Latest approval: December 21 2017

Title:

Para-cervical block prior to laparoscopic hysterectomy as an adjuvant treatment to reduce postoperative pain.

Project Summary:

Hysterectomy is one of the most common surgical procedures performed in the United States. Adequate analgesia and a faster recovery from surgery have become key factors that have taken the front stage in recent years. Increased use of minimally invasive techniques as well as the implementation of adjuvant treatments such as TAP-block are examples of strategies that have come into play in order to reduce postoperative pain scores and hasten recovery. We propose the use of a paracervical block with bupivacaine performed prior to a hysterectomy as a method to further reduce postoperative pain. This is a prospective, blinded randomized controlled trial in which patients that are scheduled to undergo a laparoscopic hysterectomy would be allocated to one of two groups: Paracervical block with local anesthetic (bupivacaine 0.5%), or placebo. After the patient is placed under anesthesia, 10 mL of 0.5% bupivacaine would be injected into the cervical stroma at 3 and 9 o'clock, which is standard technique for para-cervical block. The remainder of the procedure will then continue in a regular fashion. Alternatively, patients in the control group will be injected with 10 mL of normal saline. The surgeon would be blinded as to patient allocation. At the end of the case, pain will be assessed using a visual analogue scale with a range from 0 to 10 by one of the researches who will also be blinded to the group. This will be done at 30 and 60 minutes after surgical stop time. Additional pain control in the PACU will be standardized to all patients. We will use T-Student tests to assure groups are homogenous to age, BMI, operating time, history of cesarean deliveries, and uterine weight. Chi-square and Ancova analysis will be utilized to determine if there is a significant difference in reported pain scores between groups. We will also stratify subjects based on uterine weight, history of cesarean delivery, additional procedures, etc. and determine if this has an effect on the reported pain scores.

Hypothesis:

Performing a para-cervical block with local anesthetic prior to a laparoscopic hysterectomy significantly reduces pain after the procedure.

Specific aims:

Determine if infiltrating the cervical stroma with local anesthetic prior to performing a hysterectomy will reduce postoperative pain scores, and hence increase patient satisfaction.

Secondary aims:

Determine if there is a difference in baseline pain depending on additional procedures performed, and their response to the paracervical block.

Determine if there is a difference in response to paracervical block based on history of cesarean deliveries or uterine weight.

Background/Significance:

Hysterectomy is one of the most common surgical procedures performed in the United States, with more than 600,000 done annually. Over the last decade, there has been major changes in regards to the surgical approach utilized. With the advent of laparoscopy and robotic surgery, the rate of procedures done vaginally or abdominally has decreased significantly.   One of the major drivers to this change is the demand for a faster recovery and decreased postoperative discomfort. Additionally, several adjuvant methods such as a TAP (transverse abdominal plain) block, ERAS (expedited recovery after surgery) pathway, etc. have been developed in order to minimize pain after surgery and hence increase patient satisfaction. Paracervical block is a particular technique that has been evaluated in multiple studies as a way to reduce pain after vaginal surgery. Studies have been successful in demonstrating an improvement in pain scores after these types of procedures. However, to our knowledge, there has never been follow-up to evaluate this method during the laparoscopic approach, with or without robotic assistance. The rationale of why this technique may be beneficial during a hysterectomy is that after infiltrating the cervical stroma with local anesthetic, it will diffuse towards the pelvic sidewalls via the lymphatic and capillary systems, which would allow for the anesthetic agent to come in direct contact with the nerve plexuses that innervate the pelvic structures. Safety of the technique has been proven over the years, given that it is widely used during office procedures that involve manipulation of the cervix. Although much of the focus regarding reducing postoperative pain has been centered on the abdominal wall and port sites, it is undeniable that a significant portion of pain actually arises from the pelvic surgical site; particularly since laparoscopic trocars have become smaller, resulting in less trauma. Our aim is to determine if infiltrating the cervical stroma with local anesthetic prior to performing a hysterectomy will reduce postoperative pain scores, and hence increase patient satisfaction.

Methods

Study design

This is a prospective randomized controlled trial in which patients that are scheduled to undergo a laparoscopic hysterectomy would be allocated to one of two groups: Paracervical block with local anesthetic (bupivacaine 0.5%), or placebo. This would be achieved using block randomization. The

intervention would be performed after the patient is under general anesthesia, prior to starting the surgery. Patients would be consented in the office or preoperative area (before receiving sedatives). As far as the intervention itself, it would consist of injecting 10 mL of 0.5% bupivacaine into the cervical stroma at 3 and 9 o'clock, which is standard technique for para-cervical block. The remainder of the procedure will then continue in a regular fashion.   Alternatively, patients in the control group will be injected with 10 mL of normal saline. The surgeon would be blinded as to patient allocation. The formulations (saline or bupivacaine) will be previously prepared in a syringe in the operating room by a member of the research time prior to beginning the procedure.   At the end of the case, pain will be assessed using a visual analogue scale with a range from 0 to 10 (Wong-Baker faces – appendix 1) by one of the researches who will also be blinded to the group. This will be done at 30 and 60 minutes after surgical stop time. Additional pain control in the PACU will be standardized to all patients.

Study Subjects

Subjects will be selected based mainly on the fact they are undergoing a hysterectomy.

Inclusion criteria:

- Undergoing laparoscopic hysterectomy with or without salpingoophorectomy for benign indications
- Undergoing laparoscopic hysterectomy with robotic assistance with or without salpingoophorectomy for benign indications
- Between 18 and 60 years of age

Exclusion criteria:

- Intraoperative detection of malignancy
- Undergoing additional procedures at the time of surgery (except prophylactic McCall culdoplasty/uterosacral ligament suspension, excision of endometriosis, appendectomy, cystoscopy)
- Inability to perform paracervical block due to anatomic abnormalities (absent/flush cervix)
- Known allergy/sensitivity to bupivacaine
- Intraoperative bowel injury, bladder injury, ureter injury or major vessel injury that required repair.

Sample Size

Based on previous publications, it was determined that the expected mean pain score on postoperative day 0 after a TLH was 6 on the VAS, with a SD of 2. (10, 11) In order to detect

at least a 40% reduction in postoperative pain between groups, with a significance level of 5% and a power of 80%, a sample of 32 was required.

Data Collection

Data points to be collected are as follows:

- Age
- BMI
- Operating time
- History of cesarean deliveries
- Preoperative indication for surgery (pain, prolapse, tumor, bleeding, etc)
- Procedures performed (if ovaries/tubes were removed, if robotic assistance was used, if any additional procedures that are exceptions from the exclusion criteria were performed).
- Specimen weight
- Uterine pathology
- Pain score at 30 minutes (see appendix 1 for Wong-Baker scale)
- Pain score at 60 minutes
- Number of days in the hospital (zero if discharged on same-day)

Data Handling

A master key will be generated during randomization. It will contain patient initials and medical record number, and an individual code. Only the primary investigator will have access to this master key.

A separate de-identified database using the individual code as index will be used for collection of all data points. The data that can be collected on the day of surgery (baseline characteristics, operating time, pain scores, etc) will be collected that day using a standardized form (appendix 2). This will later be transferred to the de-identified database. Using the master key, we will research pathology reports when available to complete final data points (uterine weight, histology, etc).

The data-collection sheets will be destroyed as soon as they are transferred into the de-identified database.

Data Analysis

We will use T-Student tests to assure groups are homogenous to age, BMI, operating time, history of cesarean deliveries, and uterine weight. ChiSquare and Ancova analysis will be utilized to determine if there is a significant difference in reported pain scores between groups. We will also stratify subjects based on uterine

weight, history of cesarean delivery, additional procedures, etc. and determine if this has an effect on the reported pain scores.

Time Frame

We expect to be able to consent and enroll at least two patients per week (average range of hysterectomy procedures per week from the surgeons that will participate is 5-10). We expect the data collection phase to span over 30 weeks approximately.

Strength/Innovation

Patient satisfaction is a center point in today's healthcare. Faster recovery with less discomfort is not only standard of care, but may also translate into major economic advantages, such as less narcotic use and a decreased rate of postoperative admission. Using this technique as an adjuvant treatment for pain after laparoscopic hysterectomies has never been explored. There is data published for similar procedures, which demonstrates a clear benefit. If this study demonstrates significant improvement in pain scores, it has the potential to change standard of care for pain control during hysterectomy procedures.

Limitations

The main confounding factors are difference in operating style between surgeons and baseline surgical characteristics (large uteri that may require more dissection and tissue manipulation, etc.). To control for this we are only recruiting patients from 3 surgeons who have a similar operating technique. In addition to this, we are documenting operating time and specimen weight, which can be used to compare both groups and assure that they are homogenous to these potential confounders. Further analysis will also be made specifically stratifying the data based on these characteristics.

Risks

The risks of the procedure are minimal. Regarding possible adverse reactions to the local anesthetic, there is no additional risk given that this is already routinely administered during surgery. Patients will be screened to confirm they do not have a history of allergies to the medication. Possible reactions include hypotension, bradycardia, headaches, tremors, etc.

The parcervical block is routinely performed in the office setting before most invasive procedures involving the cervix, and risks are minimal, similar to those involving any subdermal injection. Possible risks include bleeding from injection site.

There is also the potential risk of accidental disclosure of the health information that will be collected.

Benefits

This study may find new methods of improving postoperative analgesia for patients undergoing minimally invasive hysterectomy procedures which may lead to less narcotic use, faster discharge from hospital, and greater satisfaction.

Costs

There is no additional costs. Local anesthetic and saline are products that are routinely used during all laparoscopic hysterectomy surgeries. The additional operating time it would take to perform the block is also negligible, since it is a procedure that can be accomplished in less than 2 minutes.
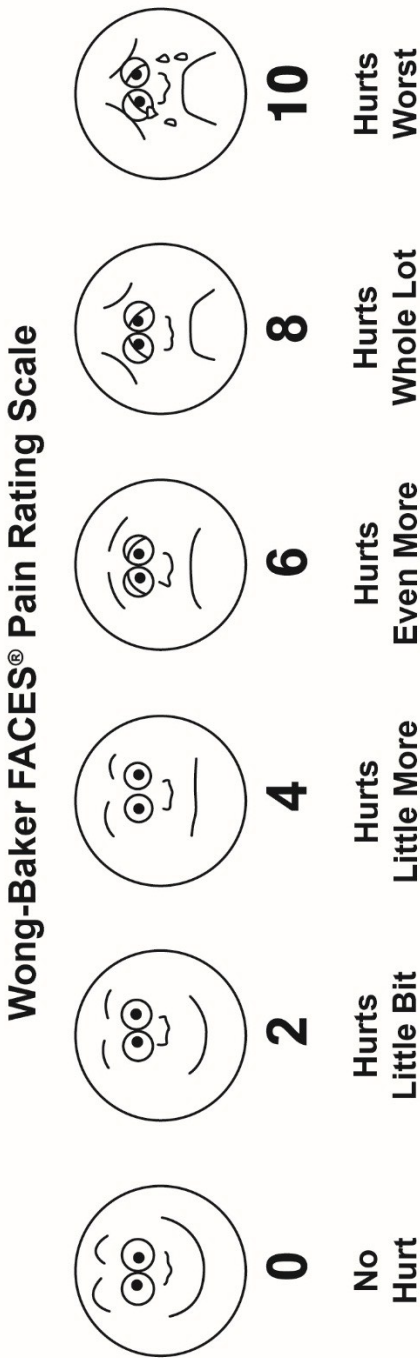
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Appendix 1

Wong-Baker FACES Pain Rating Scale (Used with permission)

Wong-Baker FACES® Pain Rating Scale

0	2	4	6	8	10
No Hurt	Hurts Little Bit	Hurts Little More	Hurts Even More	Hurts Whole Lot	Hurts Worst

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Appendix 2

Example of data collection form

Name:		Age:	MRN:	BMI:

# of CDEL: 0 1 2 3 4 >4	Indication(s) for surgery: AUB Pelvic pain Prolapse Fibroids Other:_____	Additional procedures performed: Oophorectomy Excision of endometriosis Vaginal vault suspension Minilap for tissue extraction Robotic Assistance YES NO

Pain at 30 minutes: 0 1 2 3 4 5 6 7 8 9 10	Pain at 60 minutes: 0 1 2 3 4 5 6 7 8 9 10

Days in hospital: 0 1 2 3 >3	Pathology: No abnormalities Adenomyosis Endometriosis Leiomyoma Other:_____	Spec weight: _____grams	Operating time: _____minutes