Author's Response: Ultrawide field angiography in proliferative diabetic retinopathy

Dear Editor,

We thank Panigrahi *et al*.[1] for their interest and comments on our article "Topographic distribution of retinal neovascularization in proliferative diabetic retinopathy using ultra-wide field angiography."[2] We agree with the comment that it was a cross-sectional study. All the patients in this study were recruited on a prospective basis after the ethics approval was obtained, and they underwent customized imaging. Any retrospective data of the patients were not included in the study.

As clearly outlined in our study, the basic objective was to accurately predict the most likely site of retinal neovascularization in proliferative diabetic retinopathy (PDR). If the most probable site/quadrant of neovascularization in eyes with PDR is known, the ophthalmologist can focus on the said quadrant and identify retinal neovascularization during screening. Panigrahi *et al*. correctly mentioned that wide-angle cameras are costly and may not be available at all ophthalmic centers.[1] Their observation that retinal neovascularization can be picked on color photographs and montage photographs also holds true. However, small neovascularization can be easily missed even by the most experienced observers, while creation of montages of the periphery requires skill and patient cooperation. Therefore, our study is useful and would help in the early diagnosis of retinal neovascularization even in the hands of inexperienced observers, especially when the facility of wide field angiography is not available, as the most likely site of neovascularization would be the superotemporal quadrant as shown in our study.

The authors mentioned that in treatment-naïve cases, the treatment is guided by retinal neovascularization and not by capillary nonperfusion (CNP) areas. Panretinal photocoagulation (PRP) may be associated with several complications including constriction of visual fields and difficulty in near vision and dark adaptation. These complications affect the quality of vision and the patient's perceived quality of life scores.[3] Protocol S compared PRP with anti-vascular endothelial growth factor (anti-VEGF) injections (ranibizumab [RBZ]) in patients with PDR and at 2 years found that patients with PRP had significant visual field loss compared to the patients in the RBZ group. However, *post hoc* analysis at 5 years demonstrated the mean visual field loss in the anti-VEGF group was almost half of that in the PRP group.[4] Progression in visual field changes in the RBZ group was attributed to a number of causes including neurodegeneration secondary to progression of diabetic retinopathy (DR). Anti-VEGF therapy affords benefits in terms of relative preservation of visual field, but carries the risk of endophthalmitis and does not treat the underlying cause, that is, CNP areas. Compliant patients with well-defined vision requirements are the best candidates for targeted laser photocoagulation, which helps in maintaining better quality of vision in these patients for longer periods of time. Lastly, the authors are correct in mentioning that areas with CNP may develop retinal neovascularization later. However, clinically, one may not always see a retinal neovascularization in the areas of large CNP as is expected logically. This suggests that there are other factors which influence the formation of retinal neovascularisation. Assessment of these factors requires prospective observational studies in patients who progress from no DR to PDR.

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