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QUESTION 4: Is there a role for combination antibiotics (i.e., dual or triple) in treating patients with surgical site infection (SSI) following spinal surgery?

RECOMMENDATION: There is insufficient evidence to recommend the routine use of combination antibiotics in the setting of postoperative spine infections. However, there may be a role for combination antibiotics in certain circumstances related to specific pathogens.

LEVEL OF EVIDENCE: Consensus

DELEGATE VOTE: Agree: 87%, Disagree: 13%, Abstain: 0% (Super Majority, Strong Consensus)

RATIONALE

The incidence of postoperative spine infection has been reported as between 0.7 and 16%, with higher rates noted in procedures with hardware implantation [1,2]. The most common organisms isolated are *Staphylococcus aureus*, *Staphylococcus epidermidis*, methicillin-resistant *S. aureus* and *Enterococcus*. Up to 20 to 30% of infections are noted to be poly-microbial [3,4].

Antibiotic treatment is directed at the isolated micro-organism/s and usually only a single anti-microbial agent is used. There are a few reports of dual antibiotic therapy with rifampin, the most common additive agent [3,5]. Rifampin is chosen due to its ability to penetrate biofilms associated with implant-related infections [6]. Evidence from a mouse model has shown that the addition of rifampin to vancomycin led to an increase in bacterial death, but no change in the final outcome from the SSI [7]. There are no clinical studies comparing the use of single to multi-agent antibiotic therapy for postoperative spine infections.

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QUESTION 5: How long should antibiotics be administered after surgical debridement for an acute postsurgical spinal infection?

RECOMMENDATION: For vertebral osteomyelitis: Initial intravenous treatment for one to two weeks, followed by an oral treatment of four to five weeks to reach a total treatment duration of six weeks.

For deep surgical site infections: There is limited knowledge about the ideal duration of antibiotic treatment and which intravenous and/or oral agents should be given. As extrapolated from studies in periprosthetic joint infections (PJIs) and retrospective studies in spine infections, 12 weeks of antibiotic treatment can be recommended in cases with early infection and implant retention, six weeks if the implant is removed and prolonged suppressive treatment in delayed infections without removal of the implant.

LEVEL OF EVIDENCE: Moderate for vertebral osteomyelitis. Limited for surgical site infections after spine surgery

DELEGATE VOTE: Agree: 80%, Disagree: 13%, Abstain: 7% (Super Majority, Strong Consensus)

RATIONALE

Vertebral Osteomyelitis

In vertebral osteomyelitis (spondylodiscitis) without an implant, experts recommend a treatment duration of 6 to 12 weeks [1]. However, a retrospective study over 10 years by Roblot et al. [2] found no difference in relapse rate between 6 and 12 weeks of treatment [2]. An open label, non-inferiority, randomized, controlled trial by Bernard et al. first showed that 6 weeks was not inferior to 12 weeks. In both groups, intravenous treatment was only given for a median time of 14 to 15 days followed by an oral fluoroquinolone and rifampin combination or aminopenicillin (both regimens with high oral bioavailability) [3]. The authors could not see a difference in the proportion of treatment failure between patients given intravenous treatment for more than one week and those for less than one week.