Comparative benefits of epidural analgesia following hysterectomy and colonic resection

Background
There is increasing evidence that treatment of postoperative pain is most effective when delivered using precise, specific criteria, taking into account the type of surgical procedure, patient comorbidities and the risks and benefits of different analgesic regimens 1-3.

Hydromorphone 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 - hydromorphone 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 Collaboration 4.

MEDLINE and EmbASE were searched from 1966-Jan 2006 using predefined search criteria, and reference lists of identified studies were also searched for further references.

Studies eligible for inclusion were randomised trials of postoperative epidural analgesia, in which all patients, or a definable subgroup, underwent hysterectomy or colonic resection.

Also included were randomised controlled studies with a single postoperative epidural pain scale score, 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 meaningful 5.

Results
Five studies examined epidural versus systemic analgesia in hysterectomy.

Qualitatively, these studies showed a statistically significant benefit of epidural over systemic analgesia for reducing postoperative pain scores (2/3 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). The results from colonic resection studies demonstrate that epidural analgesia was also shown for colonic resection alone, and this is in agreement with previous meta-analyses of studies in laparotomypre6.

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 - which in turn can increase the risk of DVT and other complications, such as cardiac morbidity, 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 earlier studies in a variety of surgical procedures.

Length of hospital stay may be dependent on other factors such as local traditions, use of drains and catheters, restrictions and reimbursement policy. In addition, discrepancies arising from achieving discharge criteria and actual hospital stay have previously been shown.

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.

Nine studies examined epidural versus systemic analgesia in colonic resection.

Quantitatively, these studies showed a significant benefit of epidural over systemic analgesia for reducing postoperative pain scores (9/10 studies), overall opioid use (4/5 studies), the time to first flatus (4/4 studies) and final 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 2).

Meta-analyses showed a statistically and clinically significant benefit of epidural versus systemic analgesia for reducing VAS pain scores at 24 h, and the first bowel movement at 20 h. Data are mean VAS pain scores (0–100 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.

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

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

Figure 2: Effect of epidural analgesia on pain following hysterectomy. Data are mean VAS pain scores (0–100 scale) with standard deviations (SD), and weighted mean difference (WMD) for single studies and overall effect; the analyses are fixed or random, 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. Data are mean VAS pain scores (0–100 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 pain following colonic resection. Data are mean VAS pain scores (0–100 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 5: Effect of epidural analgesia on pain following hysterectomy. Data are mean VAS pain scores (0–100 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 6: Effect of epidural analgesia on pain following colonic resection. Data are mean VAS pain scores (0–100 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.

References
1. Barrie Fischer and Frederick Camu on behalf of the PROSPECT (PROcedure-SPECific postoperative pain management) Working Group

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