

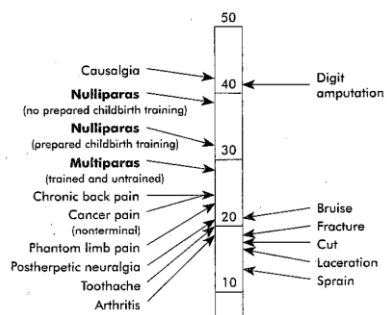
Pain Management for Labour and Delivery

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Existence of Labour Pain

- The existence of chronic pain, which often lacks an obvious outward cause, is now unquestioned
- The existence of labour pain, which is accompanied by visible tissue injury, is often denied

Chronic Pain Syndromes and Labor Pain McGill Questionnaire Pain Scores (PRI) Pain After Accidents

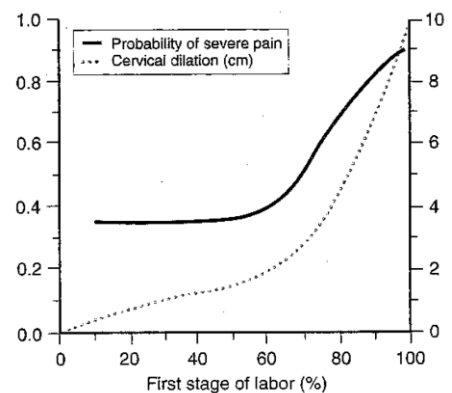


Anatomic Basis of Pain

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- 2nd Stage of Labour:
 - Vaginal surface of cervix, vagina, perineum
 - Requires block of S2-S4

Effects of Pain on the Mother

- Pain
 - increases SNS activity – increasing catecholamines
- Analgesia
 - decreases epinephrine and its B-adrenergic tocolytic effect on the myometrium
 - May convert dysfunctional labour into functional labour

Cardiac and Respiratory Effects

- Labour stresses both systems
- Increased catecholamines
 - Increase in C.O. and SVR
 - Decreased uteroplacental perfusion
- Intermittent pain
 - Stimulates respiration
 - Periods of intermittent hyperventilation
 - Increased oxygen consumption
- Effective analgesia
 - ~50% decrease in catecholamines

Cardiac and Respiratory Effects

- Stresses
 - Well-tolerated by healthy parturients with normal uteroplacental perfusion
 - No concern in uncomplicated labour
 - May lead to maternal or fetal decompensation when disease is present
 - Effective analgesia especially important in such cases

Forms of OB Analgesia and Anesthesia

- 1) Nonpharmacologic
 - 1) Childbirth education and Lamaze
 - 2) Emotional support (husband, friend, doula)
 - 3) Touch and massage
 - 4) Therapeutic heat and cold
 - 5) Hydrotherapy
 - 6) Upright position
 - 7) TENS
 - 8) Acupuncture/ acupressure
 - 9) hypnosis

Forms of OB Analgesia and Anesthesia

2) Systemic Analgesia – Opioids

- Maternal Risks:
 - Nausea, vomiting, delayed gastric emptying, dysphoria, hypoventilation, hypoxemia
- Fetal Risks:
 - Lipid soluble and low molecular weight – therefore will cross placenta
 - Risks of neonatal respiratory depression, ? Neurobehavioural changes, decreased FHR variability

Forms of OB Analgesia and Anesthesia

2) Systemic Analgesia – Opioids

- Routes of administration:
 - IM/SC – variable onset, quality, duration
 - IV – faster onset, predictable levels, titratable
- PCA – potential advantages:
 - Superior pain relief with lower doses
 - Less maternal respiratory depression
 - Less placental transfer
 - Less need for antiemetics
 - Improved patient satisfaction

Forms of OB Analgesia and Anesthesia

2) Systemic Analgesia – Opioids

- Doses:
 - Demerol: 50-100 mg IM or 25-50 mg IV q 2-4 hrs
 - Morphine: 5-10 mg IM or 2-5 mg IV q 3-4 hrs
 - Remifentanyl PCA: basal plus 0.25 ug/kg bolus q 2-5 minutes

Forms of OB Analgesia and Anesthesia

2) Systemic Analgesia – Inhalational Agents:

- Nitrous Oxide
 - Entonox = 50% nitrous and 50% oxygen
 - Efficacy questionable (30-40% of mothers report little to no benefit)
 - Must breathe the entonox from the very beginning to the very end of the contraction
 - Potential maternal hypoxia with additive effects with opioids
 - Environmental pollution

Forms of OB Analgesia and Anesthesia

2) Systemic Analgesia – Inhalational Agents:

- Volatile agents:
 - 0.5% MAC volatile is at least as effective as 50% nitrous mixtures
- Risks:
 - Maternal sedation
 - Maternal amnesia
 - Hypoventilation
 - Loss of protective airway reflexes – pulmonary aspiration

Forms of OB Analgesia and Anesthesia

3) Regional Techniques:

Forms of OB Analgesia and Anesthesia

- 3) Regional Techniques:
- Epidural
 - Spinal
 - Combined spinal epidural

Epidural Analgesia – Indications:

- ACOG and ASA have stated: "in the absence of a medical contraindication, maternal request is a sufficient medical indication for pain relief during labour"

Epidural Analgesia – Indications:

- Epidural analgesia is appropriate for the pain of even early labour
- There is NO minimum cervical dilation required before the administration of epidural analgesia

Epidural Analgesia May Facilitate:

- Atraumatic vaginal breech delivery
- Vaginal delivery of twin infants
- Facilitates the control of BP in pre-eclamptic women

Epidural Analgesia May Facilitate:

- Blunts hemodynamic effects of uterine contractions
 - Increased preload, tachycardia, increased SVR, hypertension, hyperventilation
 - Of concern in patients with other medical complications (eg. Mitral stenosis, intracranial disease, asthma)

Epidural and Spinal Analgesia - Contraindications

Epidural and Spinal Analgesia - Contraindications

- Patient refusal or inability to cooperate
- Increased ICP secondary to a mass lesion
- Skin or soft tissue infection at the site of needle placement
- Frank coagulopathy
- Uncorrected maternal hypovolemia (eg. Hemorrhage)
- Inadequate training in or experience with the technique

Epidural and Spinal Analgesia - Contraindications

- What WBC is ok?
- What platelet count is ok?

Complications of Epidural Analgesia:

- Hypotension:
 - Sympathetic blockade – peripheral vasodilation – decreased venous return – decreased BP and CO
 - Prevention:
 - Volume expansion
 - Avoid aortocaval compression

Complications of Epidural Analgesia:

- Failure:
 - Patient factors:
 - Obesity
 - Abnormal lumbar spine anatomy
 - Depth of epidural space
 - Complete, patchy, one-sided
 - 1.5 – 5%

Complications of Epidural Analgesia:

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Complications of Epidural Analgesia:

- Intravascular Injection of Local:
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 - Restlessness, dizziness, tinnitus, perioral numbness, difficulty speaking, seizures, loss of consciousness
 - CVS:
 - Bradycardia, hypotension, ventricular tachycardia, ventricular fibrillation
 - Bupivacaine - cardiotoxic

Complications of Epidural Analgesia:

- Dural Puncture:
 - ~1 % risk in experienced hands
 - Options:
 - Replace catheter at another space, or intrathecal catheter

Complications of Epidural Analgesia:

- Unexpected High Block:
 - 1:1400 to 1:4500
 - Importance of test dose
 - Potential respiratory and cardiovascular collapse

Complications of Epidural Analgesia:

- Extensive Motor Block:
 - Bothersome for patient
 - May impair maternal expulsive efforts
 - Increases likelihood of mother assuming unnatural position – may increase risk of postpartum back pain
 - Dilute local anesthetics to prevent this
 - ?PCEA

Complications of Epidural Analgesia:

- Urinary Retention
 - Often require urinary catheters

Complications of Epidural Analgesia:

- Epidural Hematoma
 - 1 per 220,000 for spinals
 - 1 per 150,000 for epidurals

Complications of Epidural Analgesia:

- Epidural Abscess
 - 0.2 to 3.7 per 100,000

Complications of Epidural Analgesia:

- Back Pain:
 - Often results from exaggerated lumbar lordosis of pregnancy
 - No significant relationship between the use of epidural analgesia and longterm backache

Complications of Epidural Analgesia:

- Peripheral nerve injury
 - 3.5 per 10,000
 - The majority resolve within 3 months
- Paraplegia
 - 1:250,000

Complications of Epidural Analgesia:

- Prolongation of labour
 - 2nd stage – approx. 30 minutes
- Increased incidence of c-section
 - Varying results
 - Consensus is: No
 - Instrumental delivery: up to 25% increased risk

Options for Anesthesia for C-Section:

Options for Anesthesia for C-Section:

- 1) Epidural
 - Usually a "top-up"
 - Often not as complete pain relief as a spinal
 - Takes time
 - Ability to give more local anesthetic if procedure lengthy

Options for Anesthesia for C-Section:

Options for Anesthesia for C-Section:

- 2) Spinal
 - Single shot
 - Rapid
 - Usually dense block
 - No opportunity to "top up"

- 3) General Anesthetic
 - Increased risks due to physiologic changes of pregnancy
 - Fastest option in an emergency
 - Controlled airway in cases of potential bleeding (eg. complete placenta previa)
 - Least commonly used

Anesthetic Implications of Maternal Physiologic Changes during General Anesthesia

Anesthetic Implications of Maternal Physiologic Changes during General Anesthesia

- Endotracheal Intubation
 - Smaller endotracheal tube required
 - Increased risk of trauma
 - Increased risk of failed intubation
 - Increased risk of pulmonary aspiration of gastric contents

- Maternal oxygenation
 - Increased physiologic shunt when supine
 - Increased rate of denitrogenation (decreased FRC)
 - Increased rate of desaturation during apnea (decreased FRC and increased oxygen consumption)

Anesthetic Implications of Maternal Physiologic Changes during General Anesthesia

- Maternal ventilation
 - Increased minute ventilation required

Aspiration:

- ~ 3x increased risk in pregnancy
- Mechanisms:
 - 1) Increased progesterone production:
 - 1) Decreased gastrointestinal motility
 - 2) Slower absorption of food
 - 3) Gastric secretions are more acidic
 - 4) Lower esophageal sphincter tone is decreased

Aspiration:

- ~ 3x increased risk in pregnancy
- Mechanisms:
 - 2) Uterine growth
 - Upward displacement and rotation of stomach
 - Increased pressure and delay in gastric emptying

Aspiration:

- ~ 3x increased risk in pregnancy
- Mechanisms:
 - 3) Pain, anxiety, and opioids may further exacerbate this delay

Preventing Aspiration:

- 1) Avoidance of GA
- 2) Performance of awake intubation in a patient with a difficult airway
- 3) Application of cricoid pressure, rapid sequence induction, and intubation with a cuffed ETT
- 4) Confirm full return of neuromuscular function and only extubate when fully awake and responding to verbal commands

Preventing Aspiration:

- 5) Pharmacologic therapy:
 - 1) Non-particulate antacid – sodium citrate
 - 2) Metoclopramide
 - 1) Accelerates gastric emptying
 - 2) Increases lower esophageal sphincter tone
 - 3) Antiemetic effects
 - 3) H₂ – receptor antagonist
 - Increases gastric pH
 - Eg. Ranitidine 50 mg IV 30 mins pre-op

Preparation for Analgesia

- Maternal History:
 - Eg. Resp or cardiac disease, neurologic disorders, bleeding disorders, etc.
- Obstetrical History:
 - Multiple gestation, pre-eclampsia, GDM, previa
- NPO status
- Previous Anesthetics

Preparation for Analgesia

- Physical examination
 - Vitals, including FHR
 - Airway exam (can change throughout labour)
 - CVS
 - Resp
 - Back exam (infections, scoliosis, tattoos)

Preparation for Analgesia

- Labwork:
 - CBC
 - Additional tests based on history

Preparation for Analgesia

- Options:
 - Nonpharmacologic
 - Systemic opioids
 - Inhalationals
 - Regional
 - Epidural
 - Spinal
 - Combined spinal epidural
 - General Anesthesia

Preparation for Analgesia

- Risks and benefits
- Questions