TITLE: Intrathecal Bupivacaine via Infusion Pump for the Management of Pain: Clinical Evidence, Safety, and Guidelines

DATE: 21 November 2012

RESEARCH QUESTIONS

1. What is the clinical-effectiveness of bupivacaine when administered as an intrathecal infusion via an infusion pump for patients requiring enhanced pain control?

2. What is the clinical evidence regarding the safety of bupivacaine when administered as an intrathecal infusion via an infusion pump for patients requiring enhanced pain control?

3. What is the clinical evidence regarding the stability of bupivacaine when administered intrathecally via an infusion pump?

4. What are the evidence-based guidelines regarding the use of intrathecal bupivacaine administration via infusion pump in patients requiring pain management?

KEY MESSAGE

One systematic review, one randomized controlled trial, and three non-randomized studies were identified regarding bupivacaine administered as an intrathecal infusion via an infusion pump. No relevant evidence-based guidelines were identified.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2012, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and November 9, 2012. Internet links were provided, where available.
The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One systematic review, one randomized controlled trial, and three non-randomized studies were identified regarding bupivacaine administered as an intrathecal infusion via an infusion pump. No relevant health technology assessments or evidence-based guidelines were identified. Additional references of potential interest are provided in the appendix. This report is an update to a previous Rapid Response completed in June 2009. (http://www.cadth.ca/media/pdf/htis-L1/J0288%20Bupivacaine%20for%20Pain%20Reduction%20final.pdf)

OVERALL SUMMARY OF FINDINGS

Clinical effectiveness
One systematic review examined the use of intrathecal (IT) infusion systems for the management of chronic non-cancer pain and found there was limited evidence to support their use. Although studies including bupivacaine were analyzed as part of the review, but no specific conclusions or recommendations were made.

Two of the included studies examined the use of bupivacaine in combination with opioids. The included randomized controlled trial compared hydromorphone and bupivacaine administered through an epidural patient-controlled pump with hydromorphone alone administered through patient-controlled intravenous analgesia for pediatric patients undergoing spinal fusion. The epidural route provided slightly improved analgesia compared with intravenous. The non-randomized study examined the effect of bupivacaine administered in combination with opioids or opioids alone, via an IT delivery system for the management of chronic non-cancer pain. There was a significant reduction in pain intensity observed in both groups and patients in the combination group had a significantly lower rate of dose escalation of IT opioids.

One non-randomized study included patients receiving a continuous infusion of bupivacaine after spinal fusion surgery. Bupivacaine infusion was associated with significantly less narcotics within the first four days after surgery, lower pain scores, and improvement in many other post-surgical outcomes when compared with retrospective controls.

Safety and adverse events
Though few adverse events were reported in the study abstracts, the hydromorphone plus bupivacaine group experienced a lower incidence of moderate to severe muscle spasms compared to hydromorphone alone and no adverse effects were attributed to the intrathecal pump in a non-randomized study.
Stability
The included non-randomized study\(^5\) that examined the stability and tolerability of high concentrations of bupivacaine plus opioid solutions in IT infusions, resulted in the conclusion that bupivacaine was stable at high concentrations when mixed with opioids for IT administration.

REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials


Non-Randomized Studies


Guidelines and Recommendations
No literature identified.

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APPENDIX – FURTHER INFORMATION:

Guidelines – consensus-based or methodology not specified


Additional References

