The Effectiveness of Dexmedetomidine as an Adjunct in Spinal Anesthesia for Pain Relief in Cesarean Patients: A Scoping Review

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Purpose
• The purpose is to determine the effect of the addition of dexmedetomidine as an adjunct to intrathecal blocks in post-cesarean patients in comparison to the post-cesarean patients who received only traditional intrathecal blocks during the 24-hour postoperative period.

Aims
• Identify current, traditional practices for intrathecal blocks
• Compare the amount of pain control, motor blockade, and sensory blockade in traditional blocks to the amount provided by intrathecal blocks with dexmedetomidine.

Background

Cesarean Sections and Anesthesia
• Account for 25% of all births in the United States
• Spinal anesthesia is preferred to general anesthesia
  ◦ Allows the mother to be awake for childbirth
  ◦ Avoids:
    • Tracheal intubation
    • Aspiration
    • Higher medical expenses
    • Lung infection
• High doses of local anesthetic are required for adequate pain control
  ◦ Increases the risk of a variety of maternal and neonatal adverse events
  ◦ Hypotension
  ◦ Nausea and vomiting
• Various adjuncts have been added to spinal anesthetics to attempt to improve the anesthesia
  ◦ Clonidine, fentanyl, morphine, and sufentanil
  ◦ Have a variety of adverse effects
    • Itching
    • Respiratory depression
    • Nausea and vomiting
    • Urinary retention
• Dexmedetomidine has been proposed as a promising adjunct to spinal anesthesia
  ◦ Highly selective alpha-2 adrenergic receptor agonist
  ◦ Decreased likelihood of respiratory depression
  ◦ Does not significantly cross the placenta

Methods

1. Search for articles

<table>
<thead>
<tr>
<th>Article Eligibility Criteria</th>
<th>Article Content Inclusion Criteria</th>
<th>Sources of Articles</th>
<th>Search Words/Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer-reviewed scientific journal articles</td>
<td>Full-term pregnancy</td>
<td>UTHSC online library database</td>
<td>Cesarean section</td>
</tr>
<tr>
<td>IRB approval</td>
<td>Cesarean section with spinal block</td>
<td>CINAHL</td>
<td>Pregnancy</td>
</tr>
<tr>
<td>English</td>
<td>Patients are &gt; 17 years old</td>
<td>Cochrane</td>
<td>Dexmedetomidine</td>
</tr>
<tr>
<td>Full-text</td>
<td>No comorbidities that could affect the results</td>
<td>PubMed</td>
<td>Spinal anesthesia</td>
</tr>
</tbody>
</table>

2. Collection of articles

5 articles obtained by each group member

3. Collection of data into a Synthesis Table

<table>
<thead>
<tr>
<th>Sensory block onset</th>
<th>Motor block onset</th>
<th>Sensory block duration</th>
<th>Motor block duration</th>
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</thead>
<tbody>
<tr>
<td>Intraoperative maternal analgesia</td>
<td>Maternal hemodynamic</td>
<td>Intra/post-operative adverse events</td>
<td>Postoperative analgesia scores</td>
</tr>
<tr>
<td>Postoperative analgesia duration</td>
<td>Postoperative recovery scores</td>
<td>Postoperative shivering</td>
<td>Neonatal outcomes</td>
</tr>
<tr>
<td>Umbilical artery and vein blood analysis</td>
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</tbody>
</table>

Outcomes Synthesis Table

<table>
<thead>
<tr>
<th>Outcomes of Interest</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster motor block</td>
<td>Yes</td>
</tr>
<tr>
<td>Faster sensory block onset times</td>
<td>Yes</td>
</tr>
<tr>
<td>Prolonged duration of sensory block</td>
<td>Yes</td>
</tr>
<tr>
<td>Prolonged or no change to the duration of motor blockade</td>
<td>No</td>
</tr>
<tr>
<td>Improved postoperative recovery scores</td>
<td>Yes</td>
</tr>
<tr>
<td>Reduced postoperative shivering</td>
<td>Yes</td>
</tr>
<tr>
<td>No change in neonatal outcomes, maternal hemodynamics, and intraoperative adverse events</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Results

Primary Outcomes
• Faster motor block
• Faster sensory block onset times
• Prolonged duration of sensory block
• Prolonged or no change to the duration of motor blockade

Other Outcomes
• Improved postoperative recovery scores
• Reduced postoperative shivering
• No change in neonatal outcomes, maternal hemodynamics, and intraoperative adverse events

Implications for Practice

Next Steps:
• Further research into the comparison of dexmedetomidine to other adjuncts, such as
  ◦ Fentanyl
  ◦ Hydromorphone
• Further research into the use of dexmedetomidine as an adjunct to spinal anesthesia in atypical parturients
  ◦ Non-full-term parturients
  ◦ Parturients with comorbidities
• Further research into the appropriate dosing of spinal dexmedetomidine

References
Scan the QR code to view references.