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Session: P-42. HAI: Surgical Site Infections

Background. A survey was conducted in three hospitals, between July 2016 and June 2018, about surgical site infection (SSI) in patients undergoing surgeries to correct aortic artery aneurysms in the city of Belo Horizonte, with more than 3,000,000 of inhabitants. The general objective is to statistically evaluate such incidences and enable an analysis of the predictive power of SSI, through MLP (Multilayer Perceptron) pattern recognition algorithms.

Methods. Through the Hospital Infection Control Committees (CCIH) of the hospitals involved in the research, data collection on SSI was carried out. Such data is used in the analysis during your routine SSI surveillance procedures. Thus, three procedures were performed: a treatment of the database collected for use of intact samples; a statistical analysis on the profile of the collected hospitals and; an assessment of the predictive power of five types of MLPs (Backpropagation Standard, Momentum, Resilient Propagation, Weight Decay and Quick Propagation) for SSI prediction. The MLPs were tested with 3, 5, 7 and 10 neurons in the hidden layer and with a division of the database for the resampling process (65% or 75% for testing, 35% or 25% for validation). They were compared by measuring the AUC (Area Under the Curve - ranging from 0 to 1) for each of the configurations.

Results. From 600 records, 575 were complete for analysis. It was found that: the average age is 68 years (from 24 to 98 years); the average hospital stay is 9 days (with a maximum of 127 days), the death rate reached 6.43% and the SSI rate 2.78%. A maximum prediction power of 0.75 was found.

Conclusion. There was a loss of 4% of the database samples due to the presence of noise. It was possible to evaluate the profile of the three hospitals. The predictive process presented configurations with results that reached 0.75, which promises the use of the structure for the monitoring of automated SSI for patients undergoing surgery to correct aortic artery aneurysms. To optimize data collection, enable other hospitals to use the prediction tool and minimize noise from the database, two mobile application were developed: one for monitoring the patient in the hospital and another for monitoring after hospital discharge. The SSI prediction analysis tool is available at www.nois.org.br.

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881. Efficacy of Antibiotic Prophylaxis with Vancomycin in Cardiothoracic Surgery

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Session: P-42. HAI: Surgical Site Infections

Background. Due to the high incidence of methicillin-resistant *Staphylococcus aureus* (MRSA) at the Detroit Medical Center, vancomycin is now routinely part of the prophylaxis regimen for cardiothoracic (CT) surgery. The study aims to compare the rate and types of surgical site infections (SSIs) when vancomycin is added to cefazolin for CT surgery compared to cefazolin alone.

Methods. This was a retrospective cohort study conducted at two university-affiliated hospitals. Patients who underwent CT surgery between January 2008 and August 2017 and had a readmission for SSI within 90 days of procedure were included. Patients who received cefazolin were compared to patients who received both cefazolin and vancomycin for CT surgery prophylaxis. The primary outcome was incidence of SSIs within 90 days of surgery as defined by the Centers for Disease Control and National Healthcare Safety Network.

Results. Out of 828 patients who underwent CT surgeries, there were 32 patients readmitted within 90 days for SSI. SSI occurred in 4.7% of patients who received cefazolin monotherapy, and 2.4% of patients who received both cefazolin and vancomycin (p=0.095). There was no discernible difference in types of SSI between groups. Pathogens were isolated in 78% of SSIs, with 75% Gram-positive and 19% Gram-negative organisms. SSIs resulted in an average 9.8 days in the hospital and 28.9 days of antibiotic therapy, and led to a total of 15 additional procedures.

Conclusion. Vancomycin added to cefazolin for prophylaxis in CT surgery resulted in lower incidence of SSI, however the difference was not statistically significant.

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882. Evaluating the Risk Factors in Postoperative Infections Following Hysterectomy Procedures: Is Antibiotic Prophylaxis the Issue?

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Session: P-42. HAI: Surgical Site Infections

Background. Infectious complications after hysterectomy procedures are associated with an additional financial burden and length of stay for patients. In addition, post-hysterectomy surgical site infection is a metric tied to hospital ranking and financial penalties. The objective of this study was to evaluate the appropriateness of surgical prophylaxis for hysterectomies in patients with postoperative infections.

Methods. This is a 1:1 case-control study, matched based on the year of surgery and surgeon performing the procedure, of women ≥ 18 years who underwent hysterectomies between 2013 and 2019. Cases were diagnosed with infection(s) attributable to the procedure within 90 days post-hysterectomy. Patients who did not receive prophylaxis were excluded. The primary outcome of this study was to determine if postoperative infections following hysterectomies were due to inappropriate antibiotic prophylaxis. Secondary outcomes included hospital readmission and mortality. The primary statistical tests utilized included descriptive statistics and chi-square test.

Results. The study included 86 patients, 43 in each group. Thirty percent of cases and 7% of controls received inappropriate prophylaxis. For cases, reason for inappropriateness was due to underdosing of cefazolin (38%) and gentamicin (54%), and overdosing of cefotetan (8%). For controls, cefazolin (33%) and gentamicin (67%) were underdosed. Twenty-three percent of the cases and 14% of the controls received inappropriate intraoperative redosing. The most common reason for inappropriateness was timing (40% of cases vs 50% of controls) followed by missed intraoperative redosing (50% of cases vs 33% of controls). No difference was observed in the proportion of cases and proportion of controls who received inappropriate treatment (p=0.21). Eighty-eight percent of cases and 5% of controls were readmitted within 3 months (p< 0.0001). Mortality was not noted in either group.

Conclusion. In this study, there was no statistically significant association between inappropriate antibiotic prophylaxis and infection. There was still a high incidence of inappropriate antibiotic prophylaxis in the cases. Therefore, education of providers on antibiotic dosing and criteria for intraoperative redosing is warranted.

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883. Evaluation of Post-operative Antibiotic Prophylaxis in Patients Undergoing Urologic Procedures

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Session: P-42. HAI: Surgical Site Infections

Background. Many national guidelines do not recommend post-operative antibiotic prophylaxis due to lack of literature supporting its use; however, they are frequently prescribed at ChristianaCare for urologic procedures. Use of post-operative antibiotics has not correlated with reduction in post-operative infections, and has been show to increase risk for resistant infections, *Clostridiodes difficile* (*C. difficile*) and acute kidney injury (AKI).

Methods. A single center retrospective chart review was conducted to evaluate endpoints of patients who underwent a urologic procedure and received post-operative antibiotics (intervention group) compared to those who did not (control group) from June 1st 2018 to September 1st 2019. The primary endpoint was to compare the incidence of post-operative infections, including surgical site infections (SSIs), bacteremia, and urinary tract infections (UTIs) between the intervention and control groups. The secondary endpoints included comparing the incidence of prespecified adverse outcomes, between the two groups.

Results. A total of 250 patients were included in this study. Baseline demographics were similar across a number of characteristics in both groups. There was no difference between the intervention and control groups in the incidence of post-operative bacteremia (p = 0.608), SSIs (p = 0.491) and 30 day UTIs (p = 0.307). The rate of AKI between both groups were similar. There was a higher percentage of resistant organisms seen in the intervention group compared to the control group (21.4 % vs. 16.7%). The intervention group experienced an increase in post-operative antibiotic related adverse effects. Although a small number of patients were tested for *C. difficile*, there was one positive *C. difficile* PCR in the intervention group compared to zero in the control group.

Conclusion. The results of this study support withholding post-operative antibiotics in urologic procedures given no benefit in reducing post-operative infections and potential to increase adverse effects and development of resistant organisms. Efforts to change this current practice at our institution will be implemented via collaboration with the urology section and review of current order sets.

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884. Evaluation of Surgical Site Infections in Solid Organ Transplant Recipients with Beta-Lactam Allergies

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