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Sir,

Quicker painless diabetic laser

Not often does an improvement in delivery of treatment occur because of a misunderstanding in a conversation. Five years ago the authors were at a national meeting and informally discussing pan retinal photocoagulation for proliferative diabetic retinopathy. TR was impressed that WW was able to perform this laser treatment more quickly by shortening the duration of each spot of laser from the conventional 0.1 s to 0.02 s.

TR found that at 0.02 s the automatic repeater on the (Coherent) argon laser was able to produce more than eight burns per second. Naturally the power needed to be raised to compensate for this – rarely more than 500 mW. After these faster sessions of treatment he was delighted to hear his patients ask spontaneously why the treatment was less painful than previous occasions. TR had previously found that the more laser patients had had meant that the treatment sessions became more uncomfortable. Since then TR has not needed any periocular anaesthetic injections for proliferative laser treatment.

Two years later, at another meeting, TR praised WW for his splendid tip of shortening the laser burn to 0.02 s. 'No' said WW, 'I use 0.05 s'. On returning to Glasgow WW tried setting the duration to 0.02 s and was equally pleased with its effectiveness and increased comfort for patients.

Why is treatment less painful at 0.02 s? One can speculate that the zone of heat around the burn does not go as deep and therefore perhaps has less effect on choroidal nerves. Is pan retinal laser at 0.02 s as effective as at 0.1 s? The authors cannot say for sure but it certainly seems to be.

A popular ophthalmic textbook suggests 0.05–0.1 s. A literature search on the duration of laser burns was not fruitful but a reference to a short pulse of 0.02 s causing less pain was found on the internet (www.diabeticretinopathy.org.uk). The authors therefore do not claim anything new but are keen to promote this less painful way of delivering laser treatment. They also ponder on whether the value of coffee breaks at national meetings should not be overlooked when points for continuous professional development are being assigned.

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Sir,

Reply to T Rimmer and W Wyke

We read with interest the correspondence on 'Quicker painless diabetic laser,' whereby a pulse duration of 20 ms with corresponding higher power in argon laser panretinal photocoagulation resulted in less painful treatment sessions.[1] The reduced pain during treatment is thought to be due to lower heat conduction to the choroid and sclera.

Early studies of the effect of pulse duration and laser wavelength showed a narrower safety margin with argon laser between retinal burn and retinal haemorrhage for short pulse durations (<50 ms).[2–5] More recently, a semiautomated argon laser delivery system has been developed and tested on rabbits. Using a pulse durations of 20 ms, the threshold for a visible burn was 110–120 mW while that for retinal haemorrhage was 600 mW; suggesting an adequate safety margin.[6] Also, light retinal burns produced using pulse durations of 10 and 100 ms had similar histological appearances at 1 week.[6] However, whether the histological changes in the long-term are similar for both pulse durations is not known. It is also not known if shorter pulse duration burns have the same therapeutic effect in controlling proliferative diabetic retinopathy as longer pulse durations burns.

Prior to promoting a shorter pulse duration for panretinal photocoagulation on anecdote alone, sufficient evidence should be gathered to show there is a significant reduction in pain during treatment, that treatment is equally effective at controlling proliferative disease and that the shorter pulse duration treatments have an acceptable side effect profile.

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Sir,

Quicker painless diabetic laser

We thank Day and Davies for the information they have provided, which seems to support the effectiveness and safety margin of 20 millisecond (ms) pan-retinal photocoagulation (PRP). We would agree that evidence of the superiority of 20 ms PRP should ideally be gathered before promoting it but, for reasons outlined below, that evidence will be elusive. In these circumstances, we counter that for us to fail to advocate this laser treatment would not be correct either. We address their three questions in turn and attempt to persuade them to try 20 ms PRP next time they have a patient who complains of pain.

Firstly, does 20 ms PRP cause less pain? In an attempt to answer this, one could apply, say, several hundred burns at one location at 100 ms and then a similar number at 20 ms at increased power to produce the same level of blanching. The patient could then be asked if one of the two groups of laser burns was more painful than the other. The difficulty here is that if the clinician was biased, in favour of 20 ms burns for example, he could make the 20 ms burns slightly less intense and therefore produce his desired outcome. A photograph covering the two areas might demonstrate equal intensity of the two groups of burns, although the time between laser and photography would be another variable. This strategy has merits, but photographs trying to demonstrate uniformity of smudgy white spots would not convince all. Perhaps, we will have to wait for unbiased clinicians to look into this for us.

Secondly, is PRP at 20 ms as effective as at 100 ms for controlling proliferative diabetic retinopathy? We can only offer circumstantial evidence. A recent audit compared data of vitreoretinal surgery at Peterborough with that at two neighbouring units. We ask the reader to accept the notions that the number of primary retinal detachment procedures over a given period is proportional to a unit's catchment population, and that inadequate PRP would lead to higher diabetic vitrectomy rates. For the period studied, the ratio of diabetic vitrectomies to primary retinal reattachments was 12/36 (1:3) for Peterborough, where nearly all PRP has been at 20 ms for several years. This ratio was between those for the other two units where PRP is probably 100 ms (32/81 and 8/41 or 1:2.5 and 1:5.1; A