

Epidural Lidocaine Versus Dural Puncture Epidural Bupivacaine for Initiation of Labor Analgesia: A Randomized Clinical Trial

Xin-Zhong Chen, M.D

Background

- The dural puncture epidural (DPE) technique provides **faster** onset of labor analgesia than epidural analgesia (EA).
- DPE carries potential risks associated with dural breach and higher costs because of the requirement of an additional spinal needle.
- Rapid epidural analgesic onset can be achieved using a local anesthetic with a lower pKa, such as lidocaine.

Hypothesis

Initiating labor analgesia with EA using lidocaine would provide a faster onset than DPE using bupivacaine.

- This is a *prospective, randomized, double-blind, two-arm parallel controlled* clinical trial.
- Patients were randomly assigned to
 - bupivacaine DPE group (n=60)
 - lidocaine EA group (n=60)
- **Analgesia initiation:**
 - DPE group: 20 mL of 0.1% bupivacaine plus 0.3 µg/mL sufentanil
 - EA group: 20 mL of 0.57% lidocaine plus 0.3 µg/mL sufentanil.
- **Analgesia maintenance:** 0.1% bupivacaine with 0.3 µg/mL sufentanil.
- **Primary outcome:** *time to effective analgesia*
(numeric rating scale pain score ≤ 1 within 30 min)

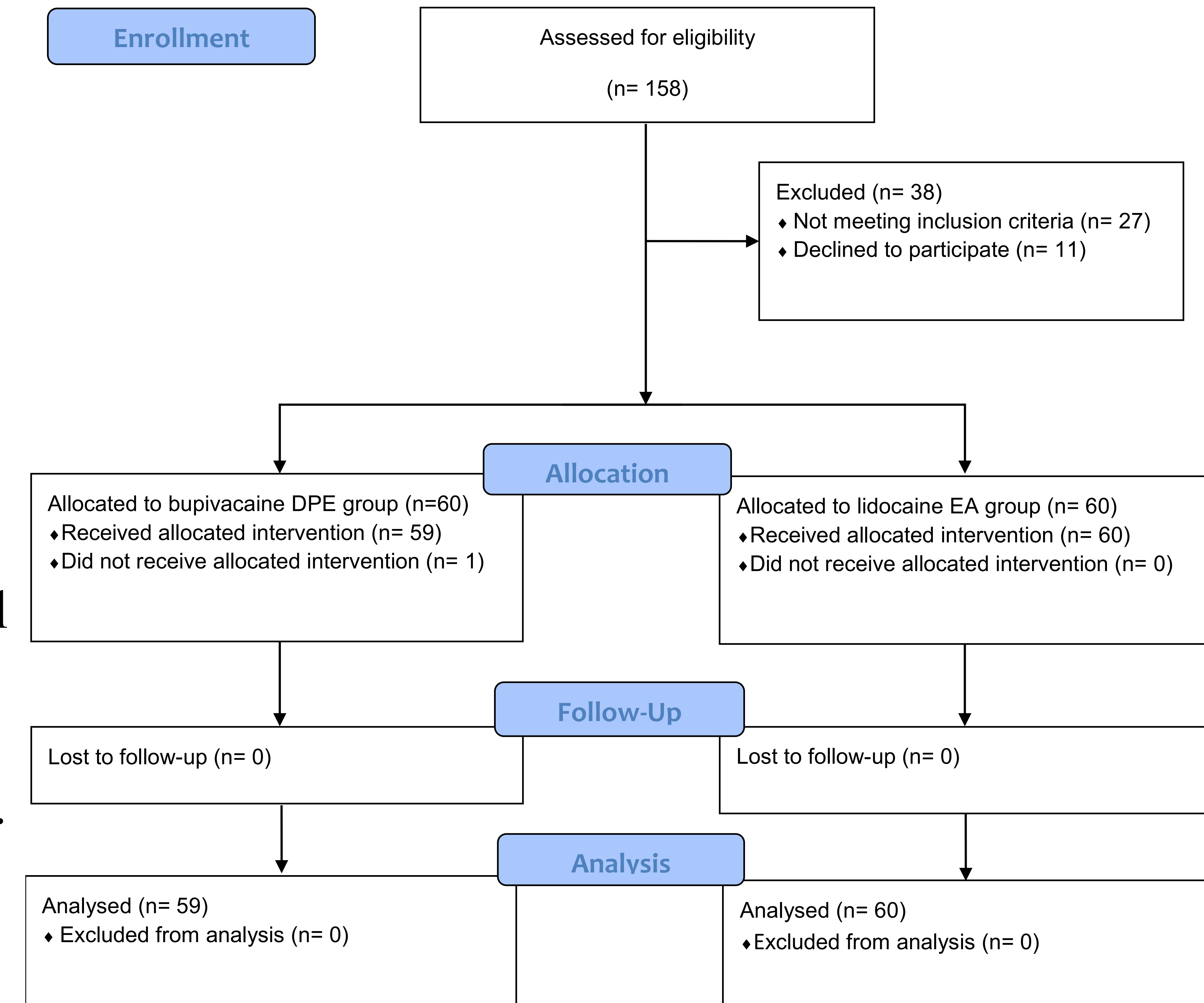


Figure 1. CONSORT flow diagram.

Time to effective analgesia :

- lidocaine EA—Median 15min, IQR [12 - 21] min
- bupivacaine DPE— Median 24 min, IQR [18-60] min ($P < 0.001$)

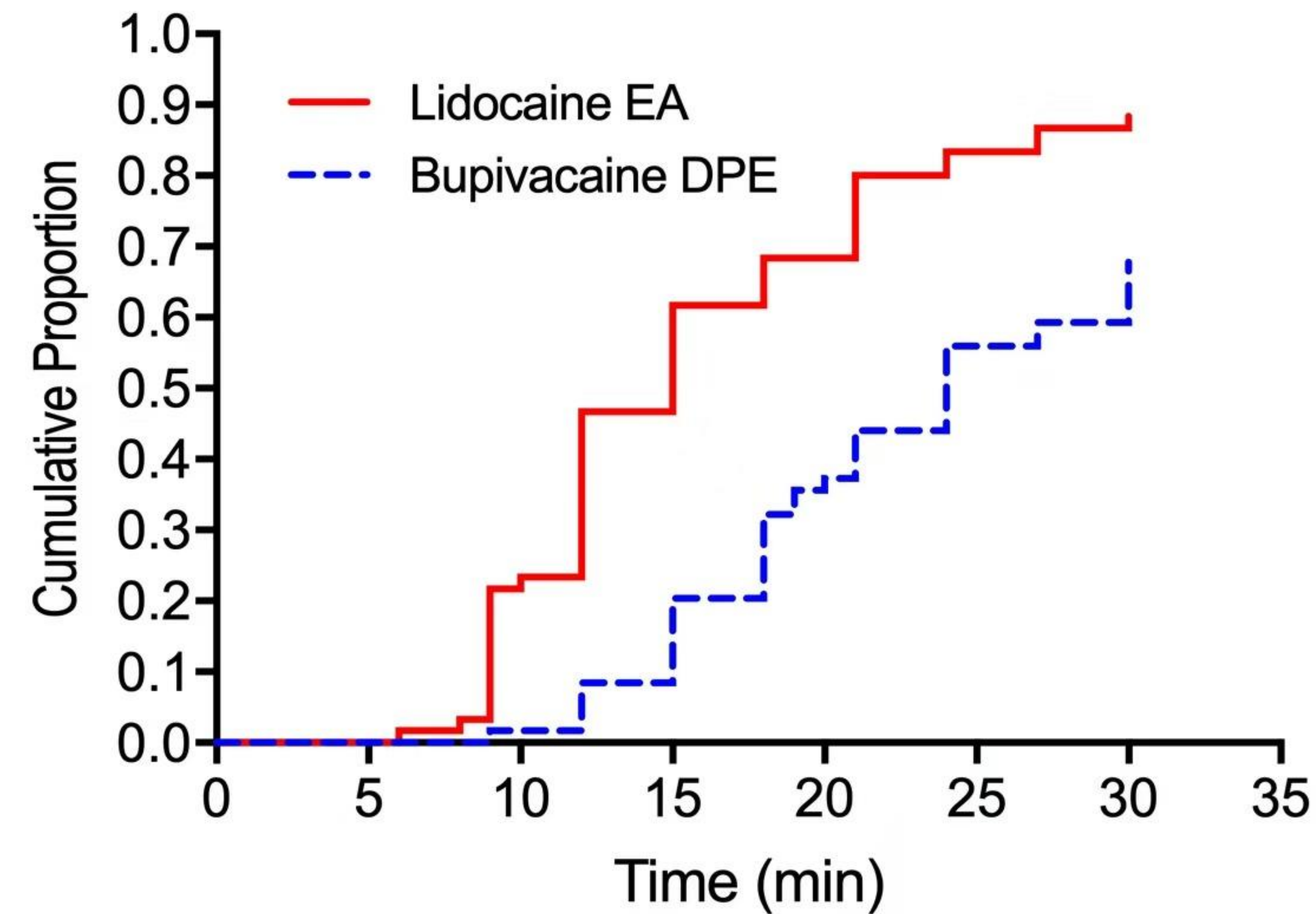


Figure 2. Kaplan Meier survival curves showing cumulative proportion of patients in each group with effective analgesia.

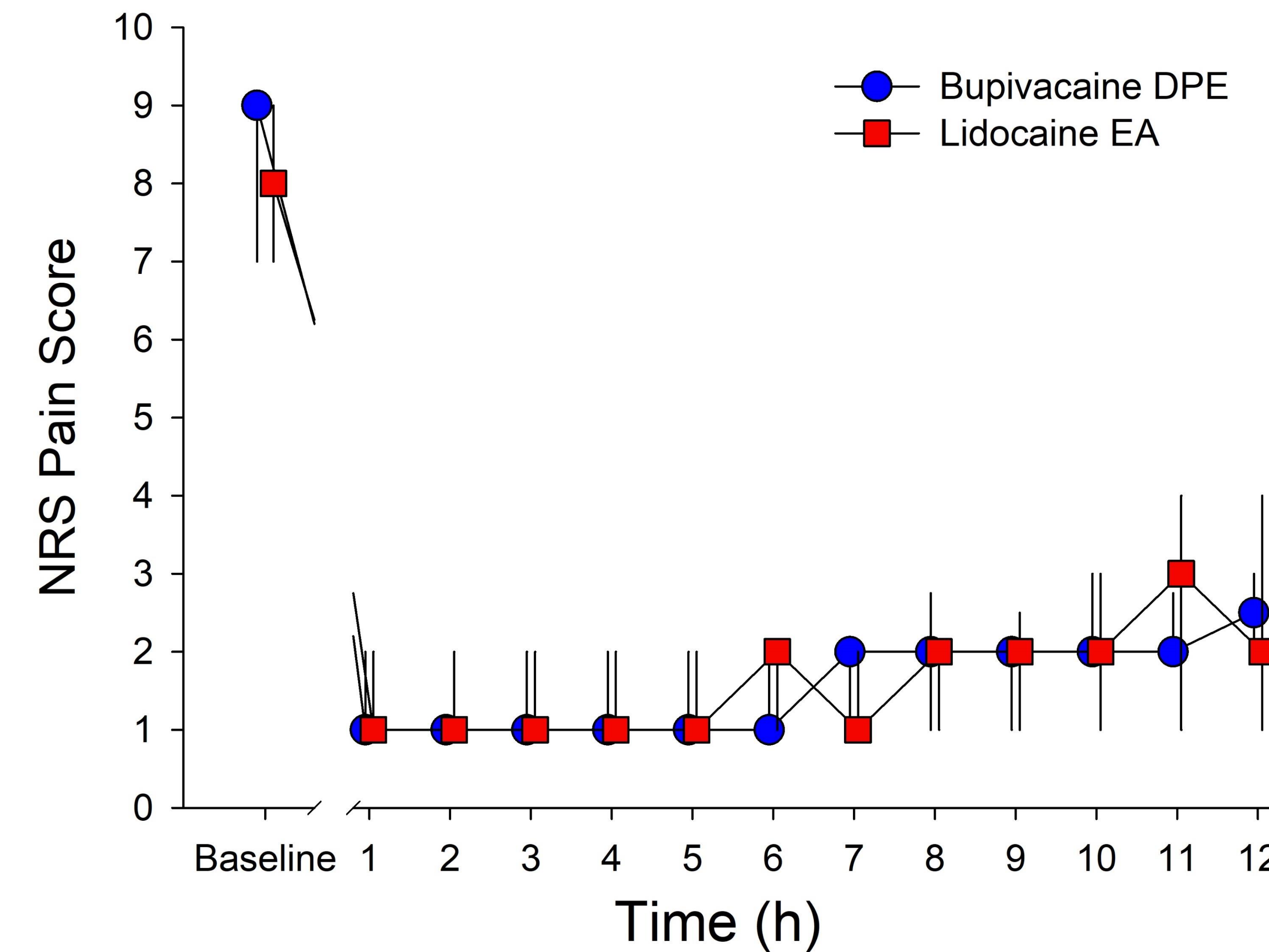


Figure 3. Numeric rating scale pain scores versus time during maintenance of epidural analgesia.

Key findings:

- Initiating labor analgesia using lidocaine with sufentanil by EA resulted in faster onset of analgesia compared with using bupivacaine with sufentanil by DPE, with no impact on labor or neonatal outcomes.
- There are no differences between groups in overall pain scores and motor block during the maintenance of analgesia.

Implication:

- For rapid onset, initiating labor analgesia using lidocaine EA is simpler and more cost-effective than DPE using bupivacaine, with comparable labor and neonatal outcomes.

Conclusion: Lidocaine with sufentanil administered by EA provided significantly faster onset of labor analgesia than bupivacaine with sufentanil administered via DPE.

Acknowledgments: I'd like to acknowledge the research team, and especially Professor Warwick D. Ngan Kee for his invaluable guidance.