

Comparative benefits of epidural analgesia following hysterectomy and colonic resection

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Background

- There is increasing evidence that treatment of postoperative pain is most effective when delivered using procedure-specific criteria, taking into account the type of surgical procedure, patient co-morbidities and the risks and benefits of different analgesic regimens^{1,2}
- Hysterectomy and colonic resection are surgical procedures that are associated with different postoperative risks
 - differences in the size and location of the incision give rise to different pain profiles and different lengths of recovery
 - hysterectomy patients may be expected to mobilise relatively early, while for colonic resection mobility typically takes longer
 - paralytic ileus is a greater risk following colonic resection than hysterectomy
- These risks must be taken into consideration in selecting the optimal postoperative pain strategy. This systematic review examines the comparative analgesic and recovery benefits of epidural versus systemic analgesia following hysterectomy and colonic resection

Methods

- A systematic literature review was conducted using the methods of the Cochrane Collaboration³
- MEDLINE and EmBASE were searched from 1966–Jan 2004 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 postoperative epidural versus systemic analgesia, in which all patients, or a definable subgroup, underwent hysterectomy or colonic resection
- Also required for inclusion were postoperative linear pain scale scores, such as visual analogue scale (VAS) scores. All scores were converted to a 0–100 mm scale for analysis
- Qualitative and quantitative (meta-analyses) analyses were conducted
- A difference between epidural and systemic analgesia of 13 mm in VAS score was considered to be clinically meaningful⁴

Results

Five studies examined epidural versus systemic analgesia in hysterectomy

- Qualitatively, these studies showed no significant benefit of epidural analgesia for reducing postoperative pain scores (3/5 studies), the time to first flatus or bowel movement (1/1 study), or the duration of hospital stay (1/1), but there was a higher proportion of studies showing a significant benefit of epidural analgesia for reducing overall opioid use (2/3 studies) (Figure 1)

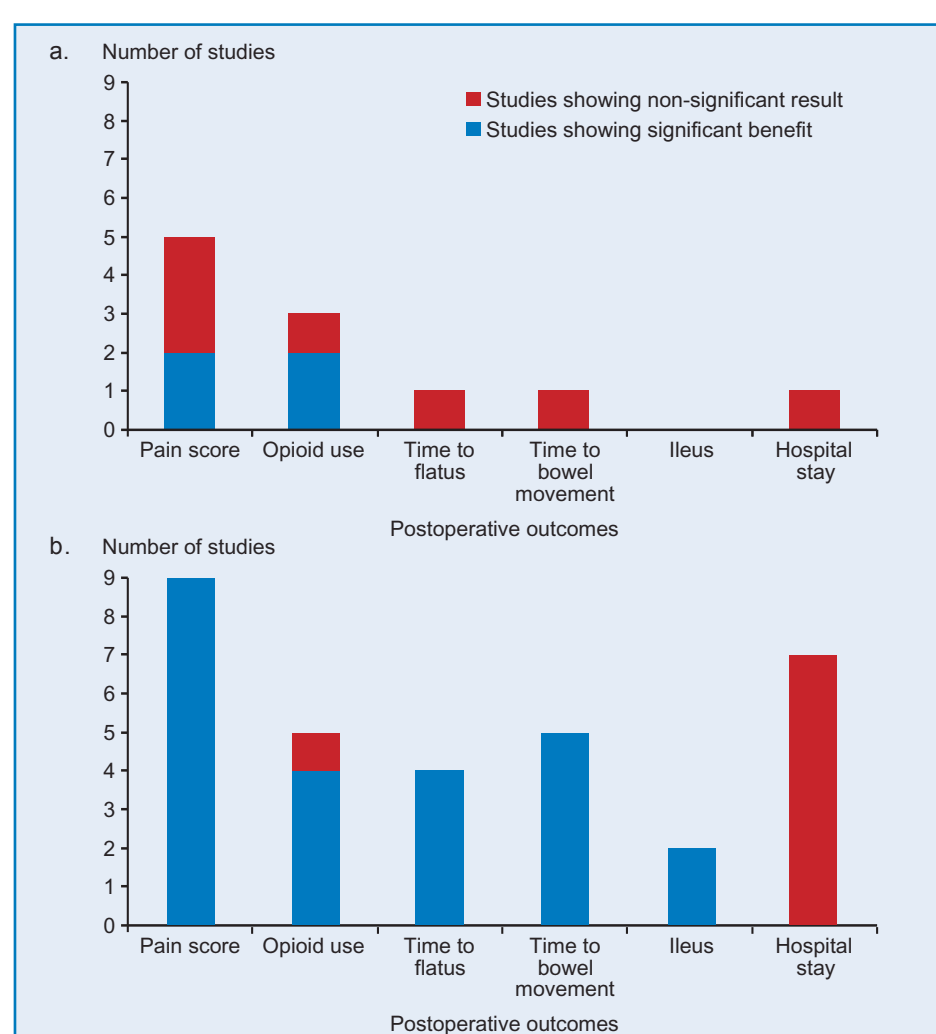


Figure 1. Proportion of studies showing a significant benefit of epidural over systemic analgesia for postoperative outcomes following (a) hysterectomy and (b) colonic resection

- Meta-analyses showed a statistically significant and marginally clinically significant benefit of epidural strong opioid with or without local anaesthetic over systemic strong opioid for reducing VAS pain scores at 4 h, but also showed that this benefit was no longer statistically or clinically significant at 20 h (Figure 2)

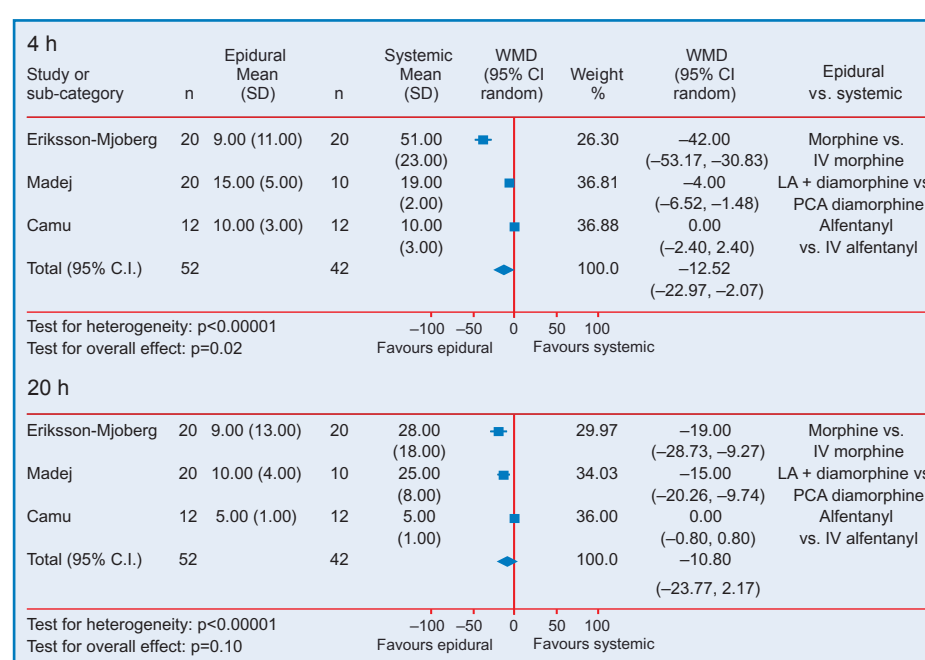


Figure 2. Effect of epidural analgesia on pain following hysterectomy: Meta-analyses at 4 h and 20 h. Data are mean VAS pain scores (1–100 scale) with standard deviations (SD), and weighted mean difference (WMD) for single studies and overall effect; the analyses are stratified by effect size; all regimens were administered postoperatively as infusions or repeat bolus doses; LA = local anaesthetic, PCA = patient controlled analgesia

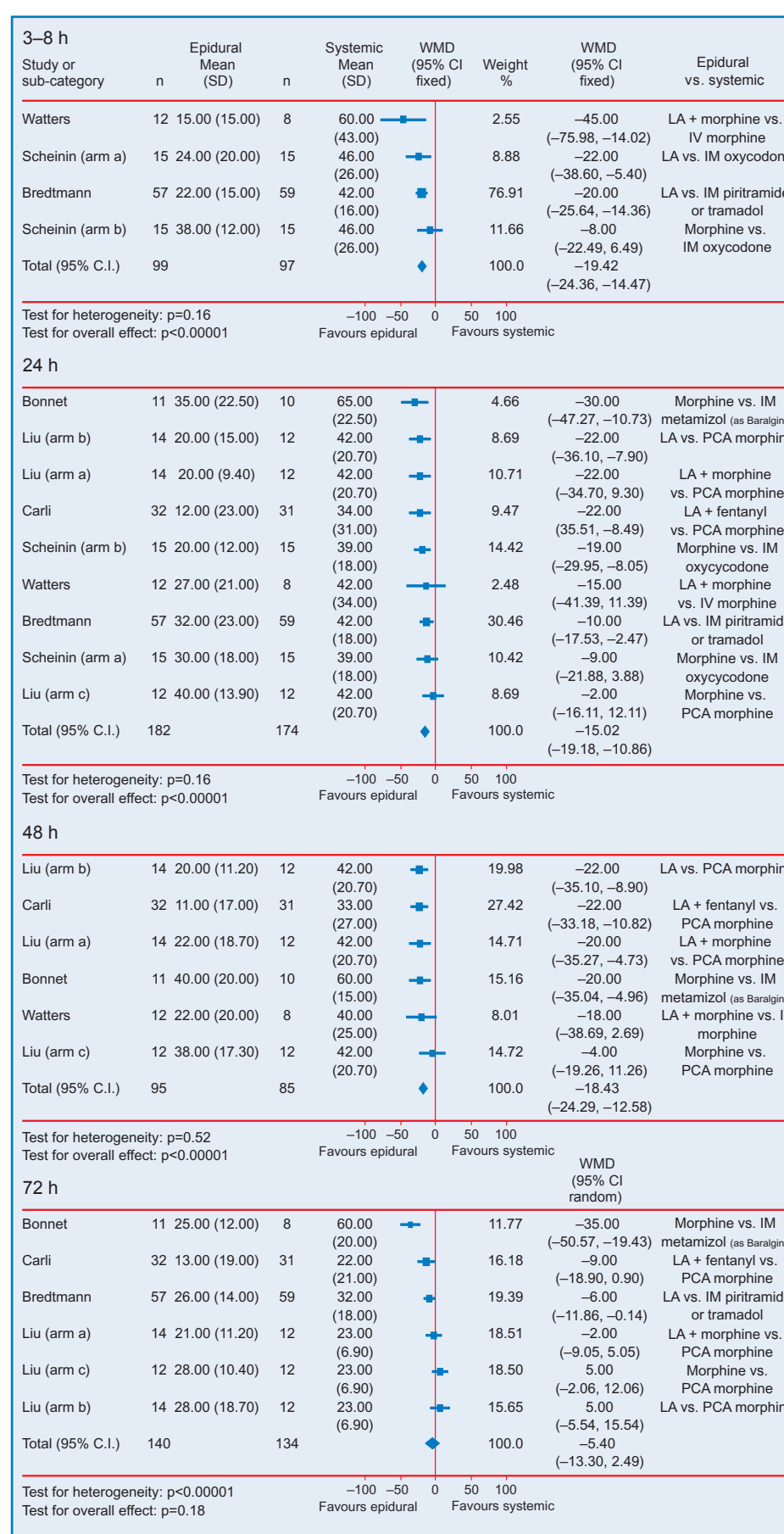


Figure 3. Effect of epidural analgesia on pain following colonic resection: Meta-analyses for 3–72 h. Data are mean VAS pain scores (1–100 scale) with standard deviations (SD), and weighted mean difference (WMD) for single studies and overall effect; the analyses are stratified by effect size; all regimens were administered postoperatively as infusions or repeat bolus doses; LA = local anaesthetic, PCA = patient controlled analgesia

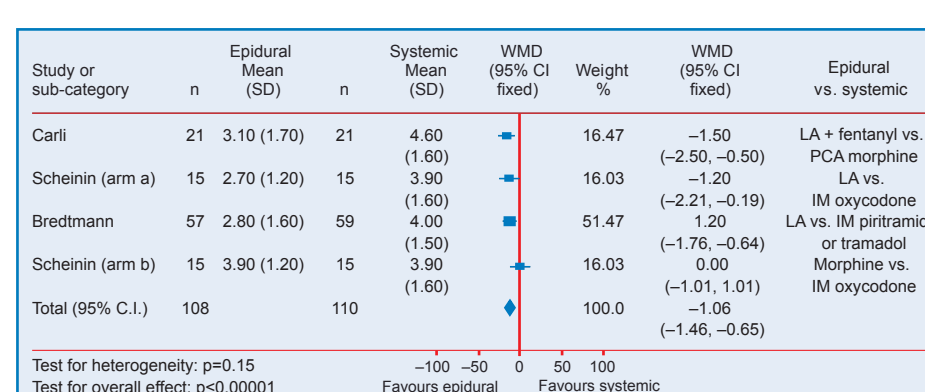


Figure 4. Effect of epidural analgesia on recovery of bowel motility following colonic resection. Data are mean times to first bowel movement (days) with standard deviations (SD), and weighted mean difference (WMD) for single studies and overall effect; the analyses are stratified by effect size; all regimens were administered postoperatively as infusions or repeat bolus doses; LA = local anaesthetic, PCA = patient controlled analgesia

Nine studies examined epidural versus systemic analgesia in colonic resection

- Qualitatively, these studies showed a significant benefit of epidural over systemic analgesia for reducing postoperative pain scores (9/9 studies), overall opioid use (4/5 studies), the time to first flatus (4/4 studies) and first bowel movement (5/5 studies), and the incidence of bowel ileus (2/2 studies). However, there was no significant difference between epidural and systemic analgesia for the duration of hospital stay (7/7 studies) (Figure 1)
- Meta-analyses showed a statistically and clinically significant benefit of epidural over systemic analgesia for reducing VAS pain scores at 3–8, 24 and 48 h, but the difference between the groups was no longer significant at 72 h following colonic resection (Figure 3)
 - the study by Liu *et al.* had three arms and showed that epidural local anaesthetic alone or in combination with morphine was more effective than epidural morphine alone for reducing VAS pain scores at 24 and 48 h (Figure 3)
- Meta-analysis showed a statistically significant reduction of 1.06 days in the time to first bowel movement with epidural analgesia compared with systemic analgesia following colonic resection (Figure 4)

Discussion

- These results suggest that, in both hysterectomy and colonic resection, postoperative epidural analgesia reduces pain more effectively than systemic analgesia, and reduces opioid use. However, differences in postoperative care protocols between groups – which may be dependent on cultural and local practice differences – may also account for these benefits
- This study also demonstrates that epidural analgesic benefits are greater in colonic resection than in hysterectomy. This may be accounted for by the higher pain intensity of colonic resection, and thus greater potential for a significant decrease in pain score
- The results from colonic resection studies demonstrate that epidural local anaesthetic with strong opioid provides more effective analgesia than strong opioid alone, and this is in agreement with previous meta-analyses of studies in laparotomy procedures⁸
- Faster bowel recovery and a reduced incidence of ileus with epidural analgesia were also shown for colonic resection, but not for hysterectomy. These benefits may be fundamental to improving overall outcome following colonic resection, since bowel ileus is a major risk of this procedure and is known to prolong convalescence, which in turn can increase the risk of DVT and other postoperative co-morbidities.^{9,10} The mechanism for improvement in bowel recovery with an epidural local anaesthetic regimen is two-fold: the reduction of systemic opioids, which induce ileus by activating μ -receptors in the gastrointestinal tract, and the addition of epidural local anaesthetics, which reduce ileus via a sympatholytic pathway^{9–11}
 - previous studies have shown that effective analgesia and reduction in systemic opioids provided by epidural analgesia can result in reduced pulmonary and cardiac morbidity,^{5,6} which may be particularly important for high-risk patients undergoing either colonic resection or hysterectomy
- In both colonic resection and hysterectomy, hospital stay is not significantly affected by the benefits of epidural analgesia. This result is in agreement with epidural studies in a variety of surgical procedures.⁶ Length of hospital stay may be dependent on other factors such as local traditions, use of drains and catheters, restrictions and reimbursement policy.⁵ In addition, discrepancies between achieving discharge criteria and actual hospital stay have previously been shown^{12,13}

Conclusions

- The analgesic and safety benefits of epidural analgesia support its routine use in colonic resection, but not in hysterectomy. These findings reinforce the need for procedure-specific recommendations for managing postoperative pain