Pain Management After Laparoscopic Hysterectomy: Literature Update January 2020

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Hysterectomy is one of the most common major surgical procedures performed in women. The laparoscopic approach is increasingly utilized, as it is associated with reduced postoperative pain and morbidity, as well as earlier recovery and a shorter hospital stay when compared to open hysterectomy.[1-5] However, pain may still be quite severe, particularly in the early postoperative period.[6,7]

The PROSPECT (PROcedure-SPECific postoperative pain managemenT) Working Group is a collaboration of anesthesiologists and surgeons, which formulates evidence-based recommendations for postoperative pain management that are specific for different surgical procedures.[8,9] In addition to procedure-specific evidence, clinical practice information is used to provide overall recommendations considering efficacy and adverse effects of an analgesic technique (www.postoppain.org). The PROSPECT group published recommendations for perioperative pain management for laparoscopic hysterectomy in 2018 (epub) and 2019 (print).[10] This update is meant to inform readers of the relevant articles published since then.

METHODS

A systematic review of randomized controlled trials (RCTs) published between May 2018 and November 2019 assessing analgesic interventions for laparoscopic hysterectomy was performed on December 13, 2019, according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines using EMBASE, PUBMED, and the Cochrane register of controlled trials.[11] The search terms related to pain interventions for laparoscopic hysterectomy surgery without language restriction included "laparoscopic hysterectomy" AND ("postoperative pain" OR "analgesia" OR "visual analog score" OR "local anesthetic" OR "regional anesthesia" OR "regional analgesia" OR "infiltration" OR "TAP block" OR "nonsteroidal antiinflammatory drugs" OR "non opioid analgesic" OR "opioid" OR "dexamethasone" OR "gabapentin" OR "pregabalin" OR "ketamine" OR "paracetamol" OR "acetaminophen" OR "corticosteroids"). We also manually retrieved publications referred in studies identified by our preceding search.

Study inclusion/exclusion criteria

We included RCTs assessing analgesic, anesthetic, or surgical interventions for laparoscopic hysterectomy with pain intensity measured by visual analogue scale (VAS) or numerical rating scale (NRS). Studies that did not measure pain intensity and studies including laparoscopic hysterectomy that reported data pooled with other surgical procedures were excluded. Specifically, the group seeks to determine the relevance of study interventions in current perioperative care practice, and critically evaluate the baseline pain treatment.

In the most recent methodological update, only studies using adequate basic analgesia (paracetamol, nonsteroidal or COX-2-specific drugs) and adequate access to opioid rescue medication will be considered as basis for new recommendations.[12]

RESULTS

We found 37 studies, of which 16 RCT and 3 meta-analyses are reported here. The PRISMA flowchart for the literature search is given in Figure 1. Table 1 summarized the trials and meta-analyses published since the previous guideline was presented**.**

Three studies investigated basic analgesic drugs: Lombardi found no analgesic difference between preoperative oral and intraoperative intravenous paracetamol,[13] whereas Rindos

found no analgesic difference when adding paracetamol to ketorolac.[14] Oh and colleagues found no clinically relevant difference between postoperative patient-controlled analgesia (PCA) using either sufentanil or fentanyl.[15]

Five studies investigated analgesic adjuncts. First, Turkay reported analgesic and opioid-sparing effects of postoperative chewing gum.[16] Two studies found no analgesic efficacy of duloxetine [17] and gabapentin,[18] with both agents not recommended in the most recent PROSPECT recommendations.[10] Kim reported positive effects of trigger point injection or ELMA cream on shoulder tip pain,[19] and Du reported a weak analgesic effect of 0.5 mg/kg dexmedetomidine.[20] There is thus insufficient evidence and no clinical relevance to trigger point injection, and in the light of two negative studies on dexmedetomidine and one marginally positive study (less rescue analgesic doses) in the original recommendation,[10] dexmedetomidine cannot be recommended.

Six studies investigated regional anesthesia techniques. TAP block, not recommended in the recent recommendations, was investigated by Hutchinson, who reported analgesic effect and reduced opioid consumption when Exparel was used,[21] whereas Korkmaz found no analgesic efficacy and only a marginal opioid-sparing effect.[22] Paracervical block had a brief (1 hour postoperatively) effect in one study,[23] and no effect in another study.[24] One study found an analgesic effect when the uterosacral ligament was infiltrated at closure,[25] and one study found analgesic effects when a superior hypogastric block was performed under direct vision during laparoscopy.[26] These studies do not change the previous recommendations.[10]

Sugihara found analgesic efficacy of port site infiltration in the presence of adequate baseline analgesia.[27] In the previous recommendation, Kim [28] had found analgesic efficacy of local anesthetic infiltration when ketorolac was used as baseline analgesia, but only at one timepoint one hour after surgery,[28] and Barron had demonstrated analgesic efficacy of infiltration, but that study did not include adequate basic analgesia.[29] There is thus growing, but still limited, evidence precluding a definitive recommendation of port site infiltration.

Finally, Radosa showed that lower (8 mmHg) infiltration pressures resulted in lower postoperative pain intensity than high (15 mmHg) pressures.[30]

In conclusion, the recent studies do not change the previously published recommendation, even though we note a new high-quality trial with adequate basic analgesia supporting the use of port-site infiltration.[27]

Figure 1: PRISMA Flow chart of literature search

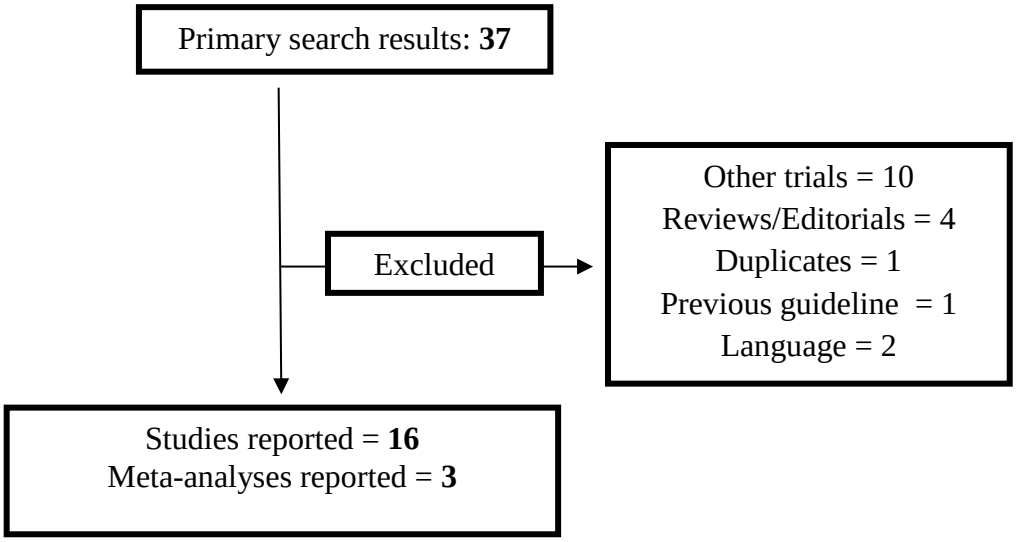

Table 1: Summary of key results from studies evaluating systemic analgesics, analgesics adjuncts, regional anaesthesia, and surgical procedures in patients undergoing laparoscopic hysterectomy.

Study	**Study design / Adequate baseline analgesia**	**Pain Scores**	**Cumulative opioid doses**
Baseline analgesia (systemic nonopioids)			
Lombardi, 2019 [13]	Pre-emptive oral, or intraoperative intravenous paracetamol 1g. *Baseline analgesia:* None other than paracetamol. *Number of patients:* 38 / 37.	NS	NS
Rindos, 2019 [14]	Intravenous paracetamol, or Placebo. *Baseline analgesia:* Ketorolac. *Number of patients:* 89 / 91.	NS	NS
Opioids			
Oh, 2019 [15]	Intraoperative and postoperative (PCA) fentanyl, or sufentanil assumuing 5:1 equipotency. *Baseline analgesia:* None reported. *Number of patients:* 31 / 33.	NS	More rescue boli in fentanyl group.
Analgesic Adjuncts			
Turkay, 2019 [16]	Chewing gum postoperative, or Controls. *Baseline analgesia:* None reported. *Number of patients:* 58 / 51.	Lower in chewing group.	Lower in chewing group.
Takmaz, 2019	Oral duloxetine 60 mg 2 hours	NS	NS

[17]	before and 24 hours after surgery, or Placebo. *Baseline analgesia:* Paracetamol, Metamizol. *Number of patients:* 40 / 37.		
Tulandi, 2019 [18]	Oral gabapentin 600 mg, or Placebo. *Baseline analgesia:* Paracetamol, Naproxen. *Number of patients:* 43 / 45.	NS	NS
Kim, 2019 [19]	Trigger point injection (TPI), EMLA, or Control to control shoulder tip pain after LH. *Baseline analgesia:* Ketorolac or Tramadol as needed. *Number of patients:* 24 / 25 / 25.	Lower in TPI or EMLA group.	NS
Du, 2018 [20]	Dexmedetomidine 0.5 mcg/kg intraoperatively, or Placebo. *Baseline analgesia:* None reported. *Number of patients:* 41 / 40.	Weak effect of Dexmedetomidine.	Reduced PCA demand in Dexmedetomidine group.
Regional anaesthesia			
Hutchins, 2019 [21]	TAP block using Exparel, or port-site infiltration using plain bupivacaine. *Baseline analgesia:* Paracetamol, Ibuprofen. *Number of patients:* 31 / 31.	Maximum pain score during first 24 hours reduced in TAP group.	72-hour opioid consumption reduced in TAP group
Korkmaz, 2019 [22]	Preincisional subcostal TAP block, or Sham block. *Baseline analgesia:* Single	NS	Lower in TAP group by 10-20%.

	administration of dexketoprofen. *Number of patients:* 30 / 30.		
Radtke, 2019 [23]	Preincisional paracervical block, or Sham block. *Baseline analgesia:* None reported. *Number of patients:* 21 / 20.	Lower 30 and 60 minutes postoperatively.	Not reported.
Barr Grzesh, 2018 [24]	Preincisional paracervical block, or Sham block. *Baseline analgesia:* Opiate, acetaminophen, ibuprofen as needed. *Number of patients:* 68 / 64.	NS	NS
Kwack, 2018 [25]	Ropivacaine infiltration of uterosacral ligament at closure, or Sham block. *Baseline analgesia:* Ketorolac. *Number of patients:* 20 / 20.	Lower in ropivacaine group at 2 hours.	Lower in ropivacaine group.
Aytuluk, 2019 [26]	Superior hypogastric block, or No block. *Baseline analgesia:* NSAID at discretion. *Number of patients:* 20 / 20	Lower in block group at 0 - 6 hours.	Lower in block group.
Port site infiltration			
Sugihara, 2018 [27]	Port site infiltration using plain levobupivacaine, or Saline. *Basic analgesia:* Paracetamol, pentazocine or diclofenac as needed. *Number of patients:* 147 / 147.	Lower at selected timepoints in Infiltration group.	Lower in Infiltration group.
Surgical techniques			

Radosa, 2019 [30]	Standard (15 mmHg) or Low (8 mmHg) inflation pressure. *Baseline analgesia:* Metamizole. *Number of patients:* 87 / 91.	Lower in Low pressure group.	Lower in Low pressure group.
Systematic Reviews			
Lee, 2019 [31]	18 trials, Comparing vaginal and laparoscopic hysterectomy, VH has lower 24 hour pain scores.		
Bacal, 2019 [32]	14 trials, TAP block analgesic in both AH and LH, reduction in morphine in AH, but not LH.		
Zhou, 2018 [33]	13 trials, TAP block helpful in AH but not LH		

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