Reply

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We thank Mehdizadeh and Nowroozzadeh for their interest in our article [1] and also appreciate their comments on the possible mechanisms of the transient hyperopia.

First, we agree with their point that it is not clear whether high blood glucose or its intensive reduction is the primary cause of transient hyperopia. Although all our cases had a hyperopic shift after intensive hypoglycemic treatment, the transient hyperopic shift also occurred in patients with newly diagnosed diabetes without treatment [2, 3].

The generally accepted view is that the diabetes-related short-term fluctuations of visual acuity are primarily caused by accumulation of sorbitol and fructose in the lens by the sorbitol pathway with a decreased lens refractive index following water influx [2].

Mehdizadeh and Nowroozzadeh give another explanation suggesting that an alteration in the refractive indices of the aqueous and vitreous humor in the hyperglycemic state will account for the hyperopic shift. We accept this possibility because we did not measure the refractive indices of the aqueous and vitreous humor in our study. However, the nature and origin of the phenomenon are still unclear.

A recent report by Wiemer et al. [4] shows that hyperglycemia generally does not cause changes in the refractive properties of the healthy eye. The retinal thickness, the refractive indices of the cornea, and the aqueous and vitreous humor remain unchanged in healthy subjects who took the oral glucose tolerance test [5]. Only the subject who turned out to have hyperopia had significant changes in the refractive index of the lens and the anterior radius of the lens. Although the case number is small, Wiemer et al. clearly demonstrate that only the factor of hyperglycemia will not change the refractive index of aqueous and vitreous humor in healthy subjects.

In summary, whether the transient hyperopic shift in newly diagnosed diabetes, as pointed out by Mehdizadeh and Nowroozzadeh, is caused by a decrease in lenticular index of refraction, an increase in aqueous and/or vitreous indices, or temporary choroidal thickening is still unclear. We need more evidence to clarify these speculations.

A well-designed, prospective study with sufficient patients may give us the answer.

References

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