

Peripheral optical quality and myopia progression in children

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Dear Editor,

We thank Dr David Atchison for his interest and comments on our manuscript.

When we began this project, we hypothesized that the optical blur due to higher order aberration in the peripheral visual field induces myopia progression. However, we had to change our hypothesis. From this prospective observation, we could find only that myopia progression was correlated with peripheral hyperopia. We are in agreement that the preexisting myopia is correlated with peripheral hyperopia. Spherical equivalent (SE) was negatively correlated with peripheral hyperopia as is shown in Table 2, and we think this result is compatible with some papers to which Dr David Atchison referred in his letter. As the correlation between the change in axial length (or SE) and relative peripheral refraction (PRP) in Table 2, there were positive correlations among them, which means the change in SE (or axial length), that is, myopia progression, is correlated with hyperopic RPR. It is true that, as Dr David Atchison mentioned in his letter, axial length (or SE) can be the confounding factor.

However, interestingly, there was no correlation between axial length and myopia progression ($r=-0.033$, $P=0.863$). Furthermore, RRoFL, the relative refractive values of focal lines, became more emmetropic even in the myopia progression group at the last visit, compared with the initial visit.

We have to admit that this was a pilot study using PSF analyzer (Topcon, Japan) to evaluate peripheral optical quality, and that the number of subjects, especially the myopic subjects, was small in this study. Indeed, hyperopic RPR can be just a result of myopia, and is not a cause of myopia progression. We obtained and evaluated 21 PSFs of four angles from 29 children at two time points, which was equal to almost 5,000 PSFs. We are planning to conduct larger and longer observation using this system. Again, we appreciate his interest and comments on our paper.

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