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Title: *Analysis of antibiotic use at Alton Memorial Hospital following antimicrobial stewardship education*

Abstract

Introduction:

Antimicrobial stewardship programs are essential to improving patient care. Alton Memorial Hospital's program discovered their vancomycin and piperacillin/tazobactam use was higher than surrounding hospitals. With serious adverse events associated with these antibiotics, prescribers were educated on potential risks and alternative options. Following education, the use of these antibiotics decreased. The purpose of this study was to determine if decreased vancomycin and piperacillin/tazobactam usage was associated with increased use of other antibiotics.

Methods:

The SIUE institutional review board deemed this observational study exempt. Antibiotic reports were analyzed for data on days of therapy (DOT) per 1,000 patient days. Reports for February-July 2019 were analyzed as the post-education period. The reports for February-July 2018 provided the pre-education data. Analysis included fourteen antibiotics with overlapping spectrum of activity with vancomycin or piperacillin/tazobactam. The primary outcome was change in DOT per 1,000 patient days pre-education to post-education for each antibiotic. The secondary outcome was change in total antibiotic DOT per 1,000 patient days from 2018 to 2019. A Student's t-test was completed for the secondary outcome with alpha set at 0.05.

Results:

From 2018 to 2019, vancomycin and piperacillin/tazobactam's DOT per 1,000 patient days decreased. Nine antibiotics had an increase during this period. Notable increases included cefepime by 163%, meropenem by 68%, and linezolid by 50%. Antibiotics experiencing decreases included ceftaroline by 62%, ertapenem by 30%, ciprofloxacin by 28%, and levofloxacin by 18%. The change in total antibiotic DOT per 1,000 patient days during the study period was 58, with a P-value of 0.80.

Conclusion:

When vancomycin and piperacillin/tazobactam use decreased following antimicrobial stewardship education, an associated increase in use of antibiotics with similar spectrums of activity occurred. The change in total DOT per 1,000 patient days between all antibiotics pre-education to post-education was not statistically significant, indicated by a P-value > 0.05 .