Incisional and intraperitoneal local anaesthetics in laparoscopic cholecystectomy and abdominal hysterectomy: a systematic review

prospect

procedure specific postoperative pain management

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Background

- In patients undergoing abdominal procedures, the administration of subcutaneous and intrafascial wound infiltration with local anaesthetic (LA), or the instillation of LA by the intraperitoneal route, has the potential to reduce postoperative pain and lower supplementary analgesia requirements
- However, evidence from clinical studies for the efficacy of LA administered by these routes has been conflicting
- In order to examine this question more closely, a systematic review of the effects of incisional and intraperitoneal LA in two common procedures, laparoscopic cholecystectomy (LC) and abdominal hysterectomy (AH), was conducted
- The aim of this review was to examine the pattern of effect of incisional and intraperitoneal LA on visual analogue scale (VAS) pain scores for the first two postoperative days following these two different surgical procedures, and to review whether the effects of LA differed in these procedures

Methods

- Systematic reviews were conducted using the methods of the Cochrane Collaboration[1]
- MEDLINE and EmBASE were searched from 1966–June 2003 (LC) and 1966–Jan 2004 (AH) using pre-defined search criteria, and reference lists of identified studies were also searched for further references
- Studies eligible for inclusion were randomised trials of intraperitoneal or incisional LA compared with placebo in which all patients, or a definable subgroup, underwent LC or AH
- The use of a visual analogue scale (VAS) or verbal rating scale (VRS) was required for inclusion. VRS scores were converted to VAS scores (0–100 mm scale)
- Qualitative and quantitative (meta-analyses) analyses were conducted
- Meta-analysis was conducted on mean differences in postoperative VAS scores, grouped by time postoperatively. Outcomes were reported as weighted mean differences (WMD) with 95% confidence intervals
- A difference between LA and placebo of 13 points on the VAS scale was reported as being clinically meaningful[2]

Results

Incisional local anaesthetic

- Five studies (8 arms) examined pre-incisional LA in LC[3–7]
  - of these, 5 arms reported a significant benefit of LA over placebo for pain at rest
  - quantitative analysis of these studies demonstrated a reduction in VAS score at rest of 13.9 at 3 h, 11.0 at 12 h, 12.1 at 24 h and 3.5 at 48 h (Figure 1a)

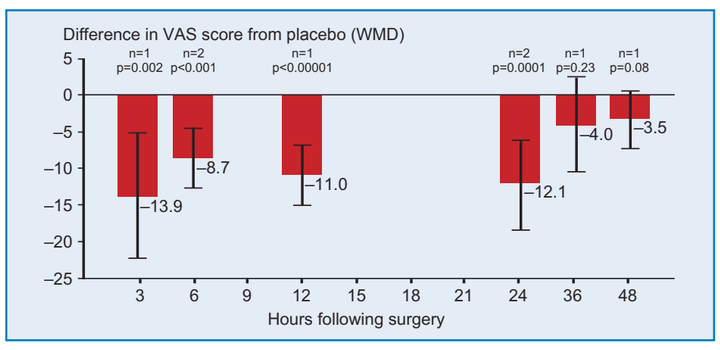

Figure 1a. Effect of pre-incisional LA on VAS scores at rest following laparoscopic cholecystectomy

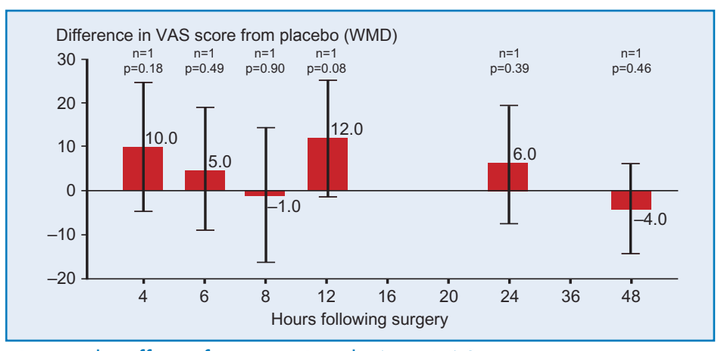

Figure 1b. Effect of pre-incisional LA on VAS scores at rest following abdominal hysterectomy

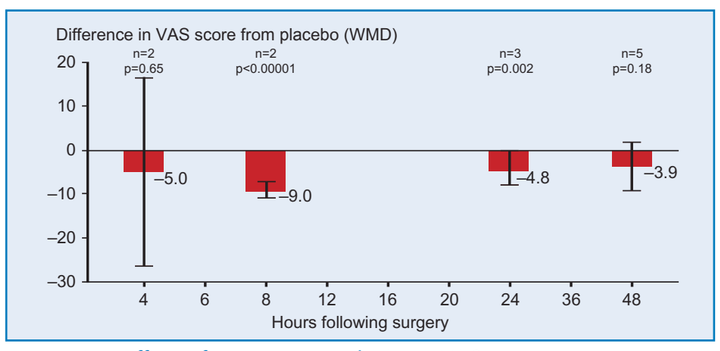

Figure 1c. Effect of post-incisional LA on VAS scores at rest following abdominal hysterectomy

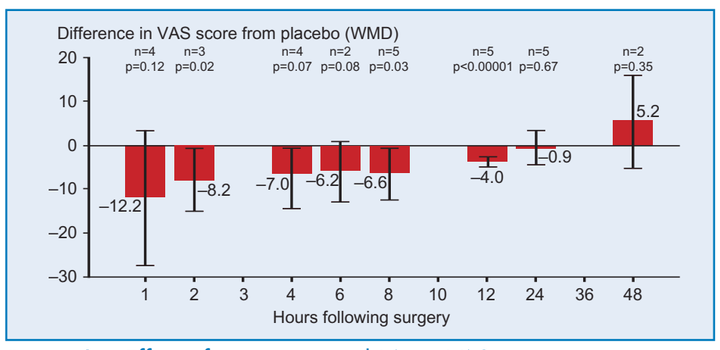

Figure 2a. Effect of intraperitoneal LA on VAS scores at rest following laparoscopic cholecystectomy

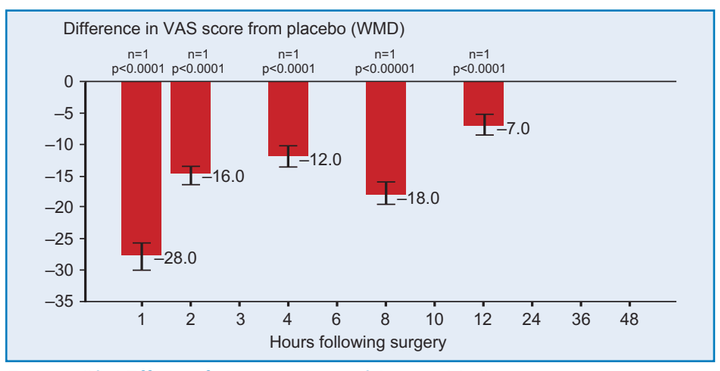

Figure 2b. Effect of intraperitoneal LA on VAS scores on movement following laparoscopic cholecystectomy

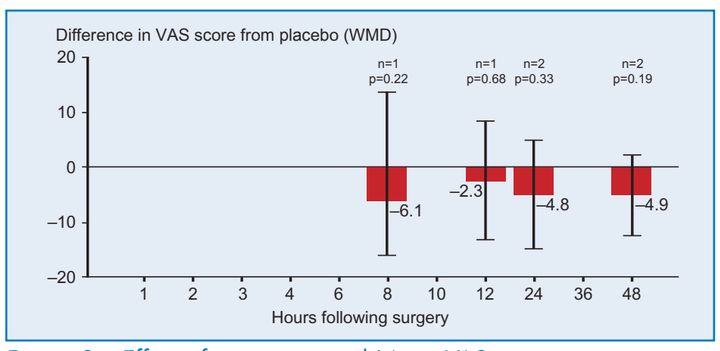

Figure 2c. Effect of intraperitoneal LA on VAS scores at rest following abdominal hysterectomy

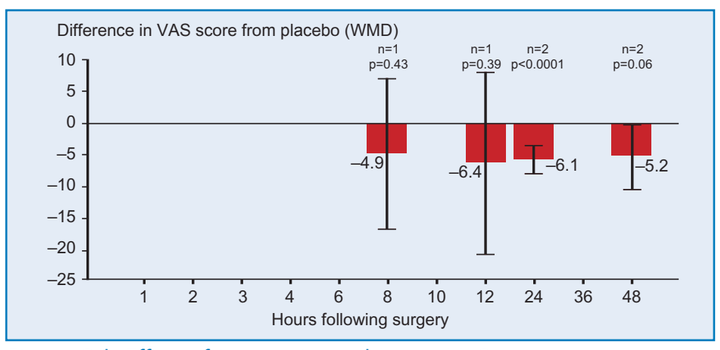

Figure 2d. Effect of intraperitoneal LA on VAS scores on movement following abdominal hysterectomy

Figures are weighted mean differences (WMD) and 95% confidence intervals. N values are the number of studies used in each meta-analysis. Significance values are for the differences between LA and placebo.

- Three studies (3 arms) examined pre-incisional LA in AH[8–10]
  - all three studies reported no significant benefit of LA over placebo for pain at rest
  - quantitative analysis demonstrated no significant or clinically meaningful benefit up to 48 h (Figure 1b)
- Eight studies (9 arms) examined post-incisional LA in AH[11–18]
  - of these, three studies showed a significant benefit of LA over placebo for pain at rest
  - quantitative analysis demonstrated a reduction in VAS for post-incisional LA of 5.0 at 4 h, 9.0 at 8 h, 4.8 at 24 h and 3.9 at 48 h (Figure 1c)

Intraperitoneal local anaesthetic

- Twenty-one studies (29 arms) examined intraperitoneal LA in LC[4,19–37]
  - of these, 17 arms reported a significant benefit of LA over placebo
  - quantitative analysis demonstrated a reduction in pain at rest of 12.2 on the VAS scale at 1 h, 6.2 at 6 h, 4.0 at 12 h and 0.9 at 24 h, with a 5.2 higher score than placebo at 48 h (Figure 2a)
  - benefits on movement-associated pain (1 study) were 28.0 at 1 h, 12.0 at 4 h, 18.0 at 8 h and 7.0 at 12 h (Figure 2b)
- Two studies (2 arms) examined intraperitoneal LA in AH[38,39]
  - of these, one study showed a significant benefit at 24 h and 48 h for VAS pain scores at rest
  - quantitative data were only available from 8 h showing a reduction in score of 6.1 at rest and 4.9 on movement at 8 h, 4.8 and 6.1 at 24 h and 4.9 and 5.2 at 48 h, respectively (Figures 2c and 2d)

Conclusions

- Pre-incisional LA has a statistically significant effect following LC up to 24 h, which is of borderline clinical significance. Data are not available on post-incisional LA in LC
- Although statistically significant benefits were observed at 8 h and 24 h for post-incisional LA in AH, these benefits were not clinically meaningful. Pre-incisional LA has no significant or clinically meaningful benefit in AH
- Intraperitoneal LA has a significant and clinically meaningful effect in reducing pain on movement following LC; this benefit may extend to 12 h
- Data for the benefit of intraperitoneal LA in the early postoperative phase following AH (up to 8 h) are lacking. There is no evidence of a clinically meaningful benefit on pain at rest or on movement from 8–48 h
- These data suggest that incisional and intraperitoneal LA may have a role in the management of postoperative pain in the first 12 hours following LC, but not following AH. These data reinforce the need to examine the benefits of interventions on a procedure-specific basis

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