Impact of Initiating an Antimicrobial Stewardship Program in a Community Hospital

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Background: Antimicrobial stewardship programs (ASPs) have shown to reduce the utilization of inappropriate antimicrobials, help prevent emergence of resistance and reduce drug acquisition costs. However even though there is an abundance of data regarding implementation and impact of such programs in tertiary academic medical centers, the lack of resources make it difficult to implement ASPs in smaller community hospitals. Lack of trained Pharm.D., ID expertise availability, perceived lack of physician autonomy and overall cost make launching such programs challenging. Therefore the data regarding antimicrobial stewardship programs in the community setting is limited and barriers to implement and maintain such programs still exist. We implemented an antimicrobial stewardship program based on the strategy of prospective audit with intervention and feedback at a 350 bed community hospital in Winfield. In April 2012 a program targeting on community floors was launched at the hospital in early 2011 with the help of ID Physicians and staff/clinical pharmacist. More than 500 interventions were made in a 18-month period mostly resulting in discontinuation and de-escalation of antibiotics. This led to the launch of a full time ASP program with an ID Pharm.D in January, 2012. The purpose of this study is to evaluate the impact of the ASP on the antimicrobial prescribing and utilization at the hospital from January 2012 to June 2015.

Methods:
• 350 bed Community hospital in Winfield, IL (30 mile s west of Chicago, IL )
• ASP team (ID Physicians, ID Pharm.D.)
• Prospective audit of all patients who are on active antimicrobials by ID Pharm.D.
• Daily rounds with ID to review recommendations.
• Physicians called with interventions and recommendations.
• Recommendations tracked in EPIC as I-VENTS starting October 2013.

Data Collected:
• Number of charts reviewed, recommendations made and accepted.
• Yearly antibiotic acquisition cost from Pharmacy purchasing data.
• Antibiotic utilization: Days of Therapy (DOT)/1000 patient days at risk (DAR) data from BD-CareFusion MedMined® services.
• Impact of Procalcitonin assay on average length of stay (ALOS), mortality rate, 30 Day Re-admission rate: FCT was added to PNA order set in March 2014.

Additional ASP efforts
• Antibiotic Subcommittee started (representatives from Infection prevention, microbiology lab, Pediatric ID MS, Pharmacy management, EPIC team) for formulary additions, protocols and guideline changes.
• Created an Infection Disease Pathway in EPIC for MD antibiotic order entry.
• Antibiotic Order set reviews, Pneumonia task force, Sepsis Steering committee.
• Physicians, Pharmacy, Nursing staff education.

Data Analysis:
• Stacked bar charts, line charts, proportion charts and tables are produced in Excel with the use of SPC Statistical Process Control software.

Results:

Impact of Procalcitonin lab assay

All patients with a principal ICD diagnosis of pneumonia, ages 18 years

Yearly Antimicrobial Cost/1000 patient day

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Discussion & Conclusions
• Formal ASP was successfully implemented in a 350 bed Community hospital in Winfield, IL Monday thru Friday.
• Program has a high rate of physician acceptance (98%) and management support.
• Analysis of 50 charts reviewed per day.
• Approximately 8000 interventions made in 3 year period.
• 29% reduction in inappropriate use and antimicrobial cost compared to historical.
• Rates of antimicrobial utilization have been maintained well below national average for comparable hospitals (teaching and non-teaching).
• Analysis of patients admitted for pneumonia before and after systematic antibiotic therapy testing showed that the average length of stay decreased from 4.72 to 4.25 days and mortality rate decreased from 3.30% to 1.71%.
• 30-day readmissions decreased from 13.36% in 2013 to 12.2% in 2014. However the rate went up to 13.7% in 2015. Further analysis is ongoing.
• Efforts underway to implement rapid diagnostic testing for MRSA, Candida and Gram negative organisms using the MALDI-TOF system.
• Prospective audit with feedback, electronic physician order sets, formulary restrictions, and pharmacy protocols have led to decreased inappropriate use of antimicrobials in the hospital.

Limitations:
• CPOE EPIC software was launched in September, 2011 and pharmacy supplier changed in 2013 making baseline data collection difficult.
• Pharmacy cost include inpatient and outpatient infusion clinic using.

Acknowledgements:
Inshan Khan PharmD
Bhavna Jain PharmD
Pharmacy Program Manager, Clinical Quality
Salle Jo Rivera, APN, FNP-BC, MSN, CIC
Autumn Langford, Vikas Gupta Pharm.D, BCPS (BD-CareFusion MedMined® services)

Disclosures
No author of this study has any financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

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