CSE for labour analgesia

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Lecture outline

- CSE labour analgesia:
  - indications / technique
  - advantages / disadvantages
  - ambulation
  - recent developments
Techniques for labour analgesia

- Epidural catheter
- Single shot spinal
- Spinal microcatheter
- Combined spinal epidural (CSE)
Epidural

- Slow onset time (15 min)
- Loading dose
  - low dose mixture: bupivacaine / fentanyl
- Maintenance regimen
  - low dose mixture: bupivacaine / fentanyl
  - bolus, continuous infusion, PCEA, automatic
Combined spinal epidural

(spinal) Needle-through-Needle (epidural)
Indications for CSE

- Labour pain
  - early
  - late / 2nd stage ✓
  - PG induction / oxytocin
- Rapid delivery / difficult (OP position)
- Failed regional block
Low dose CSE (labour)

- rapid analgesia
- maternal distress
- advanced labour
- sacral analgesia
Typical CSE regimen

- **Spinal**
  - 2.5 mg bupivacaine + 5 - 15 µg fentanyl
  - 3 ml of epidural low dose mixture

- **Epidural** *(low dose mix = 0.1 % bupiv + 2 µg/ml fentanyl)*
  - intermittent bolus / continuous infusion
  - PCEA
  - automated intermittent bolus
CSE vs. epidural

Regional labour analgesia

CSE

Epidural
CSE vs. epidural

Regional labour analgesia

CSE
- Spinal starter
  - 2.5 mg bupiv + 5-15 µg fentanyl
  - 2.5 mg bupiv + 2.5 µg sufentanil
  - 3ml low dose epidural mixture
- Epidural topup
  - 15ml low dose epidural mixture
  - 0.1% bupiv + 2µg/ml fentanyl
  - 0.0625% bupiv + 0.25µg/ml sufentanil
- CI / PCEA / automatic bolus

Epidural
CSE vs. epidural

Regional labour analgesia

CSE
- **Spinal starter**
  - 2.5 mg bupiv + 25 µg fentanyl
  - 2.5 mg bupiv + 2.5 µg sufentanil
  - 3ml low dose epidural mixture
- **Epidural topup**
  - 15ml low dose epidural mixture
  - 0.1% bupiv + 2µg/ml fentanyl
  - 0.0625% bupiv + 0.25µg/ml sufentanil
- CI / PCEA / automatic bolus

Epidural
- **Epidural starter**
  - 15ml low dose epidural mixture
  - 0.1% bupiv + 2µg/ml fentanyl
  - 0.0625% bupiv + 0.25µg/ml sufentanil
- **Epidural topup**
  - 15ml low dose epidural mixture
- CI / PCEA / automatic bolus
Automatic epidural bolus

Yvonne Lim / Alex Sia - IJOA ’05 - Automated epidural bolus vs continuous infusion

A new way of giving epidural labor analgesia

Not: nurse bolus on demand / continuous infusion / PCEA

Automatic epidural bolus at regular intervals
Lecture outline

- CSE labour analgesia:
  - indications / technique
  - advantages / disadvantages
  - ambulation / safety
  - recent developments
CSE: advantages / disadvantages

Advantages:
- Efficacy: speed, sacral block
- Obstetric outcome: ↑ normal deliveries
- Ambulation: ↓ lower limb motor block

Disadvantages:
- Failure / technical issues: headache (PDPH)
- Testing of epidural catheter: fetal bradycardia
- Miscellaneous: meningitis, nerve damage, metallic fragments, catheter migration
CSE: advantages / disadvantages

- **Efficacy**
  - speed, sacral blk

- **Obstetric outcome**
  - ↑ normal deliveries

- **Ambulation**
  - ↓ lower limb motor blk

- **Failure / technical issues**
  - Headache (PDPH)

- **Testing of epidural catheter**
  - Fetal bradycardia

- **Miscellaneous**
  - meningitis, nerve damage, metallic fragments, catheter migration
CSE: advantages / disadvantages

Advantages
- Efficacy
  - speed, sacral blk
- Obstetric outcome
  - ↑ normal deliveries
- Ambulation
  - ↓ lower limb motor blk

Disadvantages
- Failure / technical issues
- Headache (PDPH)
- Testing of epidural catheter
- Fetal bradycardia
- Miscellaneous
  - meningitis, nerve damage, pruritus
  - metallic fragments, catheter migration
CSE: advantages

Advantages

- Efficacy
- Obstetric outcome
- Ambulation

- Fast onset time: < 5-10 min
- ↑ Sacral analgesia
- Late 1\textsuperscript{st} stage / 2\textsuperscript{nd} stage
- Distressed mothers
- Failed epidural
CSE: advantages

- Efficacy
  - Epid LDM straight after spinal
    - ↓ breakthrough pain
    - ↓ bupivacaine requirements

- Obstetric outcome

- Ambulation
CSE: advantages

Advantages

- Efficacy
  - no differences!

- Obstetric outcome
  - normal deliveries
  - forceps / ventouse
  - caesarean section

- Ambulation
CSE: advantages

Advantages

- Efficacy
- Obstetric outcome
- Ambulation

- possible also with epidural
- both ↓ motor block
- safety issues
- balance function
Walking CSE / epidural
Ambulation & obstetric outcome

- Nikodem
  - Cochrane ’93 / ’94
- Gupta
  - Cochrane ’03
- Nageotte
  - NEJ M ’97
- Bloom
  - NEJ M ’98
- Collis
  - Anaesthesia ’99
- Tsen
  - Anesthesiology ’99
- Karraz
  - Int J Gyne & Obst ’03
- Frenea
  - Anesth Analg ’04
Ambulation & obstetric outcome

- Collis ’99
  - CSE: ambulant vs. lying
- Tsen ’99
  - CSE vs. epidural: ↑ cervical dilatation with CSE
- Karraz ’03 / Vallejo ’01
  - epidural: ambulant vs. lying
- Frenea ’04
  - epidural: prolonged ambulation
Is walking safe after low dose CSE / epidural?

Are falls more likely?
Balance function

somatosensory / visual / vestibular
Can you prevent a fall with a test?

- Lower limb motor power
  - straight leg raising against resistance
- Dorsal column function
  - proprioception / Romberg’s test
  - vibration
- Partial knee bend
- Step on/off foot stool
CDP: Computerized Dynamic Posturography
Posturography: Balance Master 6.1
Davies ’02 (Anesthesiology)

Balance Master 6.1

Pregnant control - no epidural
Labouring mother 30 min after CSE
Davies ’02 (Anesthesiology)

- 50 non-pregnant controls vs 50 pregnant controls vs 50 pregnant after low dose CSE

- Non-pregnant controls better scores in 6/13 tests vs pregnant and CSE gps

- No difference between CSE and pregnant control!
Summary: balance function after CSE

- Pregnant women ↓ balance function

- Labour CSE (spinal) does not affect balance

- Epidural top-ups may ↓ balance function
CSE: disadvantages

- Failure
  - ↓ with experience: < 0.4%

- PDPH
- Epidural testing
- Fetal bradycardia

- Needle movement
- Inadequate drug dose
CSE: disadvantages

Disadvantages

- Failure
- PDPH
- Epidural testing
- Fetal bradycardia

- Headache risk < 0.1%
- Use pencilpoint needles
- Avoid multiple passes of spinal needle
CSE: disadvantages

- Failure
- PDPH
- Epidural testing
- Fetal bradycardia

- can an epidural catheter be tested after spinal?
- epidural test dose not reliable
- use multi-hole epidural catheter
- aspiration detects most iv catheters
- fractionate high dose LA for caesarean section
CSE: disadvantages

- Failure
- PDPH
- Epidural testing
- Fetal bradycardia

CSE = Epidural

- CTG
- Cord blood gases
- Apgar scores
CSE & fetal bradycardia

- Mardirosoff (2002)
  - metaanalysis
  - ↑ fetal bradycardia with spinal opioids

- Van de Velde (2004)
  - epidural vs. CSE - high / low dose sufentanil
  - ↑ spinal opioid dose → ↑ fetal bradycardia (7µg sufent)

- Rapid analgesia → epinephrine / norepinephrine imbalance → uterine hypertonus (?)
CSE : disadvantages

Disadvantages

Miscellaneous

Meningitis
Nerve damage
Catheter migration
Metallic fragments
CSE: disadvantages

Disadvantages

Miscellaneous

- Meningitis
- Nerve damage
- Catheter migration
- Metallic fragments
CSE: disadvantages

Disadvantages

Miscellaneous

Meningitis  Nerve damage  Catheter migration  Metallic fragments

spinal needle puncture
epidural catheter radius
Disadvantages

- Meningitis
- Nerve damage
- Catheter migration
- Metallic fragments
CSE: disadvantages

- Pruritus
  - ↑ with spinal opioids
  - dose dependent
  - treatment available

- Respiratory depression
  - very rare event / dose dependent
  - high dose sufentanil - early days of CSE!
CSE - recent developments

- Bupivacaine vs. levobupivacaine vs. ropivacaine
  - Camorcia '05 / Van de Velde '07

- Effect of spinal injection volume
  - Parpaglioni '05; ↑ injection vol → ↑ efficacy

- CSE vs. epidural – analgesia outcomes
  - Thomas '05; no difference
CSE - recent developments

- Bupivacaine vs. levobupivacaine vs. ropivacaine
  - Camorcia '05 / Van de Velde '07
Bupiv vs. levo vs. ropiv

- Camorcia
  - MLAD / ED50 study
  - potency: bupiv > levo > ropiv

- Van de Velde
  - full dose response study (ED95 + ED50)
  - potency: bupiv > levo & ropiv
CSE - recent developments

Bupivacaine vs. levobupivacaine vs. ropivacaine
Camorcia ‘05 / Van de Velde ‘07

- Effect of spinal injection volume
  - Parpaglioni ‘05

CSE vs. epidural outcomes
Thomas ‘05
Spinal levobupivacaine at different volumes (2.5, 5 & 10ml; n=93)

- Up / down sequential allocation
- ↑ injection volume → ↓ MLAD
- ↑ vol → ↑ effect
CSE - recent developments

Bupivacaine vs. levobupivacaine vs. ropivacaine
Camorcia ‘05 / Van de Velde ‘07

Effect of spinal injection volume
Parpaglioni ‘05

- CSE vs. epidural - outcomes
  - Thomas ‘05
CSE - outcome

Thomas - Anesthesiology - Does dural puncture during CSE improve epid function?

- CSE **without** spinal drug injection vs epidural catheter only technique
- PCEA analgesia with low dose fent/bupiv
- No group differences:
  - epidural catheter manipulation / replacement
  - unilateral blocks / analgesia quality
CSE - the future?

- Epidurals for early labour
- CSE
  - late labour / maternal distress
  - difficult delivery / failed epidural
- Spinal volume effects
- Analgesia maintenance (automated bolus)
Thank you!