Title:
Retrospective Review of Drug Resistance in Pneumonia Score Recommendation and Antibiotic Selection for Patients in the Emergency Department with Community Acquired Pneumonia

Purpose:
The purpose of this study was to compare current practice to the drug resistance in pneumonia (DRIP) score recommendation when selecting empiric antibiotics for community acquired pneumonia (CAP). Results will be used to determine if a DRIP PowerPlan would increase appropriate coverage with empiric antibiotics and minimize use of broad-spectrum antibiotics. Community acquired pneumonia is a leading cause of hospitalizations annually, estimated to account for 1.5 million admissions per a study conducted by the University of Louisville in 2016. Drug resistant pathogens (DRPs), such as methicillin-resistant *Staphylococcus aureus* (MRSA), *Pseudomonas aeruginosa*, and drug resistant *Enterobacteriaceae* species, complicate the empirical antibiotic selection. To better predict if a patient has the presence of DRPs warranting treatment with broad spectrum antibiotics, the DRIP score was developed.

Methods:
This retrospective study included patients 18 years and older, diagnosed with community acquired pneumonia (J18.9), who received antibiotics in the ED and were admitted to LMH Health between October 2019 and March 2020. Patients were excluded if there was insufficient information to calculate a DRIP score. The score consisted of ten risk factors, which fall into two categories: major and minor. Major risk factors included prior antibiotic use, residence in a long-term care facility, use of tube feeding, and prior history of drug resistance. Major risk factors were assigned two points. Minor risk factors included prior hospitalization, chronic pulmonary disease, poor functional status, prior use of a PPI or H2 blocker, active wound care, and prior MRSA colonization. Minor risk factors were assigned one point. After all points were added, if the score was <4, the patient was at low risk of having DRPs and narrow spectrum antibiotics were indicated. If the score was ≥4, the patient was considered to be at a high risk for DRPs and broad-spectrum antibiotics were indicated. Statistical analysis was performed using the chi square test.

Results:
Data analysis consisted of 58 patients who met study criteria. The average age of patients included was 70, and 52% of the patient population was male. The primary outcome was to determine the percentage of patients who received antibiotics consistent with the DRIP score recommendation. 33% of patients received empiric therapy that was not consistent with the DRIP score recommendation (16% received too broad antibiotics, 17% received too narrow antibiotics). Secondary outcomes measured were the number of patients whose calculated DRIP score was ≥4 (36%), those who received broad spectrum antibiotics (41%), and the percentage of patients whose antibiotic spectrum changed after they were admitted (41%). The most common major risk factors were prior antibiotic use and residence in a long-term care facility. When broad spectrum antibiotics were chosen, Zosyn (9%) and vancomycin (6%) were the most used agents.

Conclusions:
Chi square analysis indicated that inconsistencies with the antibiotics the patient received and what the DRIP score recommended was insignificant. However, antibiotic selection was not in line with the DRIP score recommendation 33% of the time. This suggests there is room for improvement in LMH Health's process of empiric selection for CAP. Therefore, LMH Health could work toward better compliance with DRIP Score recommendations by providing education to the ED staff and/or implementing a PowerPlan to assist the physicians in empiric selection of therapy using the DRIP score risk factors.