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Enhanced Recovery After Surgery (ERAS) Vs Traditional Care In Pediatric Cerebral Palsy Patients Undergoing Bilateral Multilevel Lower Extremity Orthopedic Surgery: A Pilot Study

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Enhanced Recovery After Surgery vs Traditional Care in Pediatric Cerebral Palsy Patients Undergoing Bilateral Multilevel Lower Extremity Orthopedic Surgery: A Pilot Study

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Introduction

- Children with cerebral palsy (CP) often undergo musculoskeletal surgeries throughout their developmental years.
- Narcotics are not ideal in this patient population due to underlying pulmonary pathology and constipation.
- Standard of treatment for these patients utilizes an epidural catheter for 1-2 days post-operatively.
- Epidural catheter placement in this patient population may not always be possible or safe. They also decrease mobility and prevent the initiation of physical therapy.
- We developed an enhanced recovery after surgery (ERAS) protocol utilizing peripheral nerve blocks instead of epidural catheters as well as instituting a standardized care protocol throughout their care in the hospital system.

Methods

- IRB approved secondary data use cohort pilot study
- 10 consecutive CP patients undergoing bilateral multilevel lower extremity surgeries utilizing ERAS protocol from June to Sept 2021 were compared with controls who underwent traditional care from 2017 to 2020
- Patients were matched by Gross Motor Function Classification System (GMFCS) score, procedure performed and age.
- Data collected included surgery performed, type of regional/neuraxial anesthesia performed, need for patient controlled analgesia (PCA), narcotic use, diazepam use, pain scores, post operative day cleared by PT, and length of stay.
- Since completion of the pilot study we have taken care of roughly another 45 patients using this ERAS protocol.

Results

<table>
<thead>
<tr>
<th>Table 2</th>
<th>ERAS (n=10)</th>
<th>Traditional (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMFCS</td>
<td>4.20</td>
<td>4.20</td>
</tr>
<tr>
<td>Narcotic Introp ME / kg</td>
<td>0.16</td>
<td>0.18</td>
</tr>
<tr>
<td>Narcotic Post-op ME / kg</td>
<td>0.26</td>
<td>0.54</td>
</tr>
<tr>
<td>Narcotic Post-op ME / kg / day</td>
<td>0.12</td>
<td>0.19</td>
</tr>
<tr>
<td>Dizepam Post-op / kg</td>
<td>0.64</td>
<td>0.60</td>
</tr>
<tr>
<td>Dizepam Post-op / kg/day</td>
<td>0.29</td>
<td>0.20</td>
</tr>
<tr>
<td>Post-op PCA Needed</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Discharged from PT (days)</td>
<td>1.70</td>
<td>2.44</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>2.20</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Comparison of Average Pain Scores

Conclusion

- The results of this pilot study were very encouraging. This is a very small pilot study so a larger study will need to be performed to verify these results.
- Replacing an indwelling epidural catheter with single shot peripheral nerve blocks at the beginning of the surgery allowed for earlier mobilization, discharge from physical therapy and removal of Foley catheter.
- The “Ideal peripheral block” is not clear when a pelvic osteotomy or acetabuloplasty is performed.
- For the 10 study patients a supra inguinal fascia ilioaca block was performed when an acetabuloplasty was planned.
- Larger study comparing these three blocks (supra inguinal fascia ilioaca, erector spine plane quadratus lumborum) will need to be performed to determine if one block is superior to the others when pelvic osteotomies are planned.

Discussion

- The secondary outcomes are narcotic consumption and incidence of side effects.

Discussion

- The incidence of side effects was decreased in the ERAS group.
- In the ERAS group 1/10 patients received ketorolac infusion and none of the patients needed diazepam during the post-operative period.
- No side effects were seen during the pilot study related to the acetabuloplasty.
- Since completion of the pilot study, one patient was too somnolent in PACU so the dexmedetomidine infusion was not started, and one patient had it stopped on the floor for somnolence.
- Further research into the safety and efficacy of dexmedetomidine infusions post operatively should be undertaken.

References