2203. Serratia and Surgical Site Infections: Risk factors and Epidemiology

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Background. Serratia spp. have been associated with surgical site infection (SSI) outbreaks associated with specific providers, topical creams and contaminated saline products. Patient risk factors for developing infection with this organism have not been extensively studied. We sought to evaluate risk factors for Serratia SSI.

Methods. Cases of Serratia SSI occurring between 2012 and 2016 were identified via an infection control surveillance program. SSI was defined by National Healthcare Safety Network (NHSN) criteria. Controls were randomly selected individuals undergoing similar procedures during the same time frame without identified Serratia SSI. Data was analyzed using partitioning, student T test and chi-square analysis to identify SSI risk factors for Serratia SSI.

Results. During the study period, 17 cases and 34 controls were identified, all of whom were cardiac or vascular surgery patients. Cases were afebrile far more often than females (Relative risk 4.9; 95% CI 0.72–33.37, P = 0.04) Cases were older (mean age [standard error] 55.3 [3.40] vs. 66.3 [4.92] years, P = 0.04), had longer operative times (238 [1].91 vs. 212.5 [2.82] minutes, P = 0.04), and a similar American Society of Anesthesiologist preoperative risk score (3.8 [0.07] vs. 3.1 [0.65], P = 0.03). We did not observe significant differences in body mass index, cardiopulmonary comorbidities, preoperative catherization, or malignancy. In partition analysis, gender, (incision time >180 minutes and age >62) was all highly predictive of Serratia SSI risk (receiver operator characteristic 0.81). Other risk factors screened, including types of vascular access, specific surgeon(s) performing procedures, reoperation, open chest procedures and antecedent cardiac catheterization, were not significantly associated with an increased risk of Serratia SSI. Serratia SSI were associated with a 29% 30-day mortality rate, compared with 5.8% seen in controls (P = 0.02).

Conclusion. Gender, operative time and age are associated with an increase in Serratia SSI risk. Serratia SSI is associated with a high mortality rate. Providers should be vigilant for this organism, particularly in older male patients undergoing complex cardiothoracic or vascular procedures.

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2204. The Relationship Between Payer and Risk of Surgical Site Infection Following Cesarean Delivery

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Background. Medicaid and private health insurance support important access to care for many pregnant women in the United States. The role of health insurance on many outcomes, such as surgical site infection (SSI) following Cesarean delivery (CD), has not been adequately elucidated.

Methods. This retrospective cohort study investigated SSI risk following CDs performed in California hospitals in 2011 among women covered by Medicaid or private health insurance. All CDs were identified from identifiable state inpatient discharge data and linked with National Healthcare Safety Network (NHSN) data to ascertain post-delivery SSI. Characteristics including age, race/ethnicity, BMI, prior CD planned admission, emergency CD, active labor and labor duration, ASA physical status, general anesthesia, wound class, hospital ownership, hospital annual CD count, inter/inter-resident-to-bed ratio, case mix index, disproportionate share adjustment, urban location, and area wage index were obtained from CMS facility, NHSN, and SSI data. Potential effect modification of the payer-SSI relationship was assessed using a multivariable logistic regression model.

Results. 90% of eligible NHSN records linked with a SSI record. The analytic dataset consisted of 387 SSI following 57,143 CDs performed in 196 hospitals. Payer distribution across CDs was 49% Medicaid, 51% private insurer. SSS were reported following 0.74% of CDs among Medicaid recipients and 0.62% among those privately insured (unadjusted risk ratio 1.2, 95% confidence interval 1.0–1.5, P = 0.09). In private insurance recipients women had a higher risk compared with Medicaid recipients (RR: 0.01) increase in adjusted SSI risk compared with women with private insurance. There were no differences in adjusted SSI risk by payer in government (RR: 1.1, 95% CI 0.7–1.8, P = 0.92) or not-for-profit hospitals (RR: 0.9, 95% CI 0.7–1.2, P = 0.52).

Conclusion. Despite accounting for various patient and facility-level factors, Medicaid-insured women experienced higher SSI risk than privately-insured women in for-profit hospitals, but not in government owned or not-for-profit hospitals. Additional studies to understand underlying causes may help target efforts to prevent SSI following CDs among vulnerable patients.

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2205. Should Cefazolin Be the First-line Antimicrobial Prophylaxis Choice in Patients Undergoing Hysterectomy? A Systematic Review and Meta-analysis

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Background. Current practice guidelines non-preferentially recommend cefazolin, cefoxitin, cefotetan, or ampicillin-sulbactam as first line choices for antibiotic prophylaxis in hysterectomy. We undertook a systematic review to determine whether cefazolin, with no anti-anaerobic activity, is as effective as β-lactam antibiotics with anti-anaerobic activity at preventing surgical site-infection (SSI) after abdominal or vaginal hysterectomy.

Methods. We searched PubMed, Scopus, Web of Science, Cochrane Central, and conference proceedings for randomized controlled trials (RCT) in any language up to May 16, 2016. Main search terms included cephalosporins, antibiotic prophylaxis, hysterectomy, surgical wound infection, clinical trials, and random allocation. We included only RCT that measured SSI - outcomes: deep, organ space, pelvic, deep, or organ space. We excluded trials of β-lactams no longer in clinical use. We used predefined data extraction templates, including bias assessment indicators, and performed meta-analyses with random-effects models.

Results. Fourteen RCTs met inclusion criteria. There were 98 (5%) SSI among 1,983 patients in the cefazolin group, and 78 (4%) SSI among 1,772 patients in the comparator β-lactam (cefoxitin, cefotetan, cefotaxime, ceftriaxone, ampicillin, amoxicillin/clavulinate, or penicillin) group. The summary estimate showed no significant benefit for cefazolin vs. other β-lactam in reducing SSI (Risk Ratio 1.19; 95% CI 0.88 – 1.62, P = 0.23). Cefazolin had a higher SSI risk when compared with cefoxitin, cefotetan, or amoxicillin/clavulanate (Risk Ratio 1.56; 95% CI 0.99–2.49, P = 0.06). Most studies were limited to hysterectomies for benign indications, had variability in prophylaxis duration (single vs. multiple doses) and had unclear or high risk of bias.

Conclusion. β-lactam antibiotics with good anti-anaerobic spectrum may be preferable to cefazolin for SSI prevention post-abdominal or vaginal hysterectomy. Antimicrobial prophylaxis for hysterectomy in the setting of advanced malignancy deserves further study.

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