An evaluation of the administration of sub-Tenon local anaesthesia by a nurse practitioner

H Waterman, S Mayer, M J Lavin, A F Spencer, C Waterman

Aim: To evaluate the administration of sub-Tenon local anaesthesia (LA) by a nurse practitioner.

Methods: 106 consecutive patients listed for cataract surgery were given sub-Tenon's anaesthesia by a nurse practitioner. The surgical procedure was performed within 15 minutes of the administration of the LA. Pain, state and adequacy of anaesthesia, appearance of the eye, and patient anxiety were measured. Patients' experiences of this new nursing role were gained through interview.

Results: At the beginning of surgery, few patients showed eye movement in any of the four quadrants and the surgeons reported that akinesia was inadequate in only seven (7.1%) cases. Three patients (3.3%) gave a pain score of 3 out of 10 or above during surgery whereas the surgeons assessed the pain relief to be inadequate in eight (8.1%) cases. Five (5.3%) patients required a top up of anaesthesia and 51 (39.8%) patients developed conjunctival chemosis in two or more quadrants. Overall, patients' comments indicate that they were pleased with the new service.

Conclusion: The results suggest that nurse practitioner delivered sub-Tenon LA is an effective and safe method of LA administration for cataract surgery.

In a national survey, it was found that 70% of intraocular surgery is performed using local anaesthesia (LA), 24.2% using general anaesthesia (GA), and 5% using LA plus sedation. The same survey reports that a small proportion (6.7%) of LAs were by sub-Tenon injection. Sub-Tenon anaesthesia has been favourably compared to retrobulbar and peribulbar anaesthesia. Recently, there has been increasing interest in sub-Tenon and topical LA techniques at Manchester Royal Eye Hospital. One hundred and six consecutive patients were surveyed between June and August 1999 in order to evaluate the nursing role in the administration of sub-Tenon LA. The objectives of the study were to assess pain, state and adequacy of anaesthesia, appearance of the eye, and patients' experiences.

METHODS

In 1998, a successful application was made to the clinical theatre lists chosen by convenience.
RESULTS

The age range of patients was 32–98 years, mean 74.7 (SD 11.3) years. There were 60 (57.7%) female patients. Patients undergoing phacoemulsification and insertion of intraocular lens formed the largest group (n=99, 94.3%). Two (1.9%) patients underwent phacoemulsification and insertion of intraocular lens plus trabeculectomy, two (1.9%) patients had extracapsular cataract extraction, and two (1.9%) other patients had cyclodiode.

The minimum number of bupivacaine drops given were three in 101 (97.1%) cases and the maximum number were five in one (1%) case. The majority of patients (n=98, 95.1%) received 3 ml of local anaesthetic; however, two (1.9%) and three (2.9%) patients needed 4 and 5 ml respectively. Five (5.3%) patients required a top up of local anaesthetic of which three were topical, one was by injection, and one unknown. The most frequently (n=98, 96.1%) used local anaesthetic was prilocaine 3% plus octapressin 2.2 ml or prilocaine 4%. Lignocaine 2% with Marcain were given in four (3.9%) cases.

The distribution of pain scores at different time points throughout the procedure are shown in Table 1. A small number, seven (7.7%), patients reported pain scores between 4–6 at the time of the sub-Tenon’s injection. A larger proportion of patients stated that they felt a limited degree of pain during surgery (n=20, 22.5%) and during the subconjunctival injection (n=21, 23.1%). The majority of patients, 84 (98.8%), had pain scores between 0–2 immediately after surgery.

Akinesia was assessed in four quadrants at the commencement of surgery (Table 2).

Further calculations revealed that in 35 patients there was no movement of the eye in any direction. Movement of patients’ eyes was also assessed at the end of surgery (Table 2). The numbers of patients, 65, with no movement in any quadrant of the eye appears to have risen slightly over the course of the surgery.

Under a half of patients (n=37, 42.5%) experienced rotation of the superior oblique muscle. Lid movement was observed in 63 (61.2%) and 60 (59.4%) patients at the commencement and end of surgery respectively.

Conjunctival chemosis occurred in two or more quadrants in 41 (39.8%) patients. A majority of patients (n=72, 69.9%) had either no or one quadrant of subconjunctival haemorrhage.

Surgeons were asked their opinion as to whether the anaesthesia was adequate with regard to (a) patients’ pain; (b) akinesia; (c) vitreous bulge; (d) shallow anterior chamber. On eight (8.1%) occasions surgeons thought the patients’ pain relief was inadequate. In seven (7.1%) cases, surgeons stated that akinesia was inadequate. Vitreous bulge was identified in four (4.1%) patients. A shallow anterior chamber was noted by surgeons in nine (9.1%) cases.

Just over a third (n=37, 35.2%) of patients expressed no anxiety. A small proportion of patients (n=9, 8.6%) had moderate or severe anxiety.

No patients had any systemic reaction to the LA. (Interestingly, an audit of a larger consecutive sample of patients (n=2500) that had received sub-Tenon injection by SM, revealed that four (0.17%) patients had an adverse systemic reaction of which three were vasovagal reactions and the other an allergic response; none was considered life threatening.)

Patients appeared to be very satisfied with the local anaesthetic being administered by a nurse, as one patient stated: “The nurse seemed very competent. It couldn’t have been done better by anyone else” (Interview 7). The patients emphasised the nurses’ ability to make patients feel more relaxed: “The nurse has more time to put you at ease than a
DISCUSSION
As discussed, 3 ml of anaesthetic was administered to the majority patients in our study only five needing a top up. Pain scores were at the lower end of the scale in our study; the large majority (96.7%) of patients scoring 2 or lower during and after surgery. Akinesia appears to have been achieved in the majority of cases as per surgeon assessment.

No serious systemic side effects have been reported since SM began her new role; however, she has been trained in advanced life support skills and an anaesthetist is on duty in the operating department should an emergency occur. All patients are preassessed and any coexisting systemic conditions are identified and treated by appropriately trained personnel. SM assesses each patient before administering the LA and will refer patients to medical staff if thought necessary.

In general, the cosmetic effect of subconjunctival haemorrhage is a frequent reason given for not employing this LA technique. Stevens used adrenaline 0.1% immediately before subconjunctival incision to minimise haemorrhage and found that 32% of his sample had a subconjunctival haemorrhage involving one or more quadrant.3 We are investigating the possibility of using cautery to prevent haemorrhage.

Overall, the results suggest that a nurse practitioner can administer uncomplicated sub-Tenon local anaesthesia safely and effectively with similar effect as other health professionals. There was a high degree of patient acceptance for this mode of LA administration.

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Authors’ affiliations
H Waterman, School of Nursing, Midwifery and Health Visiting, University of Manchester
S Mayer, M J Lavin, A F Spencer, Manchester Royal Eye Hospital
C Waterman, Manchester School of Management, UMIST

Correspondence to: Dr Heather Waterman, School of Nursing, Midwifery and Health Visiting, Coupland III, University of Manchester, Oxford Road, Manchester M13 9PL, UK; heather.waterman@man.ac.uk

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