20 Asians with low myopia, Tan and his colleague Dr. Allan Fong, adjunct research fellow, SERI, found NVC treatment to be safe and has improved uncorrected visual acuity (UCVA) and uncorrected contrast sensitivity in adult patients with low myopia. [*J Cataract Refract Surg* 2008 Apr;34(4):570-7]

The participants' UCVA improved by a mean of 2.1 lines on the Early Treatment Diabetic Retinopathy Study log-MAR chart while contrast sensitivity improved by 1.5 to 18 cycles per degree over a range of spatial frequencies on sine-wave contrast sensitivity chart testing. These gains were retained after 12 months, the study showed.

"This [retention of effect] is not that surprising in view of the memory effect of higher cortical learning programs. After all, one never quite forgets how to ride a bicycle," the authors said in the study.

People with myopia perceive high spatial frequency images as low-contrast images, and neural vision technology corrects it by enhancing contrast sensitivity to perceive differences between an object and its

background.

In the study, students sit about five feet from a computer for 30 minutes, three times a week for 10 weeks, and use a mouse to click through a series of exercises designed to train the visual cortex to see better by sharpening visual images and enhancing contrast sensitivity.

NeuroVision's technology works on specific neuronal interactions, using a set of patient-specific stimuli that improve neuronal efficiency and induce improvement of contrast sensitivity function due to a reduction of noise and increase in signal strength, said Nil Ellenbogen, NeuroVision chief operating officer.

Ellenbogen said that the convincing results of the pilot study will pave the way for a large-scale clinical study that may commence as early as this year.

The large-scale trial will replicate the pilot study among a few hundred Singaporean school children with the aim of evaluating the effectiveness of neural vision therapy in the improvement of under-corrected visual acuity and of assessing how it affects the progression of myopia, he added.