Figure 1. Antibiotic Distribution According to World Health Organization (WHO) Access, Watch and Reserve (AWaRe) Classification

Figure 2. Antibiotic Distribution by Class in Okinawan Hospitals

Disclosures. All Authors: No reported disclosures

173. Antimicrobial Stewardship Education Changes Prescribing Behavior and Reduces Treatment of Asymptomatic Bacteriuria

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Session: P-09. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

Background. Treatment of asymptomatic bacteriuria (ASB) outside of pregnancy and urological procedures increases the risk of antibiotic resistance without improving outcomes. At Olive View UCLA Medical Center (SYC), the CDC U.S. Antibiotic Awareness Week (AAW) was utilized as a platform to promote antimicrobial stewardship (AS) for ASB. We evaluated the incidence of antibiotic treatment of ASB pre-AAW vs post-AAW, and the impact of AS education on future prescribing practices for ASB.

Methods. In this single-center retrospective observational study, AS education defining ASB vs urinary tract infection (UTI) was provided via visual aids distributed throughout the hospital during AAW from 11/18/2020 to 11/24/2020 (Figure 1). All positive urine cultures (Ucs) for adult inpatients were reviewed prior to AAW from 9/2020 to 11/2020 and after AAW from 12/2020 to 1/2021. Patients were excluded if they were unable to report UTI symptoms, pregnant, or undergoing urological procedure. The incidence of ASB treatment pre- and post-AAW was compared. A survey was sent to providers to compare the impact on antibiotic prescribing behavior for ASB pre- and post-AAW. Fisher’s exact and Chi-squared tests were used for statistical analysis.

Results. A total of 260 cases met study eligibility. In the pre-AAW group, 56 of 131 cases presented with ASB, of which 16 were treated with antibiotics (28.6%). In the post-AAW group, 55 of 129 cases presented with ASB, and 5 were treated with antibiotics (9.1%). Antibiotics were prescribed more often for patients with ASB in the pre-AAW group compared to those in the post-AAW group (p=0.014). Forty providers completed the survey, of which 97.5% had seen the visual aids, 70% had found the education “very” or “extremely” useful, and 43.6% reported they “always or sometimes” treated ASB pre-AAW vs 15% post-AAW (p< 0.01).

Conclusion. AS posters and education defining ASB significantly decreased the treatment of ASB. AAW education on ASB antimicrobial stewardship demonstrated a high value and shifted prescribing behavior to avoid antibiotic treatment of ASB. A similar approach to deliver provider education could serve as a valuable model to change provider AS practices for ASB.

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174. Development of a Machine Learning Prediction Model to Select Empirical Antibiotics in Patients with Clinically Suspected Urinary Tract Infection using Urine Culture Data

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Session: P-09. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

Background. Increasing antimicrobial resistance and the emergence of superbugs are problems globally. Inappropriate empiric antibiotic use would be a reason to cause antibiotic resistance. However, it has been a challenge to prescribe empiric antibiotics as it is difficult to identify the causative organism beforehand. In this study, we aimed to develop a prediction model to estimate the risk of antibiotics resistance using urine culture tests.

Methods. The study population included adult patients who had at least one of the results from a urine culture test and antibiotic susceptibility tests (from ampicillin, ceftriaxone, ciprofloxacin, gentamicin, levofloxacin, nitrofurantoin, tetracycline, trimethoprim/sulfaethoxazole) on admission to Ajou University Medical Center. Outcomes were defined as a resistant or intermediate susceptibility. Candidate predictors were diagnosis, prescription, visit, laboratory, procedures of the study population. We split data to 75:25 for training and test. Lasso logistic regression (LLR), extreme gradient boosting machine (XGB), Random Forest (RF) were used as model algorithms. The models were evaluated by an area under the curve of receiver operator characteristics curve (AUROC), precision-recall curve (AUPRC), and its calibration. All codes are available in https://github.com/ABMJ/AbsBetterChoice

Results. Total 33 covariates were selected for final prediction models. The RF showed the highest AUROC in the ceftriaxone and tetracycline models (0.823, 0.826, respectively). The XGB presented the highest AUROC for ciprofloxacin and nitrofurantoin (0.731, 0.706, respectively). The AUROC of RF and the XGB were the same in an ampicillin model (0.633). For gentamicin, levofloxacin, and trimethoprim/sulfaethoxazole, the AUROC of LLR was the highest (0.838, 0.831, 0.615, respectively). Among the models, the AUROC was the highest in the gentamicin model regardless of algorithms. All calibrations of the models were acceptable.

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Table 1 Overall performance of antibiotics susceptibility test prediction model with three different machine-learning algorithms

175. Assessment of Institutional Uptake of Vancomycin AUC Monitoring One-Year Post Guideline Publication in Hospitals Across the United States

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Session: P-09. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

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Methods. The study population included adult patients who had at least one of the results from a urine culture test and antibiotic susceptibility tests (from ampicillin, ceftriaxone, ciprofloxacin, gentamicin, levofloxacin, nitrofurantoin, tetracycline, trimethoprim/sulfaethoxazole) on admission to Ajou University Medical Center. Outcomes were defined as a resistant or intermediate susceptibility. Candidate predictors were diagnosis, prescription, visit, laboratory, procedures of the study population. We split data to 75:25 for training and test. Lasso logistic regression (LLR), extreme gradient boosting machine (XGB), Random Forest (RF) were used as model algorithms. The models were evaluated by an area under the curve of receiver operator characteristics curve (AUROC), precision-recall curve (AUPRC), and its calibration. All codes are available in https://github.com/ABMJ/AbsBetterChoice

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Disclosures. All Authors: No reported disclosures

Conclusion. We developed prediction models with competing performances of discrimination and calibration. It would contribute to the proper selection of empiric antibiotics susceptible to those causative pathogens in hospitalized patients with a clinically suspected urinary tract infection.

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