Ontario Antimicrobial Stewardship Project

Evidence-Based Summary for Short-Course Antimicrobial Therapy:

Surgical Prophylaxis

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1. *A single dose of prophylactic IV antibiotic should be delivered 15 – 60 minutes pre-operatively. For prolonged surgeries (> 4 hours) re-dosing may be needed to maintain adequate tissue concentrations. Post-operative antibiotic prophylaxis is not beneficial and is not recommended.*

   In a systematic review of randomized trials in major surgeries, there was no difference in the rate of surgical site infection (SSI) with single dose compared to multiple dose regimens given for less than or more than 24 hours (combined odds ratio 1.04, 95% CI 0.86-1.27) [1]. The majority of published evidence demonstrates that antimicrobial prophylaxis after incision closure is unnecessary [2,3]. In addition to the lack of benefit of additional doses, prolonged use of prophylactic antimicrobials is associated with the emergence of resistant bacterial strains [2]. The prophylactic antimicrobial should be administered as near to the incision time as possible to achieve low SSI rates [2]. A prospective study demonstrated that administering prophylactic antibiotics within two hours before surgery was associated with the lowest risk of SSI [4]. Based on the available evidence, infusion of the first antimicrobial dose should begin within 60 minutes before incision [2]. If the procedure is prolonged (> 4 hours), re-dosing every 1-2 half-lives of the antimicrobial should provide adequate drug concentrations during the procedure [2].

2. *The appropriate prophylactic antimicrobials targeting the most likely offending organisms should be selected for the type of surgery, taking into consideration the current recommendations in the literature, issues of resistance and patient allergies.*

   An effective prophylactic regimen should be directed against the most likely infecting pathogens. There is little evidence to suggest that the newer antimicrobials with broader antibacterial activity result in lower rates of SSI [5]. For most procedures, a first-generation cephalosporin such as cefazolin is active against the predominant staphylococci and streptococci pathogens. For procedures involving exposure to bowel anaerobes such as *Bacteroides fragilis*, addition of an agent with activities against bowel anaerobes is recommended. In patients with life-threatening allergies to beta-lactam antibiotics, vancomycin or clindamycin can be used as alternatives. Aminoglycosides or fluoroquinolones may be added for activities against gram-negative organisms [6]. The choice of antibiotic should take into account local resistance patterns [2, 5, 6]. Guidelines for the selection of appropriate prophylactic antimicrobials for various procedures are available [5-9].

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