

Adjunctive Intrathecal Morphine Analgesia for Postoperative Pain in Adult Spinal Surgery

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Introduction: Adjunctive intrathecal morphine (ITM) has been suggested for spinal surgery due to potential to provide adequate analgesia at low dosages and ease of access to the thecal sac¹⁻². However, early studies have been limited by small sample sizes or conflicting results³⁻⁴. Also, ITM has been associated with adverse events such as pruritus and respiratory depression, deterring widespread use². As a result, the goal of this study was to determine the effectiveness of ITM for reducing postoperative pain.

Methods: A search of PubMed, Web of Science, Clinicaltrials.gov, and Cochrane Central Register of Controlled Trials was conducted for randomized controlled trials. The results were screened independently by two reviewers based on pre-determined inclusion-exclusion criteria. Postoperative opioid consumption, pain scores, length of stay and adverse events were documented. Standard mean differences (SMD) were applied to continuous outcomes and Odds Ratios (OR) to dichotomous ones.

Results: A total of 8 randomized controlled trials with 393 subjects were included in the quantitative analysis. Compared to control, patients that received adjunctive ITM had significantly reduced morphine equivalent consumption and less pain in the 24 hours following surgery ($p < 0.001$). Although there was no significant difference between the ITM and control groups in terms of occurrence of nausea, vomiting, sedation, or respiratory depression, the ITM group did experience more pruritus ($p < 0.0001$). Although the ITM group had a shorter stay at the facility, this difference was not considered statistically significant.

Conclusions: Adjunctive intrathecal morphine provides a significant opioid sparing effect and reduction of pain in first 24 hours following spinal surgery despite an increase in incidence of pruritus.

References:

1. France JC, Jorgenson SS, Lowe TG, Dwyer AP. The use of intrathecal morphine for analgesia after posterolateral lumbar fusion. *Spine* 1997;22(19):2272-7.
3. Barron DW, Strong JE. Postoperative analgesia in major orthopaedic surgery: epidural and intrathecal opiates. *Anaesthesia* 1981;36(10):937-41.
4. Johnson RG, Miller M, Murphy M. Intraspinial narcotic analgesia: a comparison of two methods of postoperative pain relief. *Spine* 1989;14(4):363-6.

Table 1. Postoperative opioid consumption, pain scores, length of stay

Outcomes (# trials included)	# intrathecal morphine patients/ # control	Analysis Method	SMD (95% CI)	p-value
Opioid consumption (5)	150/100	Random effects	-1.07 (-1.71 to -0.42)	0.001
Pain scores (3)	85/57	Fixed effects	-0.55 (-0.90 to -0.20)	0.002
Length of stay (3)	107/63	Random effects	-0.69 (-1.58 to 0.20)	0.13

Table 2. Postoperative complications

Outcomes (# trials included)	Intrathecal morphine events (total patients)	Control events (total patients)	Analysis Method	OR (95% CI)	p-value
Respiratory depression (8)	6 (231)	0 (162)	Fixed effects	3.48 0.41 to 29.32)	0.25
Nausea (4)	36 (105)	35 (77)	Fixed effects	0.86 (0.44 to 1.68)	0.67
Vomiting (4)	21 (105)	16 (86)	Fixed effects	1.22 (0.55 to 2.70)	0.62
Pruritus (6)	44 (189)	9 (126)	Fixed effects	4.09 (1.84 to 16.35)	<0.001
Sedation (4)	17 (124)	19 (77)	Fixed effects	0.54 (0.22 to 1.32)	0.18