Extended Postoperative Antibiotic Prophylaxis Is Associated with No Clinical Value and Higher Projected Cost Following Adult Spinal Surgery: A Stratified Meta-analysis and Probability-Based Cost Projections

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INTRODUCTION: Balancing prophylactic antibiotic duration for adult spinal surgery entails uncertain decision-making, weighing administration costs against infection risk and long-term antimicrobial resistance. We aimed to determine the cost-effectiveness of different protocols of extended postoperative antibiotic prophylaxis (EPAP) following adult spinal surgery. The comparisons were made as follows: 1. Short course (PAP< 48 hours) versus extended (EPAP> 48 hours) 2. Short (PAP24 hours) versus extended (EPAP72 hours).

METHODS: Several databases were searched for clinical trials comparing short-term protocol (< 48 and 24 hours) to extended (> 48 and 72 hours) of postoperative antimicrobial administration in term of the incidence of surgical site infection (SSI). The average cost and probability of infection were used to determine the projected added costs of medical and surgical management of infection complications.

RESULTS: This study included 11 studies of 11,875 patients whose mean age was 55.9 years. 34% of patients received EPAP and instrumented surgery was performed in 45% of those patients. Both stratified and non-stratified analysis demonstrated that EPAP have no significant value in reducing the incidence of SSI (P=0.46), deep SSI (P=0.82), or superficial SSI (P=0.46). Notably, the EPAP protocols were associated with a significant increase in the length of hospital stay. The sum of average estimated costs of managing all reported infections and length of hospital stay in antibiotic administration duration <48 hours and extended (>48 hours) were $1,546.8 and $2,452.3, respectively.

DISCUSSION AND CONCLUSION: EPAP do not demonstrate any significant reduction in the rate of SSIs following spine surgery. However, these extended protocols were significantly associated with an increase in length of hospital stay and higher overall projected costs.