

Is ropivacaine hydrochloride effective as an intercostal block for pain management in adult cardiac surgery patients compared to bupivacaine hydrochloride?

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SUMMARY STATEMENT:

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REQUEST:

Is ropivacaine hydrochloride effective as an intercostal block for pain management in adult cardiac surgery patients compared to bupivacaine hydrochloride?

REQUESTED BY:

Althea Barr, CNC, Cardiac Surgery, Monash Medical Centre, Clayton

METHODOLOGY

Search Strategy

The Centre for Clinical Effectiveness defines the 'best available evidence' as that research we can identify that is least susceptible to bias. We determine this according to pre-defined National Health and Medical Research Council (NHMRC, 2000) criteria (see Appendix 1).

First, we search for systematic reviews, evidence based clinical practice guidelines, health technology assessments and randomised controlled trials. If we identify sound, relevant material of this type, the search stops. Otherwise, our search strategy broadens to include studies that are more prone to bias, less generalisable or have other methodological difficulties. We include case-control and longitudinal cohort studies in our critical appraisal reports. While we cite observational and case series studies, and narrative reviews and consensus statements, in our reports we do not critically appraise them. Such studies can produce accurate results but they are generally too prone to bias to allow determination of their validity beyond their immediate setting.

Details of Evidence Request

Patient: Cardiac surgery patients
Intervention: Ropivacaine as intercostal block
Comparison: Bupivacaine
Outcomes: Postoperative pain, adverse events, side effects

Search terms:

The following search terms were used to scour electronic databases and websites:

Table 1. Search terms used in the retrieval of articles from electronic databases and websites

Field of focus	Search term
Patient-related	Cardiac surgery patient\$, cardiac patient\$
Intervention-related	Ropivacaine, naropin, amides, ropivacaine hydrochloride
Comparison-related	Bupivacaine, bupivacaine hydrochloride
Outcome-related	Side effects, adverse events, postoperative pain
Other-term	Intercostal block

Resources Searched

We searched the following databases and Internet websites:

Cochrane Library CD-ROM- Issue 1, 2001

Medline (OVID)- 1966 to May week 2 2001

Best Evidence (OVID)- 1991 to January/February 2001

CINAHL (OVID) – 1982 to April 2001

PreMedline (OVID)- May 16, 2001

National Guideline clearinghouse- May 16, 2001

Aggressive Research Intelligence Facility (ARIF) – April 11, 2001

NHS Centre for Reviews and Dissemination – May 9, 2001

Bandolier – May 15, 2001

Refinements, Searching & Reporting Constraints:

We included items of evidence that were available to us on 17 May 2001. The search was restricted to humans aged over 19 years and articles published in English in the last 10 years.

RESULTS:

From our sources we identified 4 articles related to the request that were categorised as follows:

Table 2. Study designs of articles retrieved by search

Study Design	Number
Systematic reviews or meta-analyses	0
Evidence-based clinical practice guidelines	0
Randomised controlled trials	0
Controlled trials, cohort or case-control analytic studies	0
Case series, consensus reports, Narrative reviews	3
Unknown	1

Articles were excluded from further appraisal as follows:

Table 1: Reasons for exclusion of articles retrieved by search

Reason for exclusion	Number
Narrative reviews	2
Case report	1
Unable to determine study design	1

This left us with no articles for appraisal. We are reasonably confident these articles represent the most relevant findings published to date based on our refinements, searching and reporting constraints.

REFERENCES

ARTICLE CRITICALLY APPRAISED

None

ARTICLES NOT CRITICALLY APPRAISED

Level IV evidence- Narrative reviews:

1. Mather, L.E. and D. H. Chang (2001). "Cardiotoxicity with modern local anaesthetics: is there a safer choice?" Drugs 61(3): 333-42.
2. Owen, M. D. and L. S. Dean (2000). "Ropivacaine." Expert Opinion on Pharmacotherapy 1(2): 325-36.

Level IV evidence-Case report:

1. Ruetsch, Y. A., K. E. Fattinger, et al. (1999). "Ropivacaine-induced convulsions and severe cardiac dysrhythmia after sciatic block." Anesthesiology 90(6): 1784-1786.

Unable to determine study design/level of evidence

1. Bertini, L. and P. D. Benedetto (2000). "Equipotency of ropivacaine and bupivacaine in peripheral nerve block." Regional Anesthesia & Pain Medicine 25(6):659-60

APPENDIX 1

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Levels of Evidence

Based on "How to use the evidence: assessment and application of scientific evidence" (National Health & Medical Research Council, Canberra, 2000):

Level I	Evidence obtained from a systematic review of all relevant randomised controlled trials.
Level II	Evidence obtained from at least one properly designed randomised controlled trial.
Level III-1	Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method).
Level III-2	Evidence obtained from comparative studies (including systematic reviews of such studies) with concurrent controls and allocation not randomized, cohort studies, case control studies, or interrupted time series with a control group.
Level III-3	Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group.
Level IV	Evidence obtained from case series, either post-test or pre-test/post-test.