Peritonsillar infiltration with low-dose tenoxicam after tonsillectomy

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Summary

We have compared the effect of peritonsillar infiltration with tenoxicam 5 mg and placebo on postoperative pain after tonsillectomy. Fifty patients undergoing bilateral elective tonsillectomy under general anaesthesia were allocated randomly to receive peritonsillar infiltration with tenoxicam 5 mg in 8 ml of normal saline (4 ml per tonsil) or normal saline only, before tracheal extubation. Median time to first request for morphine (30 min in each group, \( P = 0.83 \)), cumulative morphine requirements from 0 to 2 h after surgery (two and one doses, \( P = 0.50 \)), and from 2 to 24 h after surgery (one dose in each group, \( P = 0.17 \)) were similar. There were no significant differences between groups in VAS scores at rest or when drinking 100 ml of water at any time. The power of detecting a reduction in VAS scores of 20 mm was 90% at the 5% significance level. (Br. J. Anaesth. 1995; 75: 286–288)

Key words


Non-steroidal anti-inflammatory drugs (NSAID) are effective in the treatment of postoperative pain, but side effects may hinder their use in some patients in the perioperative period [1]. Local application of small doses may lead to effective concentrations in the target organ without systemic effects [2]. The analgesic effect of topical application of NSAID after surgery has been evaluated in a few studies only [3–5].

The aim of this study was to compare the effect of peritonsillar infiltration using low-dose tenoxicam 5 mg with placebo on postoperative pain after tonsillectomy.

Patients and methods

In a double-blind, randomized study, we studied 50 healthy patients undergoing bilateral elective tonsillectomy. Patients with renal disease, active peptic ulceration, a history of drug or alcohol abuse, chronic pain states or daily intake of NSAID or opioids were excluded. Informed consent was obtained from all patients, and the study was approved by the local Ethics Committee and the Danish National Health Board.

Patients received diazepam 5.0–7.5 mg orally 1 h before operation. General anaesthesia was induced with thiopentone 3–5 mg kg\(^{-1}\), glycopyrronium 0.3 mg and fentanyl 0.15 mg; atracurium 0.5 mg kg\(^{-1}\) was used to facilitate orotracheal intubation. General anaesthesia was maintained with 0.5–1.5% enflurane and 66% nitrous oxide in oxygen. All tonsillectomies were performed using the same blunt dissection technique (Boyle–Davies). Before tracheal extubation, the patients were allocated randomly (closed envelope) to receive infiltration with tenoxicam 5 mg in 8 ml of normal saline (4 ml per tonsil) or normal saline only. The tonsillar bed and peritonsillar tissues on both sides were infiltrated using the same technique, with fan-wise injections from the superior and inferior poles of the fossa. The investigator responsible for the infiltration had no contact with the patients in the postoperative period. All patients were transferred to the same recovery ward and observed by recovery ward nursing staff experienced in postoperative pain treatment.

During the first 2 h after operation, patients received morphine 0.1 mg kg\(^{-1}\) i.v. on request. Patients were then transferred to the general ward, and morphine 0.125 mg kg\(^{-1}\) was administered i.m. on request. No other analgesics were administered.

Patients rated spontaneous pain and pain when drinking 100 ml of water on a visual analogue scale (VAS, 0 mm = no pain, 100 mm worst pain imaginable) 2, 4, 6 and 24 h after extubation, except for 2 h after operation when only spontaneous pain was evaluated.

Data are shown as median values, quartiles and ranges, where appropriate. Statistical analyses were performed with the Mann–Whitney rank sum test for unpaired data using Bonferroni’s type I error rate correction for multiple tests of significance, and Fisher’s exact test. \( P < 0.05 \) was considered statistically significant.

Results

Twenty-five patients received peritonsillar infiltration with tenoxicam and 25 patients normal saline. One patient who received saline was withdrawn immediately after surgery, and data from this patient

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were excluded. Three other patients (two saline and one tenoxicam) were withdrawn from the study 6 h after operation because of administration of supplementary analgesics other than those prescribed in the study design. Data from these patients have been included until the time of withdrawal. There were no significant differences in patient characteristics or duration of surgery between groups (table 1).

Time from the end of surgery to the first request for morphine was similar in both groups (table 2, $P = 0.83$). Cumulative morphine requirements from 0 to 2 h or from 2 to 24 h after surgery were also similar for the two groups (table 2, $P = 0.5$ and $P = 0.17$, respectively).

No significant differences between groups were found in VAS scores at rest or when drinking 100 ml of water at any time (fig. 1).

**Discussion**

Prostaglandins contribute to pain and inflammation after tissue injury, and the antinociceptive action of NSAID is attributed usually to peripheral inhibition of prostaglandin synthesis. It has been demonstrated that topical application of NSAID modifies the inflammatory response to ultraviolet irradiation or injection of carrageenan [6, 7], and reduces local oedema and erythema after burn injury in some [8] but not all [9] studies. Injections of acetylsalicylic acid, indomethacin or paracetamol into the inflamed paws of rats have been shown to attenuate nociceptive responses [10], and topical lysine acetylsalicylate may reverse the hypersensitivity of the joint capsule receptors in rats with polyarthritis [11]. Clinical studies have demonstrated that topical NSAID are valuable for short-term treatment of acute musculoskeletal pain and inflammation [2] and locally applied aspirin and paracetamol were effective for controlling pain in the early postoperative period after third molar surgery [3].

In this study we did not observe an analgesic effect of peritonsillar infiltration with tenoxicam. The standard deviation (SD) of VAS scores in this study was 15–25. We consider a reduction in VAS score of 20 mm (1 SD) to be the smallest medically relevant difference. The power of detecting a reduction in VAS scores of 20 mm in this study was 90 % at the 5 % significance level [12]. Our findings are in agreement with results from a previous study, where no significant pain relief was produced by topical benzydamine spray after tonsillectomy [4].

There may be several explanations for the lack of analgesic effects of tenoxicam. The dose may have been too small (recommended systemic dose 20 mg), but larger doses would lead to significant systemic concentrations and, consequently, no advantage of topical administration with respect to systemic side effects. The analgesic effect of topical tenoxicam after tonsillectomy, if any, may be brief because of rapid washout of active drug. Thus there were no significant effects on pain or opioid requirements after preoperative infiltration of the tonsils with bupivacaine [13] or lignocaine [14], despite the well documented analgesic effects of wound infiltration with local anaesthetics in other minor surgical procedures [15]. In our study there was a tendency for patients receiving tenoxicam to require more analgesic. This may suggest that the injections increased inflammation and pain. In previous

| Table 1. Patient characteristics and peroperative data (median (range) or number). No significant differences between groups |
|---|---|---|
| Tenoxicam group | Saline group |
| n | 25 | 24 |
| Age (yr) | 26 (18–43) | 27 (18–41) |
| Sex (M/F) | 11/14 | 11/13 |
| Height (cm) | 172 (156–192) | 172 (157–186) |
| Weight (kg) | 71 (46–99) | 68 (50–88) |
| Duration of surgery (min) | 25 (15–55) | 25 (12–75) |

| Table 2. Time from end of surgery to the first request for morphine, and cumulative morphine requirements from 0 to 2 h and from 2 to 24 h after surgery (median (range)). No significant differences between groups |
|---|---|---|
| Tenoxicam group | Saline group |
| n | 25 | 24 |
| First request for morphine after op. (min) | 30 (10–∞) | 30 (10–∞) |
| No of doses of i.v. morphine 0.1 mg kg$^{-1}$, 0–2 h after op. | 2 (0–4) | 1 (0–3) |
| No. of doses of i.m. morphine 0.125 mg kg$^{-1}$, 2–24 h after op. | 1.5 (0–4) | 1 (0–4) |

**Figure 1** Pain scores at rest (top) and when drinking 100 ml of water (bottom), in patients who received peritonsillar infiltration with tenoxicam 2.5 mg per tonsil (□) or saline (□) after tonsillectomy (median, upper/lower quartile, minimum/maximum). No significant differences between groups.
studies, however, local tolerance of i.m. tenoxicam was high [16, 17] and transient pain at the injection site has been observed in very few patients [16]. Finally, several studies have suggested that NSAID possess a central analgesic effect [18]. If the central analgesic effect of tenoxicam is the more important, then no major clinical effects of topical administration of small doses would be expected.

References
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