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This article has not been presented earlier

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Sir,

**Reply to Dr Kumar *et al***

We thank Dr Kumar and his associates for their interest in our recent study entitled 'Subthreshold diode micropulse panretinal photocoagulation for proliferative diabetic retinopathy' and for the major concerns they have regarding the study.

Low intensity/high density subthreshold diode micropulse panretinal photocoagulation (SDM PRP) is a laser procedure that allows the management of patients with proliferative and preproliferative diabetic retinopathy without harming the retina or visual function. The desired clinical effect is obtained with low intensity laser applications that do not produce a visible intraoperative burn end point or thermal lesions detectable at any time postoperatively either by clinical examination, fundus photography, fluorescein angiography, or time-domain optical coherence tomography (OCT) as reported by Luttrull *et al*[1–3]; or by fundus autofluorescence photography, indocyanine green angiography, or fourier-domain OCT (JKL, unpublished data).[1–3] In the absence of iatrogenic thermal retinal damage, no complications, side effects, or inflammatory reaction of any kind are observed.

Dr Kumar points out that thermal retinal ablation to decrease angiogenic stimuli and improve retinal oxygenation is a widely accepted hypothesis proposed to explain the action of conventional photocoagulation.[4] However, we remember that thermal retinal destruction has never been shown to be therapeutically necessary. Our results, documenting effective treatment in the complete absence of laser-induced retinal damage counter the claim that tissue ablation is necessary for effective treatment.[1–3] Thus, by exclusion, we believe that high density/low intensity SDM for both diabetic macular oedema and proliferative retinopathy operates by the same mechanism, that is, by inducing the exposed and affected, but unharmed, RPE cell to alter its expression of key cytokines in a way which is clinically advantageous.[1,3,5]

We do not use the titration approach enquired by Dr Kumar as reports from studies employing such titration approaches document a high incidence of retinal burns, which may not appear clinically until sometime after treatment.[6–8] Alteration of SDM parameters based on retinal thickness is unnecessary due to the excellent retinal penetration and minimal scatter of the 810 nm wavelength.[9] However, the primary author's 9 years of clinical experience using SDM as the exclusive laser modality for treatment of retinal vascular disease has taught him that certain alterations in treatment parameters based on fundus pigmentation are necessary to minimize the risk of inadvertent burns, as reported by Luttrull *et al*.[1–3] We agree with Dr Kumar that pain thresholds are subjective and widely variable. However, the pain threshold with SDM PRP is much lower than the visible burn threshold, in contradistinction to conventional PRP. Thus, we find that patients' pain sensation can provide helpful feedback in the absence of a visible treatment end point. We believe that the wide therapeutic window of SDM permits us this welcome accommodation to patient comfort.[1,3]

To date, all reports of various approaches to SDM for treatment of retinal vascular disease describe clinical effectiveness comparable to conventional photocoagulation with less retinal injury. We have reported effective SDM without any retinal injury at all. These are substantive reasons to pursue further study. We thank Dr Kumar and his associates for their pertinent questions and the Editor for this opportunity to respond.

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