Topical amethocaine in strabismus surgery

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Summary
A randomised study was performed to assess the effect of topical 1% amethocaine hydrochloride on postoperative analgesia requirements after strabismus surgery. Forty children scheduled for elective operation were allocated randomly to receive either topical amethocaine or normal saline. Postoperative analgesia was evaluated with the use of a four-point assessment score and analgesic requirements. The topical amethocaine provided significantly better postoperative analgesia (p < 0.001) as measured by both the assessment score and the postoperative analgesia requirement.

Key words
Anaesthetics, topical; amethocaine.
Surgery; strabismus.

The problems of anesthesia for surgery to correct strabismus in children include bradycardia, nausea and vomiting and postoperative pain relief. A common anesthetic technique combines the use of atropine to obtund the oculocardiac reflex and intramuscular opioids to provide postoperative analgesia.

Diamond described the use of topical anesthesia alone in adult patients undergoing strabismus surgery and suggested that this technique was beneficial since it avoided the potential hazards of general or retrobulbar anesthesia. The major disadvantage was the incidence of postoperative patient discomfort.

Topical amethocaine is used routinely to provide conjunctival anesthesia in casualty and ophthalmology departments to enable full examination of the eye. The aim of this study was to assess the effect of conjunctival anesthesia provided by topical 1% amethocaine hydrochloride on the postoperative analgesia requirements after strabismus surgery in children.

Methods
Following Ethics Committee approval informed consent was obtained from the parents of 40 children aged 1-12 years (mean 4 years) presenting for elective surgery for correction of strabismus. Children weighing less than 10 kg or those presenting for repeat surgery were not studied. All patients were in ASA group I.

The patients were allocated randomly to two groups. Randomisation instructions were placed in sealed envelopes at the beginning of the trial, which were then mixed and numbered and placed in the anaesthetic room of the ophthalmic operating theatre. When the patient arrived in the anaesthetic room the anaesthetist in charge of the case opened the next envelope and followed the randomisation instructions enclosed. Both groups received a standard premedication 90 minutes before operation consisting of trimethoprim 3 mg/kg and EMLA cream to the proposed venepuncture site. Immediately before the induction of anaesthesia each patient received intravenous atropine 0.02 mg/kg. Anaesthesia was induced with thiopentone 4 mg/kg and the trachea was intubated following suxamethonium 1 mg/kg. Anaesthesia was maintained with the patient breathing spontaneously nitrous oxide 66% and halothane 1-3% in oxygen. During the procedure the patients were monitored using ECG, pulse oximetry, noninvasive blood pressure monitoring and a temperature probe. Postoperative analgesia was prescribed on an 'as required basis' and consisted of paracetamol suspension orally (age 1-5 years 120-250 mg; 6-12 years 250-500 mg) or intramuscular pethidine 1 mg/kg.

Following intubation of the trachea and again immediately before extubation, the trial group had two drops of 1% amethocaine hydrochloride put into the eye being corrected. Normal saline was used at the same times in the control group. The times of the second administration and extubation were recorded.

The patients were assessed for pain on arrival in the recovery ward and at 15 and 30 minutes, and at 1, 2, 4, 6 and 8 hours after operation. The assessor (D.W.) was blind...
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Fig. 1. Total postoperative assessment scores: ■, trial group; □, control group.

to the anaesthetic technique used. The children were transferred back to the ward after 30 minutes. Parents were encouraged to be present in the anaesthetic and when their child returned to the ward.

Assessment was made by the author using a four-point scale: 1, sleeping; 2, awake and quiet; 3, agitated; 4, crying. The pulse and respiratory rate were noted and the times of administration of any analgesics recorded.

Statistical analysis was undertaken using the Chi-squared test for analgesic requirements and the Kruskal-Wallis one-way nonparametric test for assessment scores.

Results

The children varied in age from 1–12 years (mean 4 years) and their weight from 11–46 kg (mean 20.6 kg). The length of the procedure varied from 13 to 50 minutes (mean 26 minutes).

Fifteen out of 20 patients (75%) in the trial group required no further analgesia. The remaining five patients (25%) received oral paracetamol suspension, which was given at between 1 and 4 hours after operation. No patients in this group required pethidine. In the control group only three patients (15%) received no further analgesia; six (30%) received paracetamol at between 30 minutes and 2 hours after operation; six (30%) received pethidine at between 30 minutes and 2 hours after operation and five (25%) received both paracetamol and pethidine at between 30 minutes and 2 hours after operation. There was a significant difference between the two groups (p < 0.001).

The total assessment scores varied from 8 to 32. The mean score for the trial group was 11.4 (range 8–19) and for the control group 19.5 (range 8–32) (Fig. 1). There was a significant difference between the two groups (p < 0.001).

Only three (7.5%) of the 40 patients in the trial had any nausea or vomiting. One was in the control group and two were in the trial group.

Discussion

Infiltration of amethocaine into the extra-ocular muscles has no analgesic effect and therefore postoperative pain following strabismus surgery would seem to be conjunctival.

Diamond' describes the use of topical anaesthesia in strabismus surgery to provide analgesia both during and after operation. The findings of this study show that topical 1% amethocaine hydrochloride gives significant postoperative analgesia and results in a significant decrease in the postoperative requirements of both paracetamol and pethidine.

The assessment of postoperative pain in children is more difficult than in adults because of their relative inability to communicate, fear of the hospital surroundings and the difficulty that they may have in differentiating pain from nausea or other subjective sensations. In this trial parents were encouraged to be present in the anaesthetic room and as soon as their child returned to the ward, in an effort to decrease the distress caused by fear of the hospital environment.

Visual analogue toys have been used to assess pain in children and in those aged over 4 years they appear to achieve this. It was not possible to use toys in this study because many of the children were less than 4 years old. The four-point assessment score was used instead and gave a subjective measure of postoperative pain; objective measurement was obtained from the requirement for postoperative analgesics.

Strabismus surgery is associated with incidences of vomiting that range from 50 to 85%. The existence of an oculo-emetic reflex has been suggested. The 7.5% incidence of vomiting in this study supports the suggestion that pre-operative anticholinergics should be used to reduce the morbidity of vomiting after strabismus surgery.

In conclusion, it is suggested that topical 1% amethocaine hydrochloride may be used routinely in anaesthesia for strabismus surgery since it provides significant postoperative analgesia and decreases the requirement for intramuscular opiates in the postoperative period.

Acknowledgments

I thank Dr B.R. Milne, Consultant Anaesthetist, Doncaster Royal Infirmary, for his support and help during this study and Mr L.R. Koll, Consultant Ophthalmic Surgeon, Doncaster Royal Infirmary, for his permission to include his patients in the study.

References


