Current Management of Labour Analgesia – Epidural or CSE, Bolus or Infusions?

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Can I have more kangaroos please?
Keeping perspective…

- ALL techniques for initiation and maintenance of neuraxial analgesia in labour work…
  …really well!
  …really often!

- So not surprising that showing differences between techniques is challenging and hence there is wide variation in practice

- In such areas ‘best evidence’ may fail to give you the answers to help define all your practice
History of CSE for labour analgesia

- From a time of ‘traditional’ epidurals
- Concern about obstetric intervention – slowing labour, oxytocin augmentation, instrumental delivery, Caesarean section rate
- Mobilisation in labour was perceived as desirable and worthwhile
- ‘Low dose’ epidural solutions worked fine without the spinal component and were mobile – this helped define new epidural standard
So what are we actually comparing?

- CSE - bupivacaine (up to 2.5mg) with fentanyl (up to 25mcg) then bupivacaine 0.1% with fentanyl 2mcg/ml (LDM) epidurally by infusion/bolus

- Epidural - up to 20 mls LDM then as above

- Much confusion exists over claimed benefits of CSE and over risks - both have been exaggerated
CSE has some clear advantages

- Faster onset - is 5 minutes is clinically important?

- Fewer early failures - where epidural has higher failure rate such as scoliosis, obesity, poor LOR or for the inexperienced epiduralist

- Reliable sacral analgesia - when sacral blockade is required or for rapidly progressing labour
CSE might have other benefits but many are inconsistently demonstrated in studies

- Fewer rescue top-ups?
- Reduced need for late resiting of epidural?
- Fewer failures when topping up for Caesarean?

- Less motor block??
- Higher maternal satisfaction??

- Anaesthetist satisfaction?
CSE has some clear disadvantages

- Pruritis more frequent and severe
- Early fetal bradycardia more frequently seen
  
  Both are associated with spinal opioid, and possibly dose-related.

- Dural Puncture Epidural - CSE with no spinal injection
CSE might have other theoretical or potential problems but evidence lacking

- Higher risk of post dural puncture headache?
- Higher risk of meningitis?
- More maternal hypotension??
- Conus damage??
- Drug error or contamination??
- ‘Untested’ epidural catheter??
- Higher risk of neurological injury??
NAP 3 – what should I conclude?

- ‘Considering the relatively small number of combined spinal epidurals performed the number of associated reports of harm is concerning’
- ‘Two of the deaths followed its use’

- 4 of the 30 ‘pessimistic’ permanent harm cases followed CSE, and only 4 of the 30 were obstetric (2 after CSE classified as 1 nerve injury and 1 miscellaneous)
- Epidural 0-3.4 vs CSE 1-22 (or 0-11.8 optimistic) harm events per 100,000 in obstetrics based on 161,000 and 25,000 cases
- 1 death due to iv bupivacaine administered on ICU
- The other death followed a bupivacaine ‘epidural’ infusion running on an unmonitored patient after inadvertent dural tap
Maintenance – bolus or infusions?

- Dilute local anaesthetic solutions with opioid reduce negative impacts on labour/obstetric outcome
- Intermittent top-ups (boluses) were used first
- Infusions then followed in USA - no midwife top-ups!
- Technology then allowed parturient controlled epidural drug administration, with increasing sophistication now including automated boluses and computer control

- No single method or regimen been shown to be clearly ‘superior’ to another so wide variation in practice
- What is ‘superior’ depends on your goals!
**Physical characteristics of infusion dosing**

- Infusions deliver more drug through the proximal hole of multiport catheters.
- Uniport catheters are associated with a greater incidence of inadequate analgesia and unilateral blockade.
Simulated epidural spread: continuous infusion vs ‘intermittent infusion’ i.e. bolus
Intermittent Top-ups (vs Infusions)

Pros:
- Midwife involved
- Dose-sparing
- Less motor block

Cons:
- Time-consuming for midwife or anesthesiologist
- Drug error potential
- Concerns about controlled drug access
Physical characteristics of bolus dosing

- Infusions deliver more drug through the proximal hole of multiport catheters
- Uniport catheters are associated with a greater incidence of inadequate analgesia and unilateral blockade
- But intermittent top-ups are a declining method of maintenance for various reasons including midwifery workload, controlled drug issues and suggested benefits of newer methods like PCEA
What are UK departments using?

- Postal survey in 1999:
  - 41% top-ups, 48% infusions, 3% PCEA

- London telephone survey in 2004:
  - 60% top-ups, 29% infusions, 11% PCEA

- OAA survey in 2007:
  - 20% PCEA

- OAA survey in 2012:
  - 50% PCEA
Maintenance – bolus or infusions?

- Many regimens:
  - Parturient Bolus: 3 to 10 mls
  - Lockout: 5 to 20 mins
  - Background Infusion: 0 to 10 mls/hr
  - Hourly Maximum: 20 to 30 mls

- Background infusion *may* reduce rescue, and some studies support larger bolus volumes
Maintenance - programmed intermittent epidural bolus or background infusions?

- Many regimens:
  - Parturient Bolus: 3 to 10 mls
  - Lockout: 5 to 20 mins
  - Background Infusion: 0 to 10 mls/hr
  - Programmed Intermittent Bolus: 0 to 10 mls
  - Hourly Maximum: 20 to 30 mls

- Background infusion *may* reduce rescue, and some studies support larger bolus volumes
Smiths CADD-Solis Pump
‘PCEA plus’

- Programmed intermittent epidural boluses (aka: automated mandatory boluses)

- Small reduction in bupivacaine dosing compared to background infusion

- Higher maternal satisfaction

- Fewer rescue top-ups?

- Reduction in motor block?

- No consistent effect on obstetric outcome (yet?)
What is your ultimate goal?

- ‘Standard’ care few can criticise?
- Individualised care which demands
  - greater knowledge, experience and understanding
  - a flexible approach
  - a willingness to take a fresh look at risk and benefit for each patient or unit
  - a preparedness to defend a ‘guideline not protocol’ approach
What are my conclusions?

- Initiate with CSE in selected parturients
- Maintain by midwife bolus or PCEA with generous volume bolus by parturient and pump
Thank you for your attention.

- Initiate with CSE in selected parturients
- Maintain by midwife bolus or PCEA with generous volume bolus by parturient and pump
- Further reading:
  - references (including the most recent and relevant meta-analyses and reviews*) follow
References 1

References 2

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