Pain Reduction for Office Gynecology Procedures

Abner P. Korn, M.D.
Director of Gynecology
San Francisco General Hospital

Professor
Department of Obstetrics and Gynecology
University of California, San Francisco

Conflict of Interest Disclosure

Abner P. Korn, M.D.
Professor of Obstetrics, Gynecology and RS
University of California, San Francisco

October 23, 2013

I have no financial or commercial interests to disclose.

Acknowledgement

• Thank you to Dr. Karen Meckstroth for sharing some of her slides and expertise on anesthesia for office procedures.

When performing EMB, I use

1. No anesthesia
2. Para/intracervical block only
3. Endometrial block only
4. 2 & 3
Purpose

• To examine evidence for pain reduction in common office based gynecologic procedures
• Add personal experience in cases where no data exists

Pain physiology
• Local anesthesia
• Specific blocks:
  » endometrial
  » paracervical
  » intracervical

Uterine Innervation

• Cervix: sacral nerve (S2-3)
• Corpus: thoracic nerves (T8-10)

Cervical & uterine nerves
Components of pain

- Cognitive-evaluation component: Thought concerning the cause and significance of the pain
- Motivation-affective component: Anxiety, Depression
- Sensory-discriminative component: Location, Intensity

Measuring pain

- No objective pain indicator:
  - Satisfaction
  - Recommend to a friend
  - Choose again
  - % with severe pain
  - Pain scales

Pain scales

- Numeric Rating Scale (NRS)
- Visual Analog Scale (VAS)

Factors associated with discomfort with pelvic exams

- Mean pain 3.2 / 10
- 17% had pain of 6-10 / 10 with pelvic exam
- 30% of those with a history of sexual abuse

Factors associated with high pain:

- Age < 26 (OR=2.75)
- Presence of one or more mental health problems (OR=1.9)
- History of sexual abuse (OR=1.85)
- Dissatisfaction with present sexual life (OR=1.7)
- Negative emotional contact with the examiner (OR=8.2)

Adjusted odds ratios


Strategies for acute pain

Multimodal pain management
- Using more than 1 class of meds or analgesic technique
- eg. local + NSAID + narcotic + benzo + nonpharmacologic strategies

Preemptive analgesia
- Intervention more effective PRIOR to tissue injury
- Increased pain response to subsequent stimulation ("wind-up" or "hyperanalgesia")

Local Anesthesia

• Basic pharmacology:
  » Blockade of Na⁺ channels prevents nerve depolarization
• Generally weak base/HCl salt
• Structure: Aromatic ring (hydrophobic) & tertiary amine (hydrophilic) with ester or amide linkage

Local Anesthesia

Lidocaine (an amide)  Chloroprocaine (an ester)

Potency

• Related to degree of lipid solubility
  » Lipophilicity allows permeation of nerve cells and blockade of transmission
• CNS toxicity is proportional to degree of lipid solubility
  » Light-headedness, tongue numbness, restlessness
  » Slurred speech, excitability, drowsiness, seizures
Cardiac Toxicity

- Predisposes to ventricular arrhythmias
- Depression of myocardium
- Most likely with lipophilic agents such as bupivicaine
- Increased with use of epinephrine

Ester vs. Amide Local Anesthetics

- Esters are easily hydrolyzed and relatively unstable in solution
  » In vivo- by plasma cholinesterase
  » A byproduct of ester metabolism- PABA can cause allergic reactions
- Amides are more stable
  » Undergo enzymatic degradation in the liver (slower than above)


Duration of Action

- Related to plasma protein binding potential
  » Higher protein binding leads to more prolonged association with the nerve membrane

Speed of Onset

- Related to pKₐ (pH at which the drug is in ionized and nonionized forms in equal proportions)
- If the pKₐ is closer to physiologic pH there will be higher concentration of nonionized base, leading to faster onset.
**pH issues**

- Most LA’s have pKa >7
  - LA less effective in acidic environment
  - Alkalization speeds onset of action
  - But epinephrine is unstable in alkaline pH therefore commercially prepared LA+epi is made more acidic - delaying onset


---

**Comparison of Local Anesthetics**

<table>
<thead>
<tr>
<th>Generic (Trade)</th>
<th>Potency</th>
<th>Onset</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bupivacaine (Marcaine)</td>
<td>Strong</td>
<td>Moderate (up to 20 min)</td>
<td>Long (3-6 h)</td>
</tr>
<tr>
<td>Mepivacaine (Carbocaine)</td>
<td>Medium</td>
<td>Fast (4-7 min)</td>
<td>Moderate (3 h)</td>
</tr>
<tr>
<td>Lidocaine (Xylocaine)</td>
<td>Medium</td>
<td>Fast (4-7 min)</td>
<td>Moderate (1-2 h) (~3 h with epi)</td>
</tr>
<tr>
<td>Chloroprocaine (Nesacaine)</td>
<td>Weaker</td>
<td>Fastest</td>
<td>Short (30-60 min)</td>
</tr>
</tbody>
</table>

---

**EMLA**

- 2.5% lidocaine & 2.5% Prilocaine
- Slow onset ~ 40-60 min
- Apply to intact skin >1h, <2h before procedure

---

**Variables in LA performance**

- Agent
- Dosage
- Tissue perfusion (vasodilation)
- Temperature of injection
- pH of injection
- Needle Gauge
- Depth of injection
- Rate of injection
- Distraction (cough, etc.)
Prevent local anesthetic toxicity

- Aspirate for blood prior to injection
- Monitor total dose
- Monitor patient symptoms. Stop after partial dose to check symptoms.
- Use larger volume of more dilute soln
- Inject multiple sites
- Prepare for toxic and allergic reactions

Bottom line

- Many variables- test for anesthesia before beginning procedure.

Paracervical vs. intracervical injection

Superficial vs. deep injection
Intrauterine Anesthesia

- Systematic review of 23 studies
- All use flexible catheter
- 2-3 min pre procedure
- Generally 5cc of 1-2% lidocaine (50-100mg)
  
  » Most consistent effect seen at 100-200mg of lidocaine


Intrauterine Anesthesia

- Evidence of ~2 point on a 10 point scale reduction in pain for:
  
  » EMB & Hysteroscopy


2% lidocaine intrauterine block for endometrial biopsy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>prex</th>
<th>vol</th>
<th>Delay(min)</th>
<th>Pain scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Trolice 00</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>4.7 vs. 9.9 p</td>
</tr>
<tr>
<td>*Dogan 04</td>
<td>+/-NSAID</td>
<td>5</td>
<td>3</td>
<td>5.9/4.6 vs. 7.1 p</td>
</tr>
<tr>
<td>*Güney 06</td>
<td>+miso</td>
<td>5</td>
<td>3</td>
<td>4.9 vs. 6.2 p (premeno)</td>
</tr>
<tr>
<td>*Hui 06</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>2.3 vs. 4.2 p</td>
</tr>
<tr>
<td>*Api 10</td>
<td>+/-NSAID</td>
<td>5</td>
<td>3</td>
<td>3.8 vs. 6.5 p</td>
</tr>
<tr>
<td>*Rattanachaianont 05</td>
<td>+paracervical</td>
<td>5</td>
<td>3</td>
<td>2.3 vs. 4.7 p</td>
</tr>
</tbody>
</table>

Hui. BJOG 2006;113:53-57.  

Intrauterine spray or gel anesthetic for endometrial biopsy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>LA</th>
<th>volume</th>
<th>Delay(min)</th>
<th>Pain scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Einarsson 05</td>
<td>20% benzocaine spray</td>
<td>2 sprays (120mg)</td>
<td>1</td>
<td>7.5 vs. 8.0p</td>
</tr>
<tr>
<td>Kozman 01</td>
<td>2% lidocaine gel</td>
<td>11 ml</td>
<td>3</td>
<td>68%&gt;6 vs. 62%&gt;6p</td>
</tr>
</tbody>
</table>

p = placebo

Intrauterine block for diagnostic and operative hysteroscopy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>Prerx</th>
<th>LA</th>
<th>Vol</th>
<th>Delay (min)</th>
<th>Pain scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zupi 95</td>
<td>-</td>
<td>2% mepiv</td>
<td>5</td>
<td>≥3</td>
<td>3 vs. 2 p</td>
</tr>
<tr>
<td>Cicinelli 97</td>
<td>-</td>
<td>2% mepiv</td>
<td>2</td>
<td>≥5</td>
<td>5.7 vs. 6.7 p</td>
</tr>
<tr>
<td>Lau 00</td>
<td>-</td>
<td>2% lido</td>
<td>5</td>
<td>5</td>
<td>4.3 vs. 4.5 p (NS)</td>
</tr>
<tr>
<td>Gupta 10</td>
<td>+miso</td>
<td>2% lido</td>
<td>5</td>
<td>2</td>
<td>3.8 vs. 5.2 p</td>
</tr>
</tbody>
</table>

p = placebo

Cicinelli. BJOG 1997;104:316-19.

Intrauterine Anesthesia

- Equivocal results for:
  - IUD insertion/removal
  - Saline infusion sonography
  - Hysteroscopic tubal occlusion
  - First trimester abortion


Intrauterine Anesthesia

- Evidence against benefit for:
  - HSG


Paracervical vs. intracervical injection

Paracervical block for diagnostic and operative hysteroscopy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>Prerx</th>
<th>LA</th>
<th>Vol</th>
<th>Site</th>
<th>Delay(min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vercellini 94</td>
<td>-</td>
<td>1% mepiv</td>
<td>10</td>
<td>3,5,7,9</td>
<td>≥5</td>
</tr>
<tr>
<td>*Cicinelli 98</td>
<td>-</td>
<td>1.5% mepiv</td>
<td>10</td>
<td>Uterosacral</td>
<td>≥10</td>
</tr>
<tr>
<td>*Lau 99</td>
<td>-</td>
<td>2% lido</td>
<td>10</td>
<td>3,5,7,9</td>
<td>≥5</td>
</tr>
<tr>
<td>*Giorda 00</td>
<td>-</td>
<td>1% mepiv</td>
<td>20</td>
<td>3,5,7,9</td>
<td>≥5</td>
</tr>
<tr>
<td>*Al Sunadi 07</td>
<td>+</td>
<td>1% lido</td>
<td>8</td>
<td>3.9</td>
<td>≥5+</td>
</tr>
<tr>
<td>*Chundoff 10</td>
<td>+</td>
<td>1% lido</td>
<td>10</td>
<td>4.8</td>
<td>3-5</td>
</tr>
</tbody>
</table>


Paracervical block for diagnostic and operative hysteroscopy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>Prerx</th>
<th>LA</th>
<th>Vol</th>
<th>Site</th>
<th>Delay(min)</th>
<th>Pain scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vercellini 94</td>
<td>-</td>
<td>1% mepiv</td>
<td>10</td>
<td>3,5,7,9</td>
<td>≥5</td>
<td>5.7 vs. 5.2 p (NS)</td>
</tr>
<tr>
<td>*Cicinelli 98</td>
<td>-</td>
<td>1.5% mepiv</td>
<td>10</td>
<td>Uterosacral</td>
<td>1 vs. 4</td>
<td></td>
</tr>
<tr>
<td>*Lau 99</td>
<td>-</td>
<td>2% lido</td>
<td>10</td>
<td>3,5,7,9</td>
<td>≥5</td>
<td>4.8 vs. 5.0 p (NS)</td>
</tr>
<tr>
<td>*Giorda 00</td>
<td>-</td>
<td>1% mepiv</td>
<td>20</td>
<td>3,5,7,9</td>
<td>≥5</td>
<td>5.3 vs. 6.3 p</td>
</tr>
<tr>
<td>*Al Sunadi 07</td>
<td>+</td>
<td>1% lido</td>
<td>8</td>
<td>3.9</td>
<td>≥5+</td>
<td>2.1 vs. 3.2 ic</td>
</tr>
<tr>
<td>*Chundoff 10</td>
<td>+</td>
<td>1% lido</td>
<td>10</td>
<td>4.8</td>
<td>3-5</td>
<td>4.8 vs. 5.8 p</td>
</tr>
</tbody>
</table>

P = placebo, ic= intracervical

Intracervical block for diagnostic and operative hysteroscopy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>Prerx</th>
<th>LA</th>
<th>Vol</th>
<th>Site</th>
<th>Delay(min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadbent 92</td>
<td>-</td>
<td>1% lido/E</td>
<td>10</td>
<td>1,5,7,11</td>
<td>≥5</td>
</tr>
<tr>
<td>*Makris 01</td>
<td>+</td>
<td>3% mepiv</td>
<td>3-9</td>
<td>2,6,10</td>
<td>3</td>
</tr>
<tr>
<td>*Esteve 02</td>
<td>?</td>
<td>2% lido</td>
<td>8</td>
<td>1,5,7,11</td>
<td>NS</td>
</tr>
<tr>
<td>Sagiv 06</td>
<td>-</td>
<td>3% mepiv</td>
<td>10</td>
<td>3.9</td>
<td>2-3</td>
</tr>
</tbody>
</table>

* = benefit vs. placebo


Intracervical block for diagnostic and operative hysteroscopy

<table>
<thead>
<tr>
<th>Author/yr</th>
<th>Prerx</th>
<th>LA</th>
<th>Vol</th>
<th>Site</th>
<th>Comparison*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadbent 92</td>
<td>-</td>
<td>1% lido/E</td>
<td>10</td>
<td>1,5,7,11</td>
<td>No difference</td>
</tr>
<tr>
<td>Makris 01</td>
<td>+</td>
<td>3% mepiv</td>
<td>3-9</td>
<td>2,6,10</td>
<td>Less pain</td>
</tr>
<tr>
<td>Esteve 02</td>
<td>?</td>
<td>2% lido</td>
<td>8</td>
<td>1,5,7,11</td>
<td>Less pain</td>
</tr>
<tr>
<td>Sagiv 06</td>
<td>-</td>
<td>3% mepiv</td>
<td>10</td>
<td>3.9</td>
<td>More pain</td>
</tr>
</tbody>
</table>

* = benefit vs. placebo

Anesthesia for loop excision

- Intracervical and paracervical block equal
- Lidocaine spray (40 mg) (max pain 3) = paracervical injection 1.8 ml 2% lidocaine (36 mg) with epi (max pain 4)


Forced coughing during cervical biopsy

<table>
<thead>
<tr>
<th></th>
<th>Local anesthesia</th>
<th>Forced cough</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schmid</td>
<td>n=68</td>
<td>2.3 (overall score)</td>
<td>3.0</td>
</tr>
<tr>
<td>Naki</td>
<td>n=114</td>
<td>1.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Schmid</td>
<td>1.5 (cervix biopsy)</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Naki</td>
<td>1.3</td>
<td>1.8</td>
<td></td>
</tr>
</tbody>
</table>


Cochrane review: paracervical block for cervical dilation

- Available evidence is insufficient to determine effect.
- Compared to placebo, block reduced abdominal pain by 2-3 points (10 point scale) (RR=.16;95%CI:.06-.74)

Cochrane Database of Systematic Reviews, 2009.

Cochrane review: paracervical block for CIN treatment

- Intracervical injection of LA with a vasoconstrictor seems to be the optimum analgesia for treatment.

Cochrane Database of Systematic Reviews, 2012.
Cochrane review: pain management for hysteroscopic sterilization

- Available evidence is insufficient to determine effect.
- Paracervical block with lidocaine reduced pain during some portions of the procedure compared with saline. Neither LA nor IV sedation reduced overall pain score.

Cochrane Database of Systematic Reviews, 2012.

Conclusion

- We should strive to make procedures as comfortable as possible for our patients
  - Ask about pain scores!
- Consider:
  - Premedication
  - Supportive measures
  - Anesthetic agent
  - Means and sites of administration

Lidocaine

Lidocaine side effects:
- Dizziness, tingling or numbness in face, tinnitus, metallic taste
- Visual symptoms, muscle twitching
- Unconsciousness, convulsions
- Allergic rxns usually to methylparaben
- Single use has no preservative
- Buffer 9:1 with sodium bicarb
- Warming decreases pain with injection
Nonpharmacologic pain management

- Patient control: participation in decisions
- Heat: continuous low abd heat as effective as ibuprofen for dysmenorrhea
- Counseling techniques
- Positive suggestion, guided imagery
- Music
- Acupuncture
- Hypnosis
- “Vocal local”, diversion of attention


Office-based anesthesia (OBA)
- Minimal sedation
- Moderate sedation
- Deep sedation/general anesthesia
- NSAIDs, acetaminophen
- Local anesthesia
- Non-pharmacologic techniques

Goal: safety, quality, patient satisfaction

Perrott. Cur Op in Anesthesiology 2008