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Sir,  
**Reply to Shah *et al***

We thank Drs Shah *et al* for their interest in our paper on obstructive sleep apnoea (OSA) and optic neuropathy.<sup>1</sup> Here, we attempt to elaborate on a few points mentioned by their letter to the editor.

In our study, we analysed each eye independently because normal tension glaucoma and various forms of optic neuropathies like nonarteritic ischaemic optic neuropathy, which may be related to OSA, often present unilaterally and asymmetrically, especially in the early stage.<sup>2–4</sup> Anyway, as suggested by Dr Shah *et al*, we re-analysed the data by collapsing the data into individuals and analysed using Wilcoxon's test (a nonparametric test). The differences of visual field indexes between OSA and control arms were still found to be statistically significant ( $P=0.021$  for the difference between mean deviation in the two arms, and  $P=0.001$  for the difference between pattern standard deviation in the two arms, respectively).

Different statistical tools help researchers to analyse data in different aspects and present them at different angles. Shah *et al* suggested that we should present the difference of visual function indices in means with confidence interval (CI). However, in our series, only a small proportion of OSA patients developed optic neuropathies. Comparing their mean may not yield conclusive information. Therefore, as an alternative, we chose to present the visual field index in a graphical method showing the distribution of data, which gave a clear overall picture demonstrating that a small peak of suboptimal visual field indices was found in the OSA group. Concerning the values of CI, we did present the data in the footnotes of all tables and figures.<sup>1</sup>

Finally, we would like to thank Dr Shah *et al* for mentioning the importance of study design methodology and terminology. We share their view that these are important aspects in any research.

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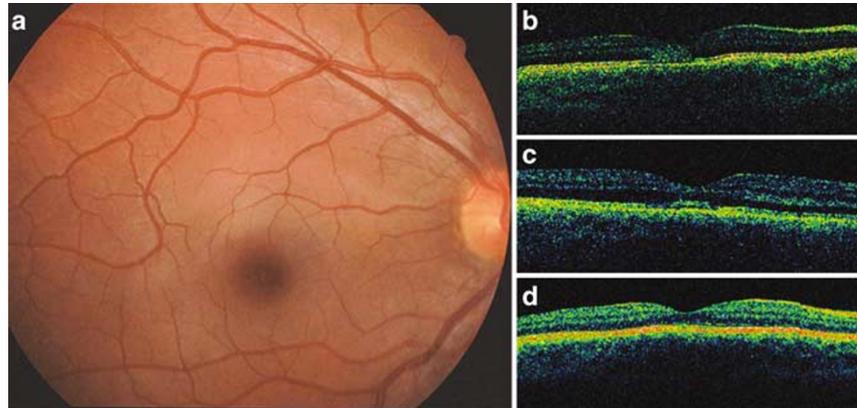
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Sir,  
**Reversible structural disruption of the outer retina  
in acute welding maculopathy**

Exposure to welding arcs might result in maculopathy if appropriate protective eyewear is not used. The damage is thought to stem from photochemical injury to the photoreceptors.<sup>1,2</sup> We report the correlation of clinical and optical coherence tomography (OCT) findings in a case of acute welding maculopathy.

## Case report

A 19-year-old male presented with blurred vision in his right eye after staring at a welder earlier that day. The patient was aphakic in both eyes after lensectomy at the age of 10 years for subluxated microspherophakic lenses. Corrected visual acuity 3 months before presenting to our clinic was 6/7.5 in the right eye. Visual acuity in the left eye was light perception as a result of recurrent rhegmatogenous retinal detachment after trauma and



**Figure 1** (a) Colour fundus photograph of the right eye at presentation showing darkish foveal lesion. (b) OCT findings at presentation, (c) 1 month, and (d) 5 months following exposure to welding arc. Disruption of all foveal layers is seen following exposure (b), with gradual recovery starting at the inner layers (c), following by regaining of the normal OCT appearance of the fovea (d).

development of proliferative vitreoretinopathy. On presentation, best-corrected visual acuity in the right eye was 6/30. Slit-lamp examination of the right eye revealed aphakia and iridectomy. Ophthalmoscopy revealed a dark-red foveal lesion (Figure 1a) in the right eye, whereas fluorescein angiogram appeared normal. OCT (STRATUS OCT™ Model 3000, Carl Zeiss Meditech Technologies) demonstrated disruption of all foveolar layers (Figure 1b). The patient showed gradual improvement in his vision, and 1 month following presentation, an OCT demonstrated normal appearance of the inner foveolar layers while the outer segments still appeared disrupted (Figure 1c). Five months following the injury, visual acuity in the right eye recovered to 6/7.5, and OCT image appeared normal (Figure 1d), but ophthalmoscopy still demonstrated discoloration of the macula.

### Comment

Photochemical retinal damage produced by welding arcs is thought to result from exposure to visible light, which can penetrate the cornea and lens, reaching the retina.<sup>2,3</sup> In aphakia, as in our case, wider spectrum of waves, and in particular damaging short wavelength radiation, may gain access to the retina and exacerbate the damage.

Although OCT findings in acute welding maculopathy have not been reported previously, Bechmann *et al*<sup>4</sup> reported on transient hyper-reflective area involving all foveolar retinal layers in OCT obtained from a patient with early solar retinopathy, a condition in which photochemical injury is also thought to have a role. Thermal damage may also result in a similar hyper-reflective foveal lesion.<sup>5</sup> Recent OCT findings in a report

on chronic welding maculopathy documented permanent disruption of the foveal outer segment.<sup>2</sup> Histopathologic studies of chronic solar maculopathy have demonstrated that most of the disruption occurs mainly in the pigment epithelium and outer segments of the photoreceptors.<sup>6,7</sup> An interesting speculation based on OCT findings in our case and in acute solar maculopathy is that acute photochemical injury may lead to reversible perturbation in photoreceptor outer segment renewal process. More extensive exposure might lead to permanent damage and chronic maculopathy.

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Sir,  
**Sildenafil-associated consecutive nonarteritic anterior  
 ischaemic optic neuropathy, cilioretinal artery  
 occlusion, and central retinal vein occlusion in a  
 haemodialysis patient**

Nonarteritic anterior ischaemic optic neuropathy (NA-AION) is the most severe potential ocular side effect of sildenafil.<sup>1</sup> Pomeranz *et al*<sup>2</sup> reported five patients with sildenafil-associated unilateral blurry vision, altitudinal visual field defects, and optic disc oedema. Only one previous case of bilateral NA-AION after sildenafil is documented.<sup>3</sup> To our knowledge, this is the first report of sildenafil-related NA-AION and cilioretinal artery and central retinal vein occlusions.

#### Case report

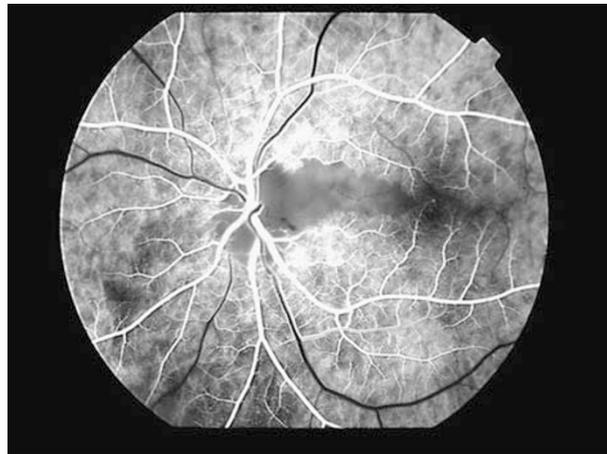
A 36-year-old man treated with haemodialysis for chronic renal failure was admitted with blurred vision in his left eye. He had taken sildenafil 100 mg (Viagra, Pfizer Pharmaceuticals, New York, NY, USA) for the first time the night before.

His blood pressure on admission was 100/60 mmHg. Ophthalmologic examination revealed a visual acuity of 20/20 in the right eye and 16/20 in the left eye, in which an afferent pupillary defect was identified. Ishihara testing showed severely decreased colour sense in the left eye. Fundoscopy revealed hyperemia and oedema in the inferior portion of the left optic disc (Figure 1) and a crowded right optic disc. Left-sided NA-AION was diagnosed.

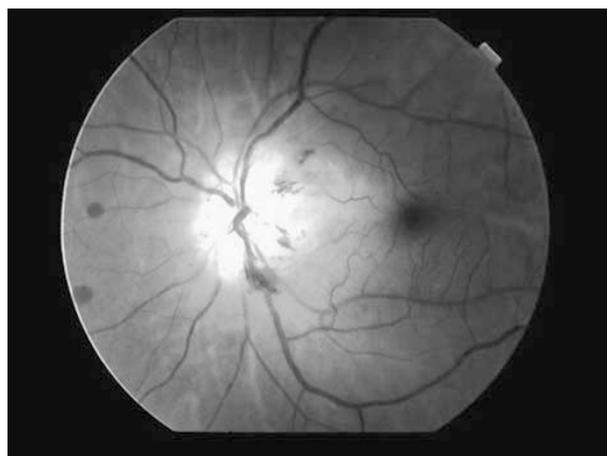
The next day, the vision of left eye deteriorated to only the perception of light, and whitening of the retinal regions beyond the supply of the cilioretinal artery was noted. Fluorescein angiographic examination indicated occlusion of the cilioretinal artery (Figure 2). Ten days



**Figure 1** Fundus photography of the patient's left eye at presentation revealed hyperemia and oedema in the inferior portion of the optic disc but no haemorrhage.



**Figure 2** The day after presentation, fundus fluorescein angiography of the left eye showed occlusion of the cilioretinal artery.



**Figure 3** Fundus photography at 10 days after presentation showed evidence of nonischaemic central retinal vein occlusion in the left eye.