810. Cardiac Pacemaker Implantation Surgery: Automated Prediction of Surgical Site Infection
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Session: P-44. HAI: Surgical Site Infections

Background. A research focused on surgical site infection (SSI) was performed in patients undergoing cardiac pacemaker implantation surgery. The main objective is to statistically evaluate such incidence and enable a study of the prediction power of SSI through pattern recognition algorithms, in this case the Multilayer Perceptron (MLP).

Methods. Data were collected from five hospitals in the city of Belo Horizonte (more than 3,000,000 inhabitants), between July 2016 and June 2018, on SSI by the Hospital Infection Control Committees (CCIH) of the hospitals involved in the search. All data used in the analysis during their routine SSI surveillance procedures were collected. So, three procedures were performed: a treatment of the collected database for use of intact samples; a statistical analysis on the profile of the hospitals collected and, an assessment of the predictive power of five types of MLP (Backpropagation Standard, Momentum, Resilient Propagation, Weight Decay, and Quick Propagation) for SSI prediction. MLPs were tested with 3, 5, 7, and 10 hidden layer neurons and a database split for the resampling process (65% and 75% for testing, 35% and 25% for validation). They were compared by measuring AUC (Area Under the Curve - from 0 to 1) presented for each of the configurations.

Results. From 1394, 572 records were: 21% of deaths and 2.4% patients had SSI, from the confirmed SSI cases, approximately 64.3% had sites classified as “clean”; length of hospital stay ranged from 0 to 175 days (from 1 to 70 days); the average age is 67 years. The prediction power of SSI, the experiments achieved from 0.409 to 0.722.

Conclusion. Despite the considerable loss rate of more than 65% of the database samples due to the presence of noise, it was possible to have a relevant sampling for the profile evaluation of Belo Horizonte hospitals. Moreover, for the predictive power, although some configurations reached 0.722. To optimize data collection and enable other hospitals to use the SSI prediction tool (available in www.nois.org.br), two mobile applications were developed: one for monitoring the patient in the hospital and the other for monitoring after hospital discharge.

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811. Impact of the COVID-19 Pandemic on Surgical Volume and Surgical Site Infections (SSI) in a Large Network of Community Hospitals
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Session: P-44. HAI: Surgical Site Infections

Background. The COVID-19 pandemic significantly impacted hospitalizations and healthcare utilization. Diversion of infection prevention resources toward COVID-19 mitigation limited routine infection prevention activities such as rounding, observations, and education in all areas, including the peri-operative space. There were also changes in surgical care delivery. The impact of the COVID-19 pandemic on SSI rates has not been well described, especially in community hospitals.

Methods. We performed a retrospective cohort study analyzing prospectively collected data on SSIs from 45 community hospitals in the southeastern United States from 1/2018 to 12/2020. We included the 14 most commonly performed operative procedure categories, as defined by the National Healthcare Safety Network. Coronary bypass grafting was included a priori due to its clinical significance. Only facilities enrolled in the network for the full three-year period were included. We defined the pre-pandemic time period from 1/1/18 to 2/29/20 and the pandemic period from 3/1/20 to 12/31/20. We compared monthly and quarterly median procedure totals and SSI prevalence rates (PR) between the pre-pandemic and pandemic periods using Poisson regression.

Results. Pre-pandemic median monthly procedure volume was 384 (IQR 192-999) and the pre-pandemic SSI PR per 100 cases was 0.98 (IQR 0.90-1.04). There was a transient decline in surgical cases beginning in March 2020, reaching a nadir of 185 cases in April, followed by a return to pre-pandemic volume by June (figure 1). Overall and procedure-specific SSI PRs were not significantly different in the COVID-19 period relative to the pre-pandemic period (total PR per 100 cases 0.96 and 0.97, respectively, figure 2). However, when stratified by quarter and year, there was a trend toward increased SSI PR in the second quarter of 2020 with a PRR of 1.15 (95% CI 0.96-1.39, table 1).

Conclusion. The decline in surgical procedures early in the pandemic was short-lived in our community hospital network. Although there was no overall change in the SSI PR during the study period, there was a trend toward increased SSIs in the early phase of the pandemic (figure 3). This trend could be related to deferred elective cases or to a shift in infection prevention efforts to outbreak management.

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812. The Impact of Post-Operative Cephalexin on Surgical Site (SSI) Infections During a Cefazolin Shortage
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