Impact of an Antimicrobial Stewardship Intervention in India: Evaluation of Post Prescription Review and Feedback as a Method of Promoting Optimal Antimicrobial Use

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Introduction

- Antimicrobial stewardship programs (AMSP) are effective in developed countries. This study assessed the effectiveness of AMSP in a low-middle-income country like India.

Methodology

- An Infectious Diseases (ID) physician-driven prospective audit and feedback strategy to evaluate the effectiveness of AMSP in two intensive care settings of a tertiary care hospital was performed from January 2016 to July 2017 in 3 phases: baseline, intervention and follow up each consisting of 6 months.
- Primary outcome: Days on antimicrobial therapy (DOT).
- Secondary outcomes included proportion of prescriptions with inappropriate choice of antibiotic use.
- Process measures included rates of de-escalation according to culture susceptibility and clinical evaluation; intervention rate (defined as the number of courses of therapy in which a modification is recommended divided by the total number of courses) and acceptance rate (calculated as the number of recommendations accepted divided by the number of recommendations made).
- In the intervention phase a patient on antibiotics for >48 hours was assessed by an ID physician and recommendations made.
- The recommendations were discussed with both the ICU and treating teams with individual alerts sent to the entire team as reminders.

In the baseline and follow up period relevant data were recorded.

A total of 401, 381 and 379 patients were recruited in the baseline, intervention and follow up phases. Baseline characteristics of the 3 groups were similar.

- Antimicrobial use decreased from 831.5 during baseline to 717 DOT per 100 patient days in the intervention (p-value<0.0001) and the effect was sustained in the follow-up period (713.6 DOT per 1000 patient days).
- Compliance to hospital-based antibiotic guidelines significantly improved in intervention and follow up phases compared to the baseline (19.5%, 21.8%, 33.2%; p<0.0001).
- Among the study antimicrobials, DOs were significantly lower in the intervention vs. baseline phase for Quinolones (21.5vs.33.3%) Carbenemers (340.2 vs.426.0) and Colistin (131.5vs.155.9) (p<0.0001).
- De-escalation according to culture susceptibility was significantly higher in the intervention group compared to the baseline (42.7% vs. 23.6%; p<0.0001).
- We found that 70.3% of antibiotic prescriptions were inappropriate and commonly occurred in the absence of an appropriate clinical indication.
- Recommendations by the ID team were accepted in 60.7% of the cases.
- All-cause hospital mortality rates were 22.4% and 27.6% in the baseline and intervention phases respectively (p=0.093).

Results

Figure 1. Prevalence of Multidrug Resistant Organism

Figure 2. Days of therapy/1000 Patient Days

Figure 3. Acceptance of recommendation given by the ID physician during Intervention phase

Table 1. Baseline characteristics of patients enrolled under Baseline, Intervention and Follow up Phases

Table 2. Review of Antibiotic therapy by the ID Team at Day 3

Table 3. Secondary Outcomes at Discharge

Conclusion

- ID physician-driven antimicrobial stewardship program was successful in reducing antibiotic utilization without compromising patient safety in low and middle-income countries; however this needs further validation.

Acknowledgments

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Reference