term use by the Home Secretary on 21 August 1996, is unlikely to present a major problem to ophthalmologists; it would be interesting to hear of other units' experience of this agent.

Martin Leyland, FRCOpth

Western Eye Hospital
Marylebone Road
London NW1 5YE
UK

References

1. Yih JP. CS gas injury to the eye. BMJ 1995;311:276.
2. Gray PJ, Murray V. Treating CS gas injuries to the eye: exposure at close range is particularly dangerous [letter]. BMJ 1995;311:871.

Sir,

We would like to comment on the study by Bell, Butt and Gardner on 'Warming lignocaine reduces the pain of injection during local anaesthetic eyelid surgery' (Eye 1996;10:558–60). Usually the most uncomfortable part of eyelid surgery for the patient is the administration of the local anaesthetic, and anything that can be done to reduce this discomfort is worth considering. We have found that by diluting the standard 2% lignocaine with an equal volume of water for injection before infiltrating produces much less discomfort for all our patients compared with using undiluted 2% lignocaine. The reduced discomfort causes less eyelid squeezing whilst infiltrating, making it easier to achieve a decent block – the effects of which last long enough for routine lid surgery such as chalazion incision and entropion and ectropion surgery to be adequately completed. Whilst Bell *et al.* describe prewarmed lignocaine to be less painful than cold lignocaine we feel that diluting the 2% lignocaine reduces the discomfort just as effectively and is possibly less time-consuming to do.

Niral Karia
Khuram T. Rahman

Prince Charles Eye Unit
King Edward VII Hospital
Windsor SL4 3DP
UK

Correspondence to:
Niral Karia
Department of Ophthalmology
St George's Hospital
Blackshaw Road
London SW17 0QT
UK

Sir,

The comments by Karia and Rahman are welcomed. The technique of diluting local anaesthetic prior to injection is well recognised and is also used in our department. Whilst using diluted lignocaine would be acceptable for relatively minor procedures such as chalazion incision and entropion and ectropion repair, there would be concern about the adequacy of the block for longer oculoplastic operations such as ptosis correction and more complicated tumour excisions requiring grafts. If further injections were to be needed then the whole purpose of the technique would be defeated.

The act of using warmed lignocaine need not add extra time to a theatre list, but it does require organisation. Thermostatically controlled water baths, dry incubators, baby bottle warmers and yoghurt makers are all commercially available and can be conveniently set up in the anaesthetic room by the nursing staff, half an hour prior to the start of a list, so that the vials of anaesthetic have come up to temperature by the time the first patient has arrived.

We have also been able to show that the use of warmed anaesthetic reduced the pain of injection associated with peribulbar block prior to cataract surgery.[1] An alternative technique which provides an excellent painless block is to use a pre-injection of 1–2 ml of 2% lignocaine diluted to 10% of its strength with balanced salt solution. This is then followed by the main injection of normal strength (2%) lignocaine, by keeping the needle *in situ* and exchanging the syringes. This method could also be applied to lid surgery, however avoiding the potential drawback of a shorter duration of action associated with the use of diluted anaesthetic on its own.

R. W. D. Bell
Z. A. Butt
R. F. M. Gardner

Princess Alexandra Eye Pavilion
Royal Infirmary
Edinburgh EH3 9YW
UK

St John's Hospital
Livingston
West Lothian
UK

Reference

1. Bell RWD, Butt ZA. Warming lignocaine reduces the pain of injection during peribulbar local anaesthesia for cataract surgery. Br J Ophthalmol 1995;79:1015–7.

Sir,

I read with interest N. P. O'Donnell and W. Gillibrand's Letter to the Journal 'A comparison of the efficacy of tropicamide applied topically using a novel ophthalmic delivery system versus a phenyl-

ephrine–tropicamide drop preparation in insulin-independent diabetics.[1]

The novel ophthalmic delivery system (NODS) is of interest in that it offers a different method of delivering drugs to the ocular environment that has a number of advantages. The drug does not need to be dissolved in a carrier; this enables otherwise insoluble compounds or combinations of compounds to be delivered. Drugs can be in optimal pH for corneal penetration rather than the pH of the carrier state. The polyvinyl alcohol NODS have an ocular contact time of at least twice that of a drop, enhancing drug delivery. NODS have an extended shelf life compared with drops and do not require refrigeration, which is of benefit in the developing world.[2,3]

I wish to add my experience with NODS in comparison with drops. I recruited 30 patients from routine out-patient clinics. Patients were excluded if they were on either pilocarpine or propine drops, had had a surgical procedure to the iris or had had uveitis. After informed consent their vertical pupil diameters were measured under standard lighting conditions using the slit beam scale of a slit lamp. Each patient received, randomly, NODS to one eye and drops to the other. The drops were administered sequentially, phenylephrine first. The patients were not given any instructions to prolong contact time – for example by punctal occlusion. The NODS were administered immediately after the drops. After 15–20 minutes the pupil diameters were recorded under the same light conditions. This time was taken in keeping with usual departmental practice and the pragmatic nature of the study.

Of the 30 patients who were recruited, 17 were women and 13 men. Their ages ranged from 31–94 years; mean age for women was 62.8 years, for men 70.1 years. Seventeen patients were diabetic. Thirteen had blue eyes, 8 had hazel eyes and 9 had brown eyes.

The average pre-dilation pupil diameter was not significantly different between the NODS-dilated eyes and those dilated with drops (3.4 mm each). Neither was there a difference between diabetics and non-diabetics (3.5 and 3.2 mm respectively); or a difference between eye colour (3.6 mm for blue, 3.4 mm for hazel, and 3.1 mm for brown).

Four patients had one pupil dilate to greater than 8 mm. Of these, 2 had blue eyes, one of whom was diabetic; one was a brown-eyed diabetic and one was a non-diabetic with hazel eyes. In all these patients the better-dilated eye was treated with drops.

In comparing the dilating effect of drops and NODS, 23 patients had greater dilation in the eye with drops, 5 had greater dilation with NODS and in 2 there was no difference. Drops produced the greater absolute dilating effect (chi-squared = 10.8, $p<0.001$). Taking 6 mm or greater as a clinically useful dilated pupil and using data from all eyes (rather than patients), one can assess the clinical utility between NODS and drops. Nineteen eyes with NODS and 22 of the eyes with drops achieved dilation greater than or equal to 6 mm. This difference was not statistically significant. Overall, 68% of pupils dilated to greater than or equal to 6 mm regardless of the method of dilation.

When the diabetic population was considered, 14 of 17 diabetics had better absolute dilation with drops (chi-squared = 7.11, $0.01>p>0.001$). Clinically useful dilation was the same for NODS and drops, bring 64.7% in either case. Of the non-diabetics, 9 achieved better dilation with drops, 2 with NODS and in 2 patients there was no difference. This breakdown did not reach statistical significance. There was no difference in mydriasis between diabetics and non-diabetics. Blue- and brown-eyed patients obtained a better absolute dilation with drops. Five of the 8 hazel-eyed patients had better dilation with NODS. These five represent all the patients who had better absolute dilation with NODS. This grouping by colour could not be analysed statistically due to the small numbers. I support the conclusions of N. P. O'Donnell and W. Gillibrand that there is no significant difference between the two methods of dilation, and extend them into the general clinic population. If used as unit doses per patient, NODS are 58% the cost of drops.[4]

The authors do not state the numbers of patients with respect to eye colour on which they base their conclusion of the better dilating effect of drops on blue eyes. I could not demonstrate this trend, which has been reported elsewhere,[5–7] and I could not explain the dilation with respect to eye colour that I did observe.

The NODS is a delivery system whose potential has yet to be realised. Its use in the tropicamide form is to be commended not only on grounds of cost and decreased side effects but also to encourage the continuing development of NODS use with other drugs to benefit patient care even further.

Charles J. M. Diaper, FRSC, FRCOphth

Flat 4/2
15 Clarendon Street
St George's Cross
Glasgow G20 7QP
UK

References

1. O'Donnell NP, Gillibrand W. A comparison of the efficacy of tropicamide applied topically using a novel ophthalmic delivery system versus a phenylephrine-tropicamide drop preparation in insulin-independent diabetics. Eye 1995;9:811.
2. Lloyd R. Smith and Nephew Research Ltd. UK patent no. GB 2097 680B.

3. Richardson MC, Bentley PH. Ophthalmic drug delivery systems. In: Mitra AK, editor. Drugs and the pharmaceutical sciences. Basel: Dekker, 1993;58:355–67.
4. Monthly Index of Medical Specialties. 1994;(October):233.
5. Gambill HD, Ogle KN, Kearns TP. Mydriatic effect of four drugs determined with pupillography. Arch Ophthalmol 1967;77:740–6.
6. Huber MJE, Smith SA, Smith SE. Mydriatic drugs for diabetic patients. Br J Ophthalmol 1985;69:425–7.
7. Borthne A, Davanger M. Mydriatics and age. Acta Ophthalmol (Copenh) 1971;49:380–7.

Sir,

We thank Mr Diaper for his comments and are pleased to see that his study reached similar conclusions to ours. Alternative methods of drug delivery are without doubt going to be developed in the future and it is important that relevant clinical studies are performed to determine their clinical usefulness and their potential application to any of the groups of patients under our care.

In response to Mr Diaper's specific point, we had 17 blue, 11 brown and 2 green eyes. In the blue eye group the mean increase in pupil size was 4.15 mm for the drops and 3.61 mm for the NODS (p = 0.0063). In the brown eye group the mean increase was 3.75 mm and 3.28 mm respectively (p = 0.235).

N. P. O'Donnell

Department of Ophthalmology
Royal Liverpool University Hospital
Prescot Street
Liverpool L7 8XP
UK

Sir,

I would like to make a few remarks relating to the article by T. Potamitis *et al.* entitled 'Phacoemulsification versus endocapsular cataract extraction in a unique cohort of patients' (Eye 1996;10:551–4).

1. Phacoemulsification is essentially an extracapsular cataract extraction (ECCE) technique. The term phacoemulsification is related to the phacoemulsification of the nucleus, which takes 10–20% of the time of the whole surgery. The operation is basically an ECCE.

2. By ECCE in your article you mean a manual ECCE. Conventional ECCE is an old system for manual ECCE, which needs a limbal incision of 8–10 mm. The modern approach to manual ECCE is characterised by a 5 mm incision sclero-corneal pocket tunnel, no sutures, quick rehabilitation, is safe and induces 0.25 D astigmatism after 3 months on average. It is essential not to consider ECCE as a specific type of cataract surgery. It is a name given to compare the technique with intracapsular cataract extraction and not with phacoemulsification. ECCE was used before phacoemulsification came into being. Phacoemulsification is part of the ECCE surgery, comprising 10–20% of the total surgery time. *Manual* ECCE should be specified too – the modern approach and the old approach.

Michael Blumenthal, MD

Ein Tal Eye Center
17 Brandeis Street
Tel Aviv 62001
Israel

Sir,

We thank Professor Blumenthal for his comments. Our paper, however, was a comparison between two specific types of cataract extraction. It was not intended as an overview of all the types of cataract surgery available.

We do not disagree that phacoemulsification is an extracapsular method of cataract extraction. For this reason we use the term 'conventional extracapsular cataract extraction' and described in detail our two surgical techniques.[1] Whether phacoemulsification 'comprises 10–20% of the total surgery time' depends largely on the hardness of the nucleus. Furthermore, how much time is spent on phacoemulsification is not the issue. Modern technology and foldable lenses allow the removal of a cataract to be performed through an incision far smaller than any manual technique. It does on average take a little longer than 3 minutes to perform but we feel it is an advantageous technique.

Theodoros Potamitis
John Pearce

Birmingham and Midland Eye Centre
City Hospital NHS Trust
Dudley Road
Birmingham B18 7QH
UK

Reference

1. Potamitis, Pereira AM, Pearce JL. Phacoemulsification versus endocapsular cataract extraction in a unique cohort of patients. Eye 1996;10:551.

Sir,

We congratulate Miss Dayan and co-authors of 'Flashes and floaters as predictors of vitreoretinal pathology. Is follow-up necessary for posterior vitreous detachment?' on their audit of patients presenting with flashes and floaters.[1] However, we believe that their conclusion is not supported by their data. Of 169 patients given follow-up examinations,