Pharmacologic Pain Relief: It’s Use in Labor

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Objectives

• Recognize common medications used in the management of labor pain
• List the expected effects, side effects, and duration of action of medications
• Describe the appropriate nursing care before, during and after the administration of regional anesthesia.
• Recognize two major complications associated with epidural anesthesia

Our Goal

To assist the woman to manage her pain while not interrupting labor or causing harm to her or the baby.

Definitions

• Analgesia - decrease of pain or awareness of pain without loss of consciousness or sensation
• Regional Analgesia - partial sensory blockade, with or without partial motor blockade over a specific region of the body
• Regional Anesthesia – loss of sensation & motor function over a specific region of the body

The Source and Origin of Childbirth Pain

The International Association for the Study of Pain (IASP) has defined pain as: “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”.

2 Kinds of Pain

1st Stage of labor
uterine muscle hypoxia
lactic acid accumulation
cervical stretching
lower uterine segment stretching
traction on ovaries, fallopian tubes, uterine ligaments
pressure on bony pelvis

2nd Stage of labor
Distention
Pressure
Physiologic Responses To Pain

Elevated plasma catecholamines cause:
- Increased maternal cardiac output
- Peripheral vascular resistance
- Decreased uteroplacental perfusion
- Periods of hyperventilation

Physiologic Responses To Pain

Anxiety

Increased catecholamines
Increased metabolism
Increased O2 consumption

Excessive catecholamines = tocolytic effect
reduced contraction strength
reduced duration and coordination

What Can We Do?

Recognize signs of tension
- Frowning, Clenched Fists
- Stiff, straight posture
- Tense arms or legs

Create a relaxed environment during labor
- Control the amount of light, noise, interruptions
- Use calm, slow, soft voice
- Maintain an unhurried demeanor

Use of Pharmaceuticals

Sedative/Hypnotics
Parenteral/Systemic Analgesia
Inhaled Analgesia – Nitrous oxide
Neuraxial Analgesia
  Epidural, Spinal, CSE
### Sedatives/Hypnotics

<table>
<thead>
<tr>
<th>Medication</th>
<th>Effects on Mom</th>
<th>Effects on Baby</th>
<th>Onset &amp; Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nembutal</td>
<td>Induce sleep</td>
<td>Decreased responsiveness and ability to suck</td>
<td>5-10 min to 4 hours</td>
</tr>
<tr>
<td>Phenergan</td>
<td>Sedation, relieve anxiety, decrease nausea &amp; vomiting</td>
<td>None</td>
<td>15-60 min to 12 hrs</td>
</tr>
<tr>
<td>Vistaril</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Common Medications Used in Labor

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Peak Effect</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meperidine</td>
<td>50-100 mg</td>
<td>IM</td>
<td>45 min</td>
<td>2-3 hours</td>
</tr>
<tr>
<td></td>
<td>25-50 mg</td>
<td>IV</td>
<td>5-10 min</td>
<td></td>
</tr>
<tr>
<td>Morphine</td>
<td>5-10 mg</td>
<td>IM</td>
<td>30 min</td>
<td>3-4 hours</td>
</tr>
<tr>
<td></td>
<td>2-5 mg</td>
<td>IV</td>
<td>10 min</td>
<td></td>
</tr>
<tr>
<td>Stadol</td>
<td>1-2 mg</td>
<td>IM</td>
<td>30-60 min</td>
<td>4-6 hours</td>
</tr>
<tr>
<td></td>
<td>1-2 mg</td>
<td>IV</td>
<td>5-10 min</td>
<td></td>
</tr>
<tr>
<td>Nubain</td>
<td>10-20 mg</td>
<td>IM/SQ</td>
<td>15 min</td>
<td>3-6 hours</td>
</tr>
<tr>
<td></td>
<td>10-20 mg</td>
<td>IV</td>
<td>2-3 min</td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>25-50 ug</td>
<td>IV</td>
<td>2-4 min</td>
<td>30-60 minutes</td>
</tr>
</tbody>
</table>

### Common Side Effects of Opioids

**Maternal**
- Allergic reaction
- Respiratory depression
- Nausea and vomiting
- Agitation
- Urinary Retention
- Pruritus
- Delayed gastric emptying

**Fetal**
- Decrease in variability
- Transient sinusoidal fetal heart rate pattern
- Respiratory depression

### Talking points
- Opioids are most widely used systemic medications for labor
- Low-cost, ease of use, no need for special equipment or personnel
- Little scientific evidence that one opioid is superior to another; mostly based on local and personal preference
- Efficacy and incidence of side effects are dose dependent, not drug dependent

### Inhaled Analgesia – Nitrous oxide
Inhaled Analgesia – Nitrous oxide
- Most common inhaled agent used for labor, in the world
- Incidence of use is 62% in the UK, 43% in Canada, less than 1% in the US
- Mechanism not fully understood, thought to enhance the release of endogenous opioid peptides,
- Very rapid onset and offset

Inhaled Analgesia – Nitrous oxide
- Crosses the placenta
- Excreted by the lungs; half life less than 3 minutes
- Rated better than systemic opioids, less than epidural
- Inhalation starts immediately before the contraction, occurs through the contraction, ends with the contraction

Inhaled Analgesia – Nitrous oxide
Common side effects:
- Nausea, vomiting
- Drowsiness
- Dizziness

Regional Anesthesia
- Local Anesthetic
  - Perineal infiltration
  - Pudendal
  - Neuraxial
    - Epidural
    - Spinal

Local Anesthesia
- Perineal infiltration
  - 1% lidocaine
  - Repair
    - Episiotomy
    - Lacerations

Pudendal Nerve Block
- Minor regional block
  - 1% lidocaine
  - Episiotomy
  - Vacuum
**Pudendal Nerve Block**

The sensory and motor innervation of the perineum is derived from the pudendal nerve, which is composed of the anterior primary divisions of the second, third, and fourth sacral nerves. The pudendal nerve’s 3 branches include the following:

- Dorsal nerve of clitoris, which innervates the clitoris
- Perineal branch, which innervates the muscles of the perineum, the skin of the labia majora and labia minora, and the vestibule
- Inferior hemorrhoidal nerve, which innervates the external anal sphincter and the perianal skin

**Pudendal Nerve Block**

- Needle, usually 6 in, 20-22 gauge (ga)
- Syringe with finger ring, 10 mL
- Local anesthetics (eg, lidocaine 1%)
- Sterile gloves

**Neuraxial Analgesia**

- Epidural
- Spinal
- Combined Spinal Epidural

**Epidural**

Continuous Lumbar Epidural

- Complete analgesia for pain of labor and delivery and cesarean delivery
- Decrease anxiety, rest
- Level of anesthesia is dependent on placement of the catheter tip, the dose, and volume of local anesthetic

**Epidural**

Anesthetic agents

- Bupivicaine
- Ropivacaine
- Lidocaine
  + Plus opioid(fentanyl, sufentanil)
Epidural/Spinal Anesthesia

Contraindications

- Patient refusal or inability to cooperate
- Uncorrected maternal hypotension
- Maternal coagulopathy
- Skin infection at site of placement
- Increased intracranial pressure caused by a mass lesion
- Non reassuring fetal status
- Maternal use of once daily dose of low-molecular weight heparin within 12 hours

Epidural-Nursing Assessment

Fetal assessment
Patient desire
Maternal assessment
- Baseline vital signs
- Lab values – platelets, clotting studies
- Maternal history
- Drug allergies
- Status of labor

Epidural Placement

- Patient education
- Physician order/Informed consent
- IV fluid bolus 500-1000mLs LR
- Empty bladder
- Positioning
- Monitoring equipment (BP, O2 Sat, EKG)
- FHR monitoring
- Emergency equipment
**Epidural - Initiation of Block**

- Catheter placement
- Test dose
- Initial dose, titrated to desired effect
- Maintain optimal uterine blood flow
- Continuous monitoring per hospital policy
  - BP, HR, RR, sensory level, motor function,
  - Fetal well being
- Patient teaching - consider early placement

**Nursing Management for Labor Epidural**

- Positioning
- Monitor I & O – Bladder
- Patient comfort - dermatome level/motor function
- Vital signs every 30 minutes after stabilization
  - Check level Q 1 hour
- Labor progress
- Continuous EFM

**Dermatome Levels**

- Assess dermatome levels every hour
- Alcohol swab
- Compare to arm

**Ongoing Management**

- Continuous infusion
- PCEA

**Second Stage Labor Management**

- Labor down
  - Reposition patient frequently
  - Assess for descent
- Turning epidural down or off
  - Increases pain
  - Does not change the rate of assisted delivery
  - Not useful

**Post Partum Management**

- Turn off pump
- Remove epidural tubing – inspect for tip
- Chart appropriately
- Assess for motor blockade prior to ambulation
- Stay with patient during first ambulation
Complications

• Maternal Hypotension
• Total spinal
• Intravascular injection of local anesthetic
• Fever
• Allergic reaction
• Headache
• Itching – central
• Urinary retention

Hypotension

Sympathetic blockade

• Vasodilation
• Pooling of the blood in the extremities

Supine hypotension

• Aorto-caval compression

Supine Hypotension

Management of Maternal Hypotension

• Assume lateral position
• Increase IV fluids
• Monitor maternal vital signs every 2 minutes
• Continuous fetal monitoring
• Oxygen if indicated for FHR or maternal condition
• Notify Anesthesia
• Ephedrine or phenylephrine
• Check anesthesia level

Fever

• Some studies show average rate of temperature increase of 0.1° C per hour of epidural analgesia, after a lag time of 4-5 hours
• Some studies report a fever with an epidural, defined as greater than 38° C

Why Fever?

Dysregulation of body temperature because of decreased sweating and lack of hyperventilation

Parenteral opioids – relatively weak

Inflammatory response, non-infectious interleukin-6, a marker for inflammation
Epidural Fever
If maternal pyrexia occurs, good clinical practice dictates that efforts be made to lower maternal temperature and identify and treat a presumed maternal infection.

Headache?
or Post-Dural Puncture Headache
S/S
• Painful frontal headache
• Worse when sitting or standing
• N/V
Treatment
• Hydration
• Blood patch

Combined Spinal Epidural
Rapid pain relief with less motor blockade
• Opioid injected into the subarachnoid space
• Repeated dosing with epidural catheter
Contraindications
• Fetal bradycardia

AWHONN Position Statement
Non-anesthetist RN should not:
• Insert an epidural catheter
• Administer initial injection, initiate continuous infusion, or re-bolus the epidural
• Increase or decrease the rate of continuous infusion
• Initiate or reinitiate an infusion once it has been stopped
• Manipulate PCEA doses or dosage intervals
• Obtain informed consent

AWHONN Position Statement
An RN may:
• Replace empty infusion syringes with new pre-prepared solutions containing the same medication and concentration, according to standing orders provided by anesthesia care provider

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Conclusion

Pharmacological pain management

• Sedatives, Antiemetics, Narcotics
• Local anesthetics
• Regional anesthetics

Risks/Benefits
Management
Complications