

Assessing the Appropriate Use of Perioperative Antibiotic Prophylaxis in Colon Procedures in a Tertiary Teaching Institution

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INTRODUCTION

According to the National Nosocomial Infection Surveillance (NNIS), it is estimated that of the 30 million surgical procedures performed each year, approximately 2.6% are complicated by surgical site infections (SSI).¹

These complications have demonstrated to increase mortality, hospital length of stay, and hospitalization expenditures.

RATIONALE

The Surgical Care Improvement Project (SCIP) is a national partnership from more than 20 organizations. It was established in April 2003 to enhance surgical practices with the goal of reducing surgical complications by 25% not later than 2010.²

Mandatory public reporting of healthcare-acquired infections may soon become a reality in New York State. Extreme scrutiny has been placed on surgical site infections as it has been demonstrated to be preventable in nearly 50% with appropriate perioperative antimicrobials.

INSTITUTIONAL GUIDELINES

Appropriate antimicrobial selection

- Cefoxitin for most patients 1 gram for ≤ 70 kg, 2 grams for > 70 kg
- IV ciprofloxacin + IV metronidazole for patients with beta-lactam allergy
- Appropriate timing of antimicrobial regimen
- Administration should occur 30 60 min prior to incision

Appropriate duration

- Re-dosing if procedure exceeds 4 hrs for shortacting antibiotics
- Discontinuation of perioperative antibiotics within 24 hours of wound closure (in the absence of infection)

METHODS

Study was approved by the investigational review board (IRB).

Chart reviews were performed retrospectively for 101 consecutive patients undergoing colon surgeries. The duration of study was 6 months (Jan – Jun 2008).

A patient list was generated using the principal procedure codes that are associated with colon surgeries in patients aged 18 years old or older.

Surgical site infection list was acquired through institution's Infection Control Department.

Data collected included patient demographics, type of procedure performed, selection of antibiotic regimen (includes dose, route, redosing), timing and duration of perioperative antimicrobials, and patient outcome (i.e. surgical site infections).

OUTCOME MEASURES

Non-compliance to Long Island Jewish (LIJ) Hospital surgical prophylaxis guidelines:

- Selection of antibiotic regimen
- Timing of antibiotics
- Weight-based dosing of antibiotics
- Re-dosing for procedures lasting > 4 hours (for antibiotics with short half-lives)
- Duration of perioperative antibiotics

Presence of surgical site infection, if noncompliant with LIJ guidelines

In contrast to the intent-to-treat analysis, the perprotocol analysis for the antibiotic duration excluded any patients with ruptured viscus prior to surgery, as patients were expected to remain on antibiotics for a treatment course

STATISTICAL ANALYSIS

Non-compliance to LIJ surgical prophylaxis guidelines and the association of surgical site infections was assessed using the Fisher's exact test.

RESULTS

Table 1. Non-compliance to LIJ guidelines

| | Pts (n) | # Non- Compliant (%) | 95% Exact Binomial CI |
|------------------------------------|------------|-------------------------|--------------------------|
| Antimicrobial selection | 101 | 21 (20.8%) | 13.4 - 30.0 % |
| Timing of antibiotics | 97 | 13 (13.4%) | 7.3 - 21.8 % |
| Weight-based dosing | 70 | 22 (31.4%) | 20.9 - 43.6 % |
| Re-dosing | 27 | 17 (63.0%) | NA |
| Duration of peri-op antibiotics | 86 | 15 (17.4%) | 10.0 - 27.1 % |

Surgical site infection rate was 8% (8/101)

- 4 organ space infection
- 4 superficial SSI

Of the 8 SSI, 4 cases were deemed to be noncompliant with LIJ surgical prophylaxis guidelines Table 2. Details of the 4 non-compliant cases with

| aoc | umented surgical site infections |
|-------|---|
| n = 2 | Weight-based dosing No re-dosing |
| n = 1 | Weight-based dosing |
| n = 1 | No antibiotics prior to surgery (last dose given > 14 hours before surgery) |

Non-compliance to any part of the guideline resulted in 1 additional day in the hospital (P = NS)

References

- 1. Institute for Healthcare Improvement. Accessed 11/01/2008.
- http://www.ihi.org/ihi/Topics/PatientSafety/SurgicalSiteInfections/SurgicalSiteInfectionsCaseForImprovement
- 2. Bratzler DW, Hunt DR. The surgical infection prevention and surgical care improvement projects: national
- initiatives to improve outcomes for patients having surgery. CID 2006;43:322-30.

DISCUSSION

- Identified re-dosing as an area of potential improvement
- Goal for LIJ is to achieve 100% compliance rate
- No statistical association between non-compliance to guideline and SSI

LIMITATIONS

- Retrospective chart review
- Small sample size
- Study period is short (6 months)
- Failed to address the use of intraoperative antibiotics irrigation

CONCLUSIONS

- There were non-compliance to our institution's surgical prophylaxis guideline
- 4 out of 8 cases of surgical site infections were deemed non-compliant to LIJ guidelines
- Implement interventions to address these areas of deficiencies through conducting inservices, newsletter
- Plan to re-evaluate process post

implementation

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