Association of Neuraxial Anesthesia with Postoperative Opioid Use in Pediatric Burn Patients

Joy Chen, BS1, Tan Nguyen, BS1, John Liu, MD2

1University of California Davis School of Medicine, 2Shriners Hospitals for Children

INTRODUCTION

Split thickness skin grafts (STSG) are required for severe burns and pain is the most common cause of distress within the first year of the injury.1 Postoperative pain is challenging due to the painful surgical procedure performed and the dressing changes required. Poor pain control is concerning, as it has been associated with PTSD, anxiety, depression, and long-term alterations in pain processing.2,3 Currently, opioids are widely used to manage postoperative pain. While adequate pain control is essential, high dose and/or prolonged use of opioids can also cause adverse effects to delay recovery, including sedation and tolerance.4,5,6,7 Neuraxial anesthesia administered intraoperatively is one approach to decrease postoperative pain and opioid use.

OBJECTIVES

In this study, we seek to assess if neuraxial anesthesia given intraoperatively is associated with decreased opioid requirement after surgery compared to general anesthesia alone.

METHODS

• A review of patients who underwent STSG and neuraxial anesthesia at Shriners Hospitals for Children between 1/1/2017 to 6/1/2018 was examined. Patients with spinal anesthesia at Shriners Hospitals for Children between 1/1/2017 to 6/1/2018 was examined. Patients with spinal anesthesia were included in the study.

RESULTS

Table 1. Comparison between the neuraxial anesthesia group and the historical control

<table>
<thead>
<tr>
<th></th>
<th>Historical Control (N=30)</th>
<th>Neuraxial Anesthesia (N=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, months</td>
<td>32 ± 29.6 (2.2-96)</td>
<td>61.2 ± 35.7 (12-120)</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>13.7 ± 6.4 (3.6-35)</td>
<td>21.0 ± 8.9 (10.3-41.1)</td>
</tr>
<tr>
<td>Surgical time, min</td>
<td>42.1 ± 30.4 (12-94)</td>
<td>66.0 ± 39.7 (12-242)</td>
</tr>
<tr>
<td>MME, mg·kg⁻¹·24 hour⁻¹</td>
<td>36.9 ± 10.8 (10.5-126)</td>
<td>0.6 ± 0.5 (0-1.9)</td>
</tr>
<tr>
<td>Ketamine, mg·kg⁻¹·24 hour⁻¹</td>
<td>86.4 ± 12.7 (34.6-184.3)</td>
<td>0.5 ± 1.2 (0-4.4)</td>
</tr>
</tbody>
</table>

• Of the 42 patients included in the study, pain scores and opioid use were the highest within the first 24 hours after surgery.

• In the first 24 hours, the average opioid administration in the intervention group was 0.6 ± 0.5 MME/kg in the intervention group and 36.9 ± 10.8 MME/kg in the historical control.

• In the first 24 hours, the average amount of ketamine given was 0.5 ± 1.2 mg/kg in the intervention group and 86.4 ± 12.7 mg/kg in the historical control.

CONCLUSION & FUTURE DIRECTIONS

• The results show that neuraxial anesthesia given intraoperatively is associated with lower opioid use compared with general anesthesia and IV opioids.

• Pediatric patients with burn injuries undergoing STSG may benefit from neuraxial anesthesia in order to adequately control pain without the need for high dose opioids.

In the future, this observation that neuraxial anesthesia results in lower opioid requirements should be formally tested in a prospective trial

Figure 1. Trends in (A) average pain scores and (B) morphine milligram equivalents (MME) per kg at time intervals after surgery among patients who received neuraxial anesthesia (n=42). The red diamond represents the mean. PACU indicates the post-anesthesia care unit, which is 1 hour after surgery

ACKNOWLEDGEMENT

Funding was provided by the UC Davis Medical Student Research Fellowship. Special thanks to Dr. John Liu for his contribution and guidance with this project.

REFERENCES


9. Joy Chen, BS, John Liu, MD

CONCLUSION & FUTURE DIRECTIONS

The results show that neuraxial anesthesia given intraoperatively is associated with lower opioid use compared with general anesthesia and IV opioids.

Pediatric patients with burn injuries undergoing STSG may benefit from neuraxial anesthesia in order to adequately control pain without the need for high dose opioids.

In the future, this observation that neuraxial anesthesia results in lower opioid requirements should be formally tested in a prospective trial.

Access abstract information here: