

Retrospective chart review of intrathecal morphine administration for preemptive analgesia in children undergoing posterior spinal fusion for treatment of idiopathic scoliosis

Authors: P Tripi, MD , J Potzman, MD, C Poe-Kochert, CNP, S Thomas, G Thompson, MD
Affiliation: University Hospitals Case Medical Center, Cleveland, Ohio

Introduction: Children undergoing posterior spinal fusion for idiopathic scoliosis may experience severe postoperative pain. Although several published reports have examined the effectiveness of intra-operative intrathecal morphine administration for post-operative analgesia (1-3), no study has established an optimal dosage for children. We have routinely administered intrathecal morphine in a variety of dosages to over 240 patients with idiopathic scoliosis undergoing spinal fusion performed by the same surgeon. The goal of this study was to identify an optimal dose of intrathecal morphine for administration in these patients.

Methods: Following IRB approval, we reviewed data regarding children with idiopathic scoliosis who underwent posterior spinal fusion at our institution. An IRB approved pediatric spinal surgery database was our primary source of information. Following induction of general anesthesia and prior to surgical incision, most patients received intrathecal morphine administered by an anesthesiologist. Anesthesia was maintained with 50% nitrous oxide and up to 0.6 % isoflurane, with minimal or no systemic opioids given to patients receiving neuraxial anesthesia. Other interventions included controlled hypotension and infusion of aminocaproic acid to minimize blood loss, and somatosensory evoked potentials with or without motor evoked potentials to monitor spinal cord function.

The patients were divided into 3 groups based upon intrathecal morphine dose: no dose, moderate dose, or high dose. Patient age, gender, duration and description of the surgical procedure, blood loss and transfusion requirements, dosage of intrathecal morphine, anesthetic agents and adjuncts, postoperative pain scores and analgesic requirements, postoperative respiratory depression, need for PICU admission, and length of stay were analyzed.

Results: A total of 244 patients were studied, with results summarized in Table 1.

Variable	No Dose	Moderate Dose	High Dose
Patients Studied (n)	27	200	17
Intrathecal Morphine Dose (ug/kg)			
Mean	0	14	24
Range	0	9 to 18	20-32
Mean VAS Pain Score in PACU (scale 0-10)	4.5	0.5	0
Mean Time to First Opioid Rescue (hrs)	6.1	16.2	21.6
Respiratory Depression (n)	0	8(4%)	3(18%)
PICU Admission (n)	0	7(4%)	3(18%)
Nausea/Vomiting (n)	9(33%)	40(20%)	9(53%)
Pruritis (n)	1(4%)	8(4%)	0

Discussion: Intrathecal morphine in a dose of approximately 15 ug/kg provides effective and safe post-operative pain relief in children undergoing posterior spinal fusion for idiopathic scoliosis. Higher doses produce similar analgesia, but with greater frequency of respiratory depression and nausea/vomiting.

References:

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2. Gall O: *Anesthesiology* 2001; 94(3): 447-52.
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