Author Response: Challenges to the Common Clinical Paradigm for Diagnosis of Glaucomatous Damage With OCT and Visual Fields

In our Perspective (“Challenges to the Common Clinical Paradigm for Diagnosis of Glaucomatous Damage With OCT and Visual Fields”), we pointed out that early glaucomatous damage typically includes the macular/central ±8°. Thus, to detect and understand glaucomatous damage, clinicians should perform a 10–2, as well as a 24–2, visual field, and an optical coherence tomography (OCT) scan that includes the macula, as well as one that includes the disc. In addition, we argued that structural (OCT) and functional (visual fields) measures typically agree if one compares the abnormal regions seen on deviation/probability plots.

In his letter to the editor, Dennis Mock addresses the latter point and nicely details some of the technical issues to keep in mind when comparing visual field and OCT measures. However, from the perspective of the clinic, a simple topographical comparison, as we have previously described, will suffice. That is, one does not need to do more than make a qualitative comparison, although this comparison can be quantified without taking into consideration the corrections/issues he describes.

Concerning his technical points, we agree in general for the need to be specific about physical units used in structure-function comparison, as well as the assumptions of the underlying model implied. We have the following two general thoughts. First, he assumes that “The light sensitivity is generally accepted to be proportional to the corresponding underlying quantity of retinal ganglion cells (RGC).” In addition to his reference of Malik et al., others, including us, have also argued for a linear relationship between RGC axon loss and visual sensitivity. Thus, there is considerable evidence to support this assumption. However, there is both theoretical and empirical evidence that suggest the relationship may not be nonlinear in the macula. Further, mean deviation values should not be used for quantitative comparisons of function with structure, as it is a geometric average, and violates the linear assumption above. The anti-logs of these values should be averaged, as previously pointed out. For example, see Figure 6 in Hood and Kardon for an illustration of the logic. Finally, Mock correctly raises the issue of how to best normalize baseline conditions. However, this is a complex issue, and the alternatives too complex, to address fully in this format.

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References

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