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

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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 were included in the study.
- A paper published by Bussolin et al (2003) served as the historical control for this study.[8]
- Patients who were >10 years old were excluded from the data analysis to match the historical control.
- Amount of opioids were converted to oral morphine milligram equivalents (MME) and adjusted for body weight (kg).

RESULTS

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

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

- 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.

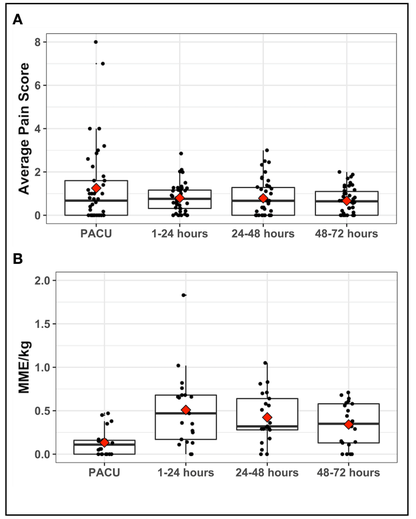

Figure 1. Trends in (A) average pain scores and (B) morphine milligram equivalents (MME) per kg at time intervals after surgery among patients who received neuraxial anesthesia (n=42). The red diamond represents the mean.

PACU indicates the post-anesthesia care unit, which is 1 hour after surgery

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:

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