

## Myopia Progression in Children is Associated with Regional Changes in Retinal Function: A Multifocal Electroretinogram Study

Wing-Cheung Ho

Laboratory of Experimental Optometry (Neuroscience), School of Optometry, The Hong Kong Polytechnic University

[patrick.ho@polyu.edu.hk](mailto:patrick.ho@polyu.edu.hk)

Chea-Su Kee

Laboratory of Experimental Optometry (Neuroscience), School of Optometry, The Hong Kong Polytechnic University

Henry H. L. Chan

Laboratory of Experimental Optometry (Neuroscience), School of Optometry, The Hong Kong Polytechnic University

**Introduction:** To determine if retinal function is associated with myopia progression in children over a one-year period.

**Methods:** Twenty-two children (mean =  $11 \pm 1$  years) were recruited in this study. Refraction and global flash multifocal electroretinogram measurements were performed at 49% and 96% contrasts at the initial visit and after 1 year. The amplitudes and implicit times of direct (DC) and induced components (IC) of the mfERG responses were pooled into five concentric rings for analysis. Pearson's correlation ( $r$ ) was performed to determine if myopia progression was correlated with the changes in these mfERG's parameters.

**Results:** The mean myopia progression was  $-0.45 \pm 0.34$ D (range = plano~ $-1.38$ ). At 49% contrast, the IC implicit times from rings 2 to 5 ( $r = -0.57 \sim -0.65$ ,  $p < 0.01$ ), and the DC implicit time at ring 3 ( $r = 0.55$ ,  $p < 0.01$ ), were significantly delayed with myopia progression. At 96% contrast, only the IC implicit time within ring 1 was delayed ( $r = -0.60$ ,  $p < 0.01$ ). In contrast, neither DC nor IC amplitudes at both contrasts were affected ( $r = -0.11 \sim 0.28$ , all  $p > 0.05$ ).

**Conclusions:** Myopia progression in children delayed IC implicit time at 49% contrast predominantly at the paracentral retina. These results support our previous findings (Ho et al., 2011) that the effect of myopia development on retinal function is regional dependent.