

Effect of intrathecal hyperbaric bupivacaine dose on the duration of urinary catheterization for patients who underwent cesarean delivery: a retrospective study

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Introduction

- A meta-analysis of observational studies found that duration of urinary tract catheterization was associated with the risk of a catheter-associated urinary tract infection (CAUTI).¹
- The relationship between dose of intrathecal local anesthetic and the duration of urinary catheterization is unknown.
- We hypothesized that patients of similar height who received a higher dose of intrathecal hyperbaric bupivacaine (HB) would have a longer duration of urinary catheterization.



Methods

- Patients who had caesarean deliveries at our hospital from February 1, 2020, to January 30, 2021, who did not have a neuraxial labor analgesic and had a single injection spinal or combined spinal epidural anesthetic for CD were eligible for inclusion.
- We considered a HB intrathecal dose of 10.5 mg or less to be “low” and 12 mg or more to be “high”.
- We performed propensity matching on eligible patients based on height and HB dose.
- Patients who had intrathecal catheters, cesarean hysterectomies, and did not have documentation of date and time that urethral catheterization was discontinued were excluded from the final analysis.

Results

- Four hundred-one patients were eligible for propensity matching and 80 patients were matched in the low HB cohort and 80 patients were matched in the high HB cohort.
- One hundred fifty-four patients were included in the final analysis. Six were excluded for incomplete primary outcome data.
- Patients in the high HB cohort had a statistically significant longer duration of urinary catheterization compared to patients in the low HB cohort.
- Demographic and clinical data for the cohorts are presented in Table 1.
- No patient who was included in the final analysis required conversion to general anesthesia.

Table 1

	Received 10.5 mg or less hyperbaric bupivacaine 0.75% in intrathecal space (N=77)	Received 12 mg or more hyperbaric bupivacaine 0.75% in intrathecal space (N=77)	P-value
Weight (kg) (mean (SD))	105.0 ± 21.4	91.8 ± 21.1	<0.01*
Body mass index (kg/m²) (mean (SD))	39.2 ± 7.5	33.9 ± 7.0	<0.01*
Prior cesarean delivery (percentage)	43 (56%)	60 (78%)	<0.01*
Anesthetic technique			<0.01*
Single injection spinal	5 (6%)	19 (25%)	
Combined spinal epidural	72 (94%)	58 (75%)	
Dose of hyperbaric bupivacaine 0.75% (mg) (median (IQR))	10.5 (9.8-10.5)	12 (12-12.8)	<0.01*
Time from skin incision to wound closure (minutes) (mean (SD))	51 ± 14	47 ± 14	0.11
Quantitative blood loss (ml) (mean (SD))	584 ± 385	531 ± 356	0.38
Time from intrathecal administration of bupivacaine to urethral catheter removal (hours) (median (IQR))	6.4 (3.7-8.7)	7.8 (6.4-9.6)	0.02*
Cumulative urine output during urethral catheterization (ml)	500 (318-912)	600 (375-1120)	0.18
Reinsertion of urethral catheter (percentage)	4 (5%)	2 (3%)	0.68

Discussion

- Patients who had a higher dose of intrathecal HB had a statistically significant longer duration of urinary catheterization.
- The rate of CAUTI is low and it is likely that thousands or more patients would be necessary for a high intrathecal HB dose to be the primary contributor to a CAUTI.
- No patients in the study required conversion to general anesthesia and the rate of administration of systemic anesthetic adjuvant medication was identical between the cohorts.
- The Society for Obstetric Anesthesia and Perinatal released a consensus statement that summarized evidence for enhanced recovery after cesarean delivery that includes the recommendation that urinary catheters be removed between six and twelve hours postpartum following CD.²
- Future studies are needed to examine best practices for dosing intrathecal HB for CD.

References

1. Li F et al. Risk factors for catheter-associated urinary tract infection among hospitalized patients: A systematic review and meta-analysis of observational studies. J Adv Nurs. 2019 Mar;75(3):517-527
2. Bollag L et al. Society for Obstetric Anesthesia and Perinatology: Consensus Statement and Recommendations for Enhanced Recovery After Cesarean. Anesth Analg. 2021;132:1362-1377