Intrathecal dexmedetomidine for cesarean delivery: a scoping review

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- Pain during cesarean delivery (PDCD) and acute post-cesarean pain remain key issues
- Strategies to prevent PDCD, reduce hyperalgesia and acute pain, and promote opioid-reduction include neuraxial α_2-adrenergic agonists.
- Intrathecal dexmedetomidine (IT DEX) use is uncommon for cesarean delivery in North America (not FDA approved, and no safety studies), though neuraxial DEX is mentioned in the 2024 ASA statement on the management of PDCD.

We decided to conduct a scoping review to identify and characterize studies reporting on the use of IT DEX for cesarean delivery and evaluate the quality of the evidence.

- Following PRISMA-Scr guidelines, PubMed and Embase were searched in October 2024 for all articles reporting on IT DEX for cesarean delivery (excluding reviews and systematic reviews and meta-analysis)
- Studies were excluded if DEX was given by another route (IV, epidural, nasal)
- We developed a data chart with 7 questions related to study design and 13 questions related to clinical outcomes
- Outcomes were extracted, and frequencies tabulated.

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Background & methods

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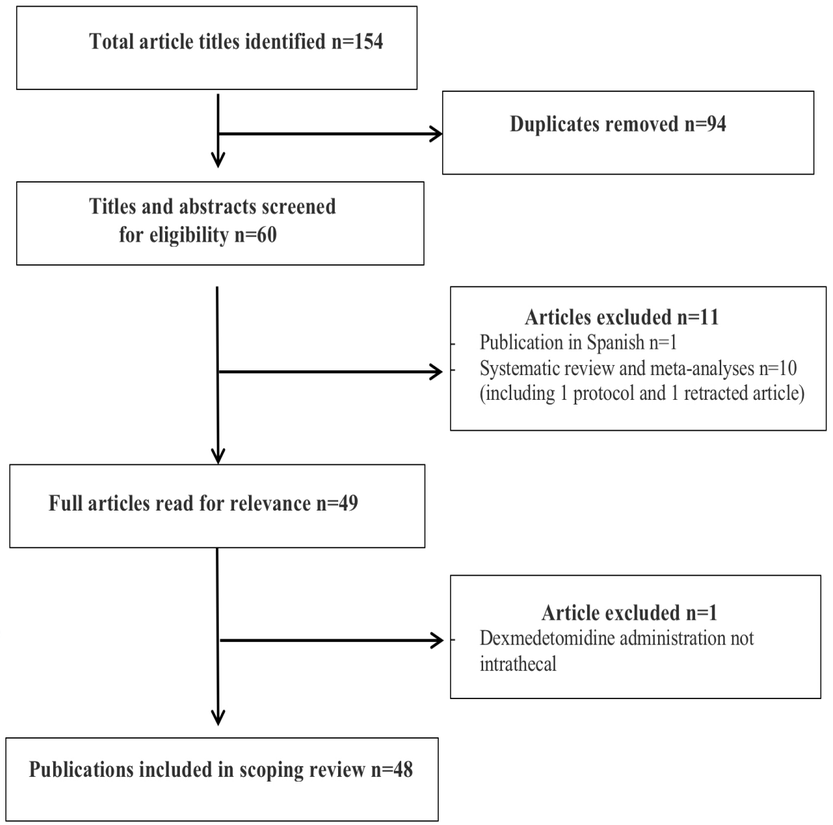
- 48 publications in English between 2015 and October 2024

- North America (n=3), Europe (n=2), 42 from Asia (India (n=15), China (n=12), Pakistan (n=8), Iran (n=6)), and two from Africa (Egypt (n=2)
- 43 RCTs, 3 observational trials, 2 case reports or series
- 4,124 cesarean delivery cases - 1,981 patients receiving IT DEX
- Seven dose-response studies = doses ranged between 1-35 µg

- Most studies evaluated IT DEX at a dose of 5 µg (n=32)

- Most RCTs were placebo-controlled, comparing local anesthetic alone vs. local anesthetic plus IT DEX (n=23).
- Only one study evaluated IT DEX with fentanyl co-administration.
- No study evaluated IT DEX with IT morphine co-administration.
- One study compared IT Dex vs. IT fentanyl and morphine.
- Two studies compared IT Dex vs. IT morphine.

- Three RCTs comparing IT DEX vs. IT clonidine



	IT DEX	IT Clonidine
Li 2015 (n=84)	10 µg	75 µg
Rajasekaran 2020 (n=90)	5 µg	15 µg
Ahmed 2022 (n=120)	25 µg	25 µg

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Results

Sensory-motor block onset (n=32 studies)

- 17 studies reported faster onset.

Sensory-motor block duration (n=32 studies)

- 29 studies reported prolonged duration of block compared to placebo and adjuvants (but not clonidine).

Shivering (n=35 studies)

- 21 studies reported no difference, 13 studies showed reduced shivering.

Intraoperative pain (n=0 studies)

Intraoperative blood pressure (n=37 studies)

- 30 studies with no difference in blood pressure values
- 6 studies with increased incidence of hypotension and/or vasopressor use,
- 1 study with significant increase in phenylephrine use with 7.5 µg and 10 µg compared with 0 or 5 µg

Postoperative pain and analgesic use (n=34 studies)

- Reported outcomes were heterogeneous (VAS scores, time to 1st analgesic request, total opioid use).
- 24 studies reported decreased postoperative pain

Neonatal outcomes (n=29 studies)

- No difference in Apgar scores or resuscitation.
- In one study (n= 100 cases with IT DEX 7.5 µg), DEX was undetectable in cord blood samples.

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Clinical outcomes

- The quality of study design, analysis, and reporting was poor.
- 23 of 48 studies (48%) without a primary outcome

- No study reported on IT DEX co-administered with both a lipophilic opioid (e.g. fentanyl) and a long-acting opioid (e.g. morphine) as recommended in current practice guidelines to ensure adequate anesthesia for cesarean delivery.

- Compared with intrathecal clonidine, IT DEX achieved similar onset and similar sensory-motor block in all 3 studies comparing their effects, however, the doses were not equipotent.

- One cannot draw conclusions on the value of adding IT Dex to a spinal anesthetic when a multimodal approach including neuraxial opioids and post-cesarean opioid-sparing medication is prescribed.

5 µg IT DEX = 50 µg IT CLO

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Discussion

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