TITLE: Antibiotic-Infused Bone Cement for Orthopedic Surgeries: Clinical and Cost-Effectiveness

DATE: 01 March 2010

RESEARCH QUESTIONS:

1. What is the clinical effectiveness of antibiotic infused bone cement for orthopedic surgeries?

2. What is the cost-effectiveness of antibiotic-infused bone cement for orthopedic surgeries?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including PubMed, Embase, the Cochrane Library (Issue 2, 2010), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international health technology agencies, and a focused Internet search. The search is limited to human, English language articles published between 2008 and February 2010, with the exception of economic studies which were limited to cost studies published between 2005 and February 2010. Filters were applied to limit the retrieval of articles published from 2005 to 2007 to economic studies, however no study design filters were used in the 2008 to Feb 2010 search. Internet links were provided, where available. This search is an update to a previous HTIS report entitled: Antibiotic Infused Bone Cement for Orthopedic Surgeries: A Review of the Clinical Benefit and Harm.

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:

The literature search identified one controlled clinical trial and two observational studies on the clinical effectiveness, and one economic evaluation on the cost-effectiveness of antibiotic-infused cement for orthopedic surgeries. No health technology assessments, systematic reviews, meta-analyses, or randomized controlled trials were identified. Uncontrolled observational studies and additional articles of potential interest are included in the appendix.

HTIS 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, controlled clinical trials, observational studies, and economic evaluations.

OVERALL SUMMARY OF FINDINGS:

The three included clinical studies were specific to knee arthroplasties. Chiu et al.\(^1\) conducted a controlled clinical trial of 183 patients undergoing first-time revision knee arthroplasty, comparing vancomycin-impregnated bone cement to cement without antibiotics. The incidence of postoperative deep infection was significantly less in the antibiotic-infused cement group than in the group who received cement without antibiotics. Ghandi et al.\(^2\) surveyed 1,625 patients postoperatively following primary knee arthroplasty and found that the incidence of deep infections at one year was similar in patients who received antibiotic-infused cement compared with those who received plain bone cement. Namba et al.\(^3\) extracted data from a community-based joint registry that included 22,889 primary total knee arthroplasty patients. They found that the rate of deep infection was higher with antibiotic-infused bone cement compared with regular cement, both in the entire cohort of patients and among the subset of patients with diabetes, who were considered to be at higher risk for infection.

The included economic evaluation (Cummins et al.)\(^4\) focused on primary total hip arthroplasty. The authors determined that the use of antibiotic-infused bone cement resulted in an overall cost decrease when the primary outcome of interest was revision due to either infection or aseptic loosening. When revision due to infection was considered the primary outcome, the cost of cement and age of the patient influenced cost-effectiveness. For patients \(\geq 70\) years of age, or if the cost of antibiotic-infused cement exceeded $650, the cost per quality adjusted life year was higher than $50,000.
REFERENCES SUMMARIZED:

Health technology assessments
No literature identified

Systematic reviews and meta-analyses
No literature identified

Randomized controlled trials
No literature identified

Controlled clinical trials


Observational studies


Economic evaluations


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APPENDIX – FURTHER INFORMATION:

Uncontrolled Observational Studies


Review articles


Additional references