



DOUGLAS COLLEGE

Postoperative Antibiotic Prophylaxis

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CLINICAL QUESTION:

DO PROPHYLACTIC ANTI-BIOTICS HELP REDUCE THE RISK FOR INFECTION IN POSTOPERATIVE PATIENTS?

INTRODUCTION

- Surgical site infections (SSI's) are the second most common adverse event occurring in hospitalized patients (Safe Care Campaign, 2016)
- Wound infections can cause major postoperative complications (i.e. longer hospital stays due to ineffective healing) (Lewis, 2014).
- Health care–associated infections (HAIs) are infections that are acquired from exposure to a microorganism in any health care is delivered setting (Lewis, 2014).
- Antibiotic prophylaxis before surgery may decrease the risk of bacterial infections post operatively (Lewis, 2014).



OBJECTIVE

- Prevent SSI (surgical-site infections)
 - Prevent SSI-related mortality
 - Reduce the duration and cost of care
 - Produce no adverse effects
 - Have no adverse consequences for the microbial flora of the patient or the hospital
- ### HOW DO WE DO THIS?
- By ensuring antimicrobial agent are:
- Active against the pathogens most common to contaminate the site
 - Given in an appropriate dosage and time to ensures adequate serum and tissue concentrations during the time where contamination is likely.
 - Administered for the shortest effective period to minimize adverse effects, the development of resistance, and costs to patients.



NURSING IMPLICATIONS

- According to Singha “Qualities of prophylactic antibiotics include efficacy against predicted bacterial microorganisms most likely to cause infection good tissue penetration to reach wound involved, cost effectiveness, and minimal disturbance to intrinsic body flora.
- The concentration of the antibiotic will be at therapeutic levels at the time of incision, during the surgical procedure, and, ideally, for a few hours postoperative. Therefore, the timing of administration of antibiotics is very important.
- Antibiotics are administered via IV 30 minutes prior to incision
- Antibiotics should not be administered more than 2 hours before the surgery.
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- In the chart above Singhal suggest:

Operation	Expected Pathogens	Recommended Antibiotic
Orthopedic surgery (including prosthesis insertion), cardiac surgery, neurosurgery, breast surgery, noncardiac thoracic procedures	<i>S aureus</i> , coagulase-negative staphylococci	Cefazolin 1-2 g
Appendectomy, biliary procedures	Gram-negative bacilli and anaerobes	Cefazolin 1-2 g
Colorectal surgery	Gram-negative bacilli and anaerobes	Cefotetan 1-2 g or cefoxitin 1-2 g plus oral neomycin 1 g and oral erythromycin 1 g (start 19 h preoperatively for 3 doses)
Gastroduodenal surgery	Gram-negative bacilli and streptococci	Cefazolin 1-2 g
Vascular surgery	<i>S aureus</i> , <i>Staphylococcusepid ermidis</i> , gram-negative bacilli	Cefazolin 1-2 g
Head and neck surgery	<i>S aureus</i> , streptococci, anaerobes and streptococci present in an oropharyngeal approach	Cefazolin 1-2 g
Obstetric and gynecological procedures	Gram-negative bacilli, enterococci, anaerobes, group B streptococci	Cefazolin 1-2 g
Urology procedures	Gram-negative bacilli	Cefazolin 1-2 g

CONTRAINDICATIONS: CEFAZOLIN

- In patients with known hypersensitivity (anaphylaxis, serious skin reaction
- Clostridium difficile colitis
- Moderate to Severe Kidney Impairment
- CEPHALOSPORINS BETALACTAMS



REVIEW OF LITERATURE

- **Sample Size:** 2,847 patients undergoing clean or clean-contaminated surgical procedures
- Patients were assigned to groups on the basis of the relation between the time of their first dose of prophylactic antibiotics and the time of the initial surgical incision.
- 369 patients received antibiotics 2 to 24 hours before the incision.
- 1708 patients in preoperative group received antibiotics 0 to 2 hours before the incision.
- 282 patients in perioperative group received the antibiotics within 3 hours after the incision.
- 488 patients in postoperative group received them 3 hours after the incision but less than 24 hours after surgery.
- Specimens were obtained for culture from all surgical wounds with evidence of infection

RESULTS AND INTERPRETATION

- Among the 1708 patients who received preoperative antibiotics, surgical-wound infections developed in 10 (0.6 percent).
- Among the 282 patients who received perioperative antibiotics, surgical-wound infections developed in 4 (1.4 percent)
- Among the 488 patients who received postoperative antibiotics, surgical-wound infections developed in 16 (3.3 percent)
- Among the 369 patients who received antibiotics 2 to 24 hours before incision, 14 surgical-wound infections (3.8)

CONCLUSION

- Antibiotic prophylaxis reduces the incidence of surgical site infections in post-op patients and should be used in all clean-contaminated procedures. Antibiotic prophylaxis should also be used in clean procedures where the risk for infection could have devastating consequences for the patient (Salkind & Rao, 2011). By using prophylactic antibiotics, we reduce the incidence of infection which leads to a reduction in length of stay and overall hospital costs.
- As stated by American Family Physician, “adherence to the core prevention measures may not reduce surgical site infections to the same degree as adherence to all of the measures,” indicating that further studies must be conducted to determine which combination of infection control measures are the most effective in reducing infection.
- With all details considered, antibiotic prophylaxis does indeed have a positive correlation with reduced incidences of surgical site infections however, antibiotic therapy alone is not enough to compensate for poor infection control (Sinha, Van Assen, & Freidrich, 2014).
- To ensure safe and accurate practice, it is imperative that we understand and follow the specific parameters and guidelines pertaining to the antibiotic of choice such as: duration of prophylaxis, dosage, timing of administration and adverse effects.
- As an adjunct to a timely antibiotic regime, we as nurses must also enforce additional infection control measures, such as hand hygiene and postoperative wound management, to further reduce the risk of primary infections in our post-surgical patients.

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