Intrathecal dexmedetomidine and visceral sensations and pain during cesarean delivery: a prospective patient-reported outcome study

George Ghafari, Scott Kelly, Alexander “Sascha” Morris, Stephanie Wong, Jean Guglielminotti, Ruth Landau
Department of Anesthesiology, Columbia University Irving Medical Center

- The rate of patient-reported pain during cesarean delivery (PDCD) is 4.4-8.9% with spinal/CSE anesthesia.
- Neuraxial α_2-agonists are suggested to reduce PDCD.
- Visceral sensations (i.e pressure/tugging) have not been characterized in recent studies.
- We hypothesized that intrathecal dexmedetomidine (ITdex) is associated with less visceral sensations during CD, lower analgesic supplementation and increased patient satisfaction.

Background & Methods

- Prospective patient-reported survey study (May- Nov 2025)
- Consecutive scheduled or urgent cesarean delivery (CD) under spinal or combined spinal epidural (CSE) anesthesia
- Exclusion criteria: complex surgeries, fetal demise, use of general anesthesia, non-native English or Spanish speakers.
- 23-question survey assessing pain, pressure/tugging (categorized as none, mild, moderate, or severe) at different time points
- Secondary outcomes: IV analgesic supplementation (including conversion to general anesthesia), overall patient satisfaction.
- Statistical analysis: ITdex vs. No ITDex, used Fisher’s exact, chi-square, or Wilcoxon tests as appropriate, and adjusted odds ratios were calculated using propensity score adjustment.

SOAP 2026 ANNUAL MEETING
MONTRÉAL, QUÉBEC, CANADA APRIL 29-MAY 3, 2026

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Table 1: Patient demographics, comorbidities, obstetric data, and outcomes according to intrathecal dexmedetomidine use

	No IT Dexmedetomidine (n=562)	IT Dexmedetomidine (n=139)	P value
Age (year)	34 (IQR: 30, 38)	35 (IQR: 32, 39)	0.106
Body mass index (kg/m^2)	31.4 (IQR: 28.0, 35.4)	31.7 (IQR: 28.2, 37.1)	0.241
Gestational diabetes, (n=91)	67 (11.9%)	24 (17.4%)	0.091
Preexisting HTN (n=65)	52 (9.3%)	13 (9.4%)	> 0.99
Gestational HTN or preeclampsia (n=105)	83 (14.8%)	22 (15.9%)	0.692
Sickle cell disorder (n=21)	15 (2.7%)	6 (4.3%)	0.280
Repeat cesarean delivery (n=419)	316 (56.2%)	103 (74.1%)	**<0.001***
Placenta previa (n=21)	13 (2.3%)	8 (5.8%)	**0.046***
Category of cesarean delivery			0.740
Planned, scheduled (n=441)	350 (62.3%)	91 (65.5%)	
Intrapartum (n=83)	69 (12.3%)	14 (10.1%)	
Unplanned, not intrapartum (n=177)	143 (25.4%)	34 (24.5%)	
Emergent (‘stat’: could be intrapartum or not) (n=23)	18 (3.2%)	5 (3.6%)	0.790
Surgical duration (min)	60 (IQR: 49, 77)	75 (IQR: 59, 94)	**<0.001***
Tubal ligation (n=139)	102 (18.1%)	37 (26.6%)	**0.032***
Quantitative blood loss (ml)	664 (IQR: 459, 865)	808 (IQR: 633, 1048)	**<0.001***

- Standard spinal solution at our institution is hyperbaric bupivacaine 12 mg, fentanyl 15 μg, morphine 150 μg
- ITdex doses ranged from 2-5 μg with most receiving 4 μg (68.4%).
- IT clonidine doses ranged from 20-60 μg with most receiving 30 μg (87.3%).
- IV fentanyl, IV morphine, IV ketamine and IV dexmetomidine if IV dexmetomidine is indicated for pain treatment.

Table 2: Anesthetic data and supplemental medication according to intrathecal dexmedetomidine use

	No IT Dexmedetomidine (n=562)	IT Dexmedetomidine (n=139)	P value
Spinal (n=669)	535 (95.2%)	134 (96.4%)	
CSE (n=32)	27 (4.8%)	5 (3.6%)	
Intrathecal clonidine (spinal/CSE) (n=134)	134 (23.8%)	0 (0.0%)	**<0.001***
Intraoperative intravenous (analgesic, sedative, anxiolytic, shivering, itching) supplementation			
Fentanyl (n=73)	60 (10.7%)	13 (9.4%)	0.757
Morphine (n=7)	6 (1.1%)	1 (0.7%)	> 0.99
Dexmedetomidine (n=14) (given for pain)	10 (5.1%)	4 (8.3%)	0.485
Ketamine (n=9)	8 (1.4%)	1 (0.7%)	> 0.99
Midazolam (n=35)	30 (5.3%)	5 (3.6%)	0.516
Nalbuphine for itching (n=20)	12 (2.1%)	8 (5.8%)	**0.040***
Total intravenous analgesic (n=83)[d]	68 (12.1%)	15 (10.8%)	0.770
Conversion to general anesthesia for pain (n=3)	3 (0.5%)	0 (0.0%)	> 0.99

- Standard spinal solution at our institution is hyperbaric bupivacaine 12 mg, fentanyl 15 μg, morphine 150 μg
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Table 3: Patient-reported outcomes according to intrathecal dexmedetomidine use

	No IT Dexmedetomidine (n=562)	IT Dexmedetomidine (n=139)	P value	Adjusted Odds Ratio
'How strongly did you feel pressure/tugging during the cesarean delivery?'			0.323	
None or mild	358 (63.7%)	95 (68.3%)		1.00 (reference)
Moderate or severe	**204 (36.3%)**	**44 (31.7%)**		**0.62 (0.40, 0.97)***
'How strongly did you feel sharp pain during the cesarean delivery?'			0.537	
None or mild	548 (97.9%)	135 (97.1%)		1.00 (reference)
Moderate or severe	12 (2.1%)	4 (2.9%)		1.10 (0.29, 4.10)
'How satisfied are you with your anesthesia care?'			0.452	
Very Satisfied	502 (89.3%)	121 (87.1%)		1.00 (reference)
Satisfied, neutral, or unsatisfied	60 (10.7%)	18 (12.9%)		1.39 (0.72, 2.67)
'Was there anything that the anesthesia team could have done differently?'			0.078	
No	521 (92.9%)	135 (97.1%)		1.00 (reference)
Yes	40 (7.1%)	4 (2.9%)		0.52 (0.17, 1.59)
'If you have another cesarean delivery, would you want the same anesthesia team?'			0.816	
Yes	539 (95.9%)	133 (95.7%)		1.00 (reference)
No, not sure, or prefer not to answer	23 (4.1%)	6 (4.3%)		0.86 (0.31, 2.43)

In this large cohort of patients with scheduled, intrapartum and emergent cesarean deliveries:

- The incidence of pain was low (2.3%), with no measurable reduction with intrathecal dexmedetomidine
- Intrathecal dexmedetomidine (2-5 μg) had a statistically significant yet modest effect on moderate to severe visceral sensations, defined as moderate to severe pressure (Likert scale) or tugging at any time point during the cesarean delivery.
- However, since patients receiving intrathecal dexmedetomidine were presumed to be at risk for prolonged surgery (which was the case), it is possible that its beneficial effect is masked due to confounding by selection.

Clinical implications

- Intrathecal dexmedetomidine may attenuate sensations in clinical scenarios with anticipated prolonged duration and more pronounced visceral traction (e.g. tubal ligation).
- Further randomized clinical trials evaluating strategies to reduce sharp pain and visceral sensations are needed, though these might preclude inclusion of urgent/emergent complex cases and intrapartum cases.

Our team

Dr. Ruth Landau, MD

Dr. Jean Guglielminotti, MD, PhD

Alexander Morris, BS

Scott Kelly, BS

Stephanie Wong, BA

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