



Antibiotic-impregnated Shunts vs Standard Shunts: A Meta and Cost Analysis

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Introduction

In 2002, an antibiotic-impregnated shunt (AIS) system became available to the market containing rifampin and clindamycin. There have been numerous studies evaluating its effectiveness at reducing the risk of shunt infection, some of which showed a protective benefit while others have not. This study was undertaken to critically evaluate the literature using a metaanalysis and to perform a cost analysis as well.

Methods

A search strategy using PubMed and Medline databases as well as manual inspection of journals and bibliographies was undertaken to identify articles that met our inclusion and exclusion criteria. Articles must have contained groups of patients that were treated with AIS and SS, and the number of infections per procedure within each group. Papers were excluded if they contained previously published data, or a different bacteriocidal/bacteriostatic shunt system.

Results

The initial search identified 18 studies, but 5 were excluded. Ten studies were from single institutions, 3 were multiinstitution. All papers except one were class III data (one class II). Six papers demonstrated a decreased in the shunt infection rate with AIS, six did not and one was indeterminate. In 5332 SS (control) patients, the shunt infection rate was 7.1%. The rate in 3217 AIS patients was 3.6%. The protective benefit of the AIS was statically significant with our metaanalysis using a random effects model.

For those papers that showed a reduced infection rate with AIS, the number needed to treat (NNT) to prevent one shunt infection ranged from 7-59, with a cost savings of \$26 to \$47k per shunt infection and an annual savings of \$90,000 to over \$1.3 million.

Conclusions

There are many variables that determine an instituion's shunt infection rate. Based on our analysis, switching to an AIS will likely decrease the infection rate and provide significant cost savings to the hospital despite the higher cost of the AIS compared to SS.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Identify factors that are predictive of shunt infection 2) Critically evaluate papers that do and do not show a benefit to antibiotic-impregnated shunt systems 3) Identify the typical cost of treating a shunt infection and how an AIS may reduce these costs and to what degree

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