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Sir,

We read with interest the article by Kirkpatrick *et al.*[1] who found that corneal abrasions healed more quickly without the use of an eye pad. In their study, the method used to approximate the area of the abrasion was not stated, nor the error that such an approximation would introduce. It was not clear whether the padded and unpadded groups had equivalent pain scores at presentation. This knowledge would have allowed comparison of the relative pain scores between the two groups on successive days, rather than just the rate of pain diminution.

We conducted a similar contemporaneous study to evaluate the use of padding the eye for the treatment of corneal abrasions. We randomly allocated 40 patients with corneal abrasions into two groups, one treated with, and the other without, firm padding of the eye, in addition to guttae cyclopentolate 1% and oculentum chloramphenicol 1%. A record was kept of the number of paracetamol tablets (500 mg) required. To avoid bias from lateralisation, we used a vertical visual analogue scale for the daily assessment of pain. The location of the corneal abrasion was recorded as either predominantly peripheral or central, and the size of the abrasion was assessed by recording the major and minor axes of the defect, to the nearest millimetre, using the gated beam of a slit lamp biomicroscope.

In our study, the two groups were comparable in the age and sex distribution ($p>0.3$ respectively); in the location of the corneal abrasion ($p = 0.63$); in the pain score at presentation ($p = 0.22$); and in the dimensions of the abrasion at presentation ($p>0.4$). There was no significant difference, as determined by measurement of maximum or minimum length, between our groups at presentation ($p = 0.58$ and $p = 0.43$ respectively), or on days 1 or 2 ($p>0.4$) (Table I), by which stage nearly all of the abrasions had healed. Also, there was no significant difference in the pain score between the groups on days 1 ($p = 0.44$) or 2 ($p = 0.89$). There was a significant decrease in the pain score for both groups on days 1 ($p = 0.0009$ and $p = 0.0002$) and 2 ($p = 0.0009$ and $p = 0.0038$), similar to the finding of Kirkpatrick *et al.* The number of patients taking paracetamol and the number of paracetamol taken were similar in both groups ($p>0.2$ and $p>0.8$ respectively [Mann–Whitney U-tests]). Overall there was a significant correlation between the pain score and the number of paracetamol tablets taken for both groups on days 0, 1 and 2 ($0.17<r^2<0.85$; $0.0001<p<0.05$); and on day 1 between the size of the major and minor diameters of the abrasion and the pain score (unpadded: $r^2 = 0.18$, $p = 0.03$ and $r^2 = 0.18$, $p = 0.02$; padded: $r^2 = 0.7$, $p = 0.001$ and $r^2 = 0.5$, $p = 0.04$ [Pearson's correlation]).

The results of our study show that padding of the eye, in addition to the use of a topical antimicrobial and cycloplegic agent, do not affect patient comfort, nor re-epithelialisation. As opposed to Kirkpatrick *et al.*, we did not find that padding the eye decreased healing, rather that it had no effect on healing. Pain, as represented by the number of analgesic tablets taken and visual analogue score, is not influenced by padding of the eye. We agree, therefore, that the use of a topical antimicrobial and cycloplegic agent appears to be adequate for the treatment of simple corneal abrasions. Although there is no indication for padding the eye for the treatment of simple corneal abrasions, conversely, there is no contraindication to its use unless an infection is suspected.[2] It is important to be aware that in both our study and that of Kirkpatrick *et al.* there were only 20 unpaired control cases. If one extrapolates from both studies that approximately 75% (30/40 our study) of abrasions treated with a pad heal by day 2, then to show a 90% healing rate, a power calculation predicts that a sample size of at least 140 controls would be required (ARCUS statistical software, I. Buchan, Liverpool).

Table I. Comparison of padded and unpadded eyes

	No pad			Padded		
	Day 0	Day 1	Day 2	Day 0	Day 1	Day 2
Minor axis (mm)	1.5 (1.73)	0.75 (0.64)	0 (0.12)	1.6 (2.11)	0.5 (0.87)	0 (0.39)
Major axis (mm)	2.25 (2.51)	1.0 (1.12)	0 (0.23)	2.5 (3.06)	1.0 (1.65)	0 (0.56)
Pain: visual analogue (cm)	5.15 (5.15)	1.4 (2.29)	0.1 (0.64)	7.5 (6.35)	2.5 (3.17)	0.2 (0.74)
Analgesia (no. of tablets)	0 (0.53)	0 (1.10)	0 (0.35)	0 (1.67)	0 (2.33)	0 (1.89)

Values are the median (mean).
Major and minor axes were measured in millimetres at the slit lamp biomicroscope. Pain was assessed on a 10 cm vertical visual analogue scale. Analgesia was recorded as the number of paracetamol tablets ingested.

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Sir,

I read with interest the article by Williams *et al.*[1] regarding the outpatient management of small traumatic hyphaema.

I would especially applaud these authors' specific qualification of the necessity for 'compliance' for patients to be treated without hospitalisation. The mean age of their patients was 28.7 years and the youngest was 10 years of age. I believe that children certainly should be considered for hospitalisation, regularly, because of the strong possibility of their non-compliance, the risk of re-injury by a sibling, and/or the inability of the parents to enforce or comply with the treatment regimen. The physician remains responsible for the final outcome even if the patient is non-compliant.

Of special interest was the authors' justification of their choice of outpatient treatment on the basis of cost. They did not use a control group. They do not mention surgery being required in rebleeds or whether anyone lost vision. They imply, therefore, that they were fortunate in apparently having no serious complications in their series. (Several previously reported series do, however, in contrast, show a low correlation between the size of the hyphaema, complications, and final outcome.)

In another series previously reported[2] I worked through the economics, in the United States, and on the basis of our costs strongly recommended that hospitalisation, at least for children, in combination with systemic antifibrinolytic agents or steroids be routinely used, as the computed cost benefits alone far outweighed the costs and risks of hospitalisation and treatment.[3]

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Sir,

We thank Dr Romano for his interest in our recent paper.[1]

Our aim was prospectively to follow the clinical course of carefully selected patients with small traumatic hyphaemas who recuperated at home. We compared the incidence of rebleeding in this group with published figures for hospitalised patients. We were not conducting a cost-effectivity study on the management of small traumatic hyphaemas, nor a trial comparing one treatment with another. Such studies would be designed differently and because of the relative scarcity of the condition would have to be multi-centre.[1] Cost-effectivity analyses such as that in Dr Romano's[2] paper require specific study design and data collection, and therefore would be inappropriate for our data.

Steroids and/or antifibrinolytics have not been employed in the routine management of patients with small traumatic hyphaemas presenting to this unit and so were not included in our protocol. The variables we studied were the complication and attendance rates in patients allowed home rather than admitted for bedrest, other aspects of their treatment being comparable to our normal practice.

Dr Romano suggests that the potential costs of surgery for patients sustaining vision-threatening complications should have been included when considering the management costs of patients with small hyphaemas. We are not aware of any studies which have shown that ambulant outpatients with small hyphaemas have a significantly greater risk of complications than hospitalised bed-bound patients. The potential surgical costs would not therefore be expected to be greater in an ambulant outpatient group than in bed-rested inpatients and were not discussed. The figures we quoted were to illustrate the respective costs of an inpatient stay and a visit to casualty and were not presented as being the final calculated costs of managing our patients.

We agree with Dr Romano's concerns about compliance. As we stated in our paper: 'increased patient convenience and cost saving must be balanced against the high non-attendance rate amongst patients.'

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