Pharmacist Reporting of Antimicrobial Interventions Post Antimicrobial Stewardship Implementation

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BACKGROUND

An Antimicrobial Stewardship Program (ASP) is a team-based multidisciplinary approach to enhancing utilization of antimicrobials. According to the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA), an appropriate ASP is one whose primary goal is to "optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms and the emergence of resistance." The role of the ASP clinical pharmacist includes optimizing antibiotic regimens through: prospective audits of antimicrobial usage, drug information, de-escalation of therapy, dose optimization, and intravenous to oral conversions. In January of 2011, a multidisciplinary ASP was established at Interim Louisiana Hospital (ILH), a center of excellence teaching institution that provides medical care to indigent and uninsured patients in the New Orleans area.

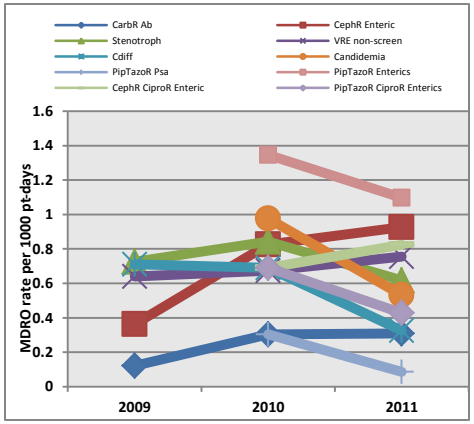
PURPOSE

The purpose of this study is to evaluate the impact of a clinical pharmacy team on the frequency and categories of antimicrobial interventions. A secondary objective is to determine the cost-savings benefit of the ASP team and stabilization of microbial resistance patterns.

ANTIBIOTIC INTERVENTIONS

Intervention Type	2010	2011	p-value
Antibiotic Interventions	**629**	**1378**	**.000***
De-escalation	**5 (0.8%)**	**164 (12%)**	**.000***
Dose Adjustment	119 (19%)	279 (20%)	.267
Initiation of Therapy	218 (35%)	202 (15%)	.000*
Lab Value Interpretation	0 (0%)	17 (1.2%)	.002*
Allergy Prevented	65 (10%)	91 (6.6%)	.003*
Drug Info	59 (9%)	73 (5.3%)	.001*
Drug Interaction	7 (1%)	12 (0.9%)	.383
IV to PO	10 (1.5%)	71 (5%)	.003*
Pharmacokinetic	**54 (8.6%)**	**394 (29%)**	**.000***

MDRO RATES



COST SAVING INFORMATION PRE AND POST ASP IMPLEMENTATION

	2010	2011
Antibiotic expenditure	$1,976,570.00	$1,367,663.00
% Antimicrobial of total drug expenditures	24.42%	18.61%
ABX Days of Therapy	73,219	66,154
ABX Cost/ABX Days	$27.00	$20.67
Savings Based on ABX Days of Therapy		$418,185.10
Intravenous to Oral/ Renal Dosing savings		$40,000 /$275,661

METHODS

Antimicrobial interventions reported in the year of 2010, prior to ASP implementation, and 2011, post ASP implementation, will be obtained from Pharmacy OneSource® Quantifi®. Pharmacy OneSource® Quantifi® is a hospital based software that records interventions per pharmacist per day.

- The frequency of antimicrobial interventions per drug class and the percent of interventions per category will be compared using descriptive statistics and Fishers Exact analysis using SPSS19.
- The cost savings impact of ASP implementation was determined by evaluating pharmacy-purchasing data.
- Cost data was compared using hospital wide and patient day utilization of antibiotics.
- Anti-microbial resistance patterns comparing the 2010 and 2011 antibiograms were analyzed using ANOVA analysis to determine if the ASP initiative has contributed to stabilization of resistance patterns.

RESULTS

Regression analysis indicated a significant increase in total number of interventions reported in 2010 versus 2011 (629 versus 1378, p=.000). The percentage of total interventions in the categories of "Pharmacokinetic Monitoring" (8.6% to 29%) and "De-escalation" (0.8% to 12%) increased significantly. In addition, pharmacy purchasing data showed a significant reduction in the percent expenditure on antimicrobials (24.42% to 18.61%) of pharmacy's total medication purchases, a 30% reduction resulting in cost savings of over $400,000. Patterns of resistance pre- and post- ASP implementation reflect decreasing bacterial resistance trends.

DISCUSSION

The implementation of core strategies recommended by IDSA and SHEA guidelines, such as prospective review and feedback (bug-drug mismatch, de-escalation, and formulary restriction and preauthorization reviews) have clearly increased the number of pharmacist reported interventions. Other strategies that likely had an impact on the number of reported antimicrobial interventions include the implementation of pharmacy-led IV to PO conversion and renal dosing protocols. The cost savings of the first year may not be sustained during the upcoming years of ASP, but it agrees with previously published data on first-year ASP cost savings. Results on bacterial resistance trends are clearly showing a downward spiral for many multidrug resistant organisms.

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