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 under the same institutional review board.”

**Results.** During the study period, 17 cases and 34 controls were identified, all of whom were cardiac or vascular surgery patients. Males were afflicted 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] 55.1[3.40] vs. 66.3[4.92] years, P = 0.04). Had longer operative times (238.1[19.1] vs. 212.5[28.2] minutes, P = 0.01), and a trend for higher SSI risk by payer in government owned or not-for-profit hospitals (RR: 1.1, 95% CI 0.7–1.8, P = 0.92) or 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 and reduce rates of SSI.

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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, ceftoxitin, 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 all RCT that measured SSI – outcomes measured included superficial, 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 1,963 patients in the cefazolin group, and 78 (4%) SSI among 1,772 patients in the comparator β-lactam (ceftoxitin, cefotetan, cefotaxime, ceftriaxone, ampicillin, amoxicillin/clavulanate, 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 – 1.56). Celecoxib had a 2.6 (95% CI 1.2 – 5.4, P = 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 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 and reduce rates of SSI.

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2204. The Relationship Between Payer and Risk of Surgical Site Infection Following Cesarean Delivery
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**Background.** Both 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 evaluated.

**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 obtained from identifiable state inpatient databases 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, intermenstrual CD ratio, case mix index, disproporionate share adjustment, urban location, and area wage index were obtained from CMS facility, NHISS, and SID 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 SID record. The analytic dataset consisted of 387 SSIs following 57,143 CDs performed in 196 hospitals. Payer distribution across CDs was 49% Medicaid, 51% private insurer. SSIs 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 pair analyses, Medicaid women had a greater CD rate (95% CI 1.2–5.4, P = 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 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 and reduce rates of SSI.

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2206. Surgical Site Infections after Colon Surgery: What the SIR Doesn’t Tell You
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**Background.** There is limited data on incidence of MDROs colonization and outcomes in patients undergoing elective orthopedic surgery.

**Methods.** We performed MDROs surveillance screening (swabs from nose, throat, groin, and rectum) in patients undergoing elective orthopedic surgery at the Thammassat University Hospital between March and August 2016. MDROs were defined as Gram-negative bacteria (GNB) possessing extended-spectrum β-lactams (ESBLs), Carbapenem-resistant Enterobacteriaceae (CRE), and non-lactose fermenting GNB resistant to at least 3 antibiotic classes, methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin-resistant enterococci (VRE). MDROs were identified by the Vectra 2 automated system. Antimicrobial susceptibility testing (disk diffusion test) was performed using the CLSI Interpretive Guidelines. Incidence of MDROs colonization upon admission was determined. Patient’s clinical characteristics, risk factors for MDROs infection, procedure types and antibiotic prophylaxis were prospectively collected. Surgical sites infections (SSIs) and complications up to 6 months after surgery among the patients with and without MDROs colonization were compared.

**Results.** Of 384 swabs tested from 96 patients (median age, 58 years), ESBL-producing *Escherichia coli* (ESBL-E. coli) was identified in 31 rectal swabs (32.3%) and 7 (7.3%) were diagnosed with SSIs. A higher rate of SSIs was found among patients with ESBL-E. coli colonization (6/31, 19.4%), compared with patient without ESBL-E. coli colonization (1/65, 1.5%; P = 0.004, OR 15.4, 95% CI 1.7–356.3). From the multivariate logistic regression analysis, SSIs were significantly associated with ESBL-E. coli colonization (P = 0.009, adjusted OR 18.3, 95% CI 2.1–162.9). In addition, from the multivariate logistic regression analysis, ESBL-E. coli was a significantly risk factor associated with SSIs (6/7, 85.7%, P = 0.014, adjusted OR 16.5, 95% CI 1.8–153.4).

**Conclusion.** Greater efforts for a high incidence of ESBL-E. coli colonization and rate of SSIs in patients who had elective orthopedic surgery. These patients did not have any other risk factors for MDROs infection. Active screening for colonization of ESBL-producing pathogens may be necessary to guide appropriate antibiotic prophylaxis to reduce rates of SSIs.

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Background. The National Healthcare Safety Network (NHSN) complex 30 day surgical site infection (SSI) model uses diabetes, American Society of Anesthesiology (ASA) score, gender, age, body mass index (BMI), closure technique and oncology hospital status to determine the standardized infection ratio (SIR) for SSI after colon surgery in adult patients. This is an improvement over past models, but we hypothesized that this model still overlooks non-modifiable patient factors such as inflammatory bowel disease (IBD).

Methods. We identified all colon surgeries from the first quarter of 2013 through the third quarter of 2016 reportable to the NHSN. Each case had a SSI risk score based on the NHSN SIR between 0 and 1. Patient billing data was used to identify International Classification of Disease (ICD) 9 and 10 codes pertinent to the Charlson comorbidity index (CCI) and IBD. The risk of SSI for IBD patients vs. others was calculated using Chi-squared analysis and multivariate models adjusting for CCI as well as the NHSN colon surgery model.

Results. In univariate analysis NHSN risk score, CCI score and IBD were strongly associated with SSI. After adjusting for CCI and NHSN, alone or in combination, IBD remained significantly associated with risk for SSI.

Conclusion. IBD is a non-modifiable risk factor for SSI after colon surgery that is not accounted for in the NHSN model. In addition, the significant of the CCI suggests there may be other patient factors contributing to SSI risk. Further investigation to assess the significance of IBD and other comorbidities and risk factors is warranted.

Hospitals that care for more complex patients may be unfairly penalized under the current NHSN model.

Table: Colon Surgery SSI Risk Factors

| Variable                  | Mean (SD)   | OR P value |
|---------------------------|-------------|------------|
| NHSN model                | 0.03 (0.01) | 0.02       |
| CCI score                 | 5.47 (3.69) | 0.01       |
| IBD                       | 57.6        | (12.55%)   |
| IBD adjusted for CCI      | 2.19 (1.54– |
| NHSN adjusted for CCI     | 1.73 (1.23– |
| NHSN adjusted for CCI     | 2.19 (1.54– |

*Modified CCI eliminating age, diabetes components to minimize colinearity with NHSN risk score.

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2207. Risk Factors of Surgical Site Infections after Colon Surgery in Community Hospitals: A Multicenter Retrospective Cohort Study

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Background. Risk factors for surgical site infections (SSI) after colon surgery (COLO) in community hospitals have not been described in detail.

Methods. We performed a retrospective cohort study of adult patients who underwent COLO procedures between Jan 15, 2015, and June 16, 2016, in a large cohort (n = 37, median bed size=214; interquartile range [IQR] 142, 290) of community hospitals. SSI was defined using CDC/NHSN criteria; surveillance was performed systematically across all study hospitals. We collected data on several potential risk factors, including age, gender, body mass index (BMI), diabetes, American Society of Anesthesiologists (ASA) score, wound classification, operation time, emergency status, procedure type, hospital bed size (small ≤ 200 beds), and annual volume (<100 COLO = low volume; ≥100 COLO = high volume). We created a multivariable logistic regression model to identify factors independently associated with SSI. Two-sided P values of less than 0.05 were used to indicate statistical significance.

Results. 7376 patients underwent COLO during the study period. The median annual number of procedures performed by these hospitals was 110 (IQR, 69, 239). 930 (12.6%) procedures were emergency operations, and 3105 (42%) were laparoscopic procedures. 319 SSIs were identified including all types of SSI, and the overall SSI incidence rate was 4.3%. Several independent risk factors for COLO SSI were identified on multivariable regression, including emergency procedure status (odds ratio [OR] = 1.99, 95% confidential interval [CI] 1.47–2.69), bed size over 200 beds (OR = 1.51, 95% CI 1.12–2.03), ASA score 4–5 (OR=1.46, 95% CI 1.04–2.06), operation time over 75th percentile (OR=1.37, 95% CI 1.02–1.83), and obesity (BMI > 30 kg/m²) (OR=1.29, 95% CI 1.03–1.63). Two factors were associated with decreased risk of SSI: age over 75 years (OR=0.51, 95% CI 0.36–0.74), and laparoscopy (OR=0.69, 95% CI 0.54–0.88). The c-index of the model was 0.65.

Conclusion. Emergency procedure status was the most important risk factor for COLO SSI in our cohort of community hospitals. This variable is not included in the current NHSN methods for risk adjustment.

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