



Introducing programmed intermittent epidural bolus (PIEB) technique in a large maternity unit - *a quality improvement project*



Objectives

Epidural is the gold standard for labour analgesia [1]. There is currently no universal consensus on epidural regime. In Cardiff, manual syringe bolus injection (MSBI) technique has been used for decades. In October 2023, we transitioned from Luer to NRFit devices. There was a decision to implement Programmed Intermittent Epidural Bolus (PIEB) technique. It is well documented that PIEB is superior to continuous epidural infusion (CEI) [2,3]. There is limited evidence comparing MSBI to PIEB. Our project aimed to determine if PIEB technique is comparable to MSBI in our maternity unit.

Methods

Retrospective analysis of >200 epidurals for labour comparing 3 different regimes

- MSBI 0.1% bupivacaine + 2ug/ml fentanyl
- PIEB 0.1% levobupivacaine + 2ug/ml fentanyl
- PIEB 0.1% bupivacaine 2ug/ml fentanyl

Outcomes

The primary outcome measures were:

- Breakthrough pain (extra clinical boluses)
- Local anaesthetic mass/hour
- Maternal satisfaction scores (as a verbal rating score)

Results

	MSBI, n=103 (Bupivacaine)	PIEB, n=47 (Levobupivacaine)	PIEB, n=56 (Bupivacaine)
Clinician boluses (%)	54	68	57
Average hourly local anaesthetic mass (mg/hr)	16.4	14.8	13.2
Maternal satisfaction (VRS)	9.2/10	8.4/10	8.8/10

Conclusions

Our results show that **PIEB is comparable to MSBI**, in fact **PIEB used less local anaesthetic compared to MSBI**. There was a high rate of breakthrough pain across all groups, despite this there was also a high maternal satisfaction reported across all regimes. Notably, epidurals using Levobupivacaine are less effective but requiring a higher LA mass per hour and more clinician boluses. Overall, clearly none of these regimes are optimal and evidently **more than 10ml/hr LA required**.

Recommendations



Continue with PIEB



New PIEB regime includes 10ml PCEA with reduced lock out



Aim to bring down extra clinician boluses



Reduce anaesthetic workload down whilst maintaining maternal satisfaction

References

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2. Nunes, J., Nunes, S., Veiga, M., Cortez, M. and Seifert, I. (2016). A prospective, randomized, blinded-endpoint, controlled study – continuous epidural infusion versus programmed intermittent epidural bolus in labor analgesia. *Brazilian Journal of Anesthesiology (English Edition)*, 66(5), pp.439–444. doi:https://doi.org/10.1016/j.bjane.2014.12.006.
3. Riley, E.T. and Carvalho, B. (2017). Programmed Intermittent Epidural Boluses (PIEB) for Maintenance of Labor Analgesia: A Superior Technique to Continuous Epidural Infusion? *Turkish Journal of Anesthesia and Reanimation*, 45(2), pp.65–66. doi:https://doi.org/10.5152/tjar.2017.09031.