Evaluating the impact of mandatory indications on antibiotic utilization: a retrospective study

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Abstract

Introduction

• Mandatory indications for antimicrobial agents are recommended by a number of organizations1-2 to act as a force function, requiring prescribers to provide a reason for prescribing at the time of order entry.

• Meeker et al3 demonstrated that electronic order sets, including a prompt requesting a non-mandatory justification for prescribed antibiotics, resulted in lower rates of inappropriate prescribing for outpatients with acute upper respiratory tract infections.

• There are no studies investigating the effects of mandatory indication fields in the inpatient setting.

• We evaluated the impact of introducing a mandatory indication field into electronic order entry for selected antibiotics on utilization of antibiotics at a large community hospital in the context of an established antimicrobial stewardship program.

Methods

• Inclusion: Adult patients 18 years and above with orders for either

  Study antibiotics (Have mandatory indications)
  Intravenous and enteral clindamycin, ciprofloxacin, metronidazole, moxifloxacin and vancomycin

  Control antibiotics (No mandatory indications)
  Enteral amoxicillin/clavulanate and intravenous piperacillin/tazobactam

• Pre-intervention period: April 1 - September 30, 2015

• Phase-in period: October 1 – November 30, 2015

• Post-intervention period: December 1, 2015- November 30, 2016

• Primary outcome: antibiotic use measured in Days of Therapy (DOT) per 1000 patient-days (PD) for study and control antibiotics 1-6 months prior compared to 1-12 months after the intervention, both individually and as a group

• An independent t-test was used to measure the primary outcome

• A descriptive analysis of the mandatory indication fields for the study antibiotics

Results and Discussion

• A total of 8399 orders were evaluated in the one-year post-implementation period, of which 4572 were for study antibiotics.

• The preset mandatory indications were selected 30-55% of the time, depending on antibiotic prescribed

• For the primary outcome, there was a statistically significant decrease in DOT/1000 patient-days for study antibiotics as a group pre- and post-intervention (mean 100 versus 82 p=0.024) as but not individually.

• There was a statistically significant increase in DOT/1000 patient-days for the control antibiotics (mean 78 vs 91, p=0.01), driven by the increase in piperacillin/tazobactam utilization.

• Limitations:
  • Risk of study unmeasured confounders with study design, and retrospective analysis
  • No audit of appropriateness of mandatory indication selected
  • No DOT data for 12 months prior to intervention

Conclusions

• This study showed moderate use of preset mandatory indications which suggests that the preset list of indications can be optimized.

• Mandatory indications were shown to be associated with a reduction in study antibiotics utilization but may lead to shifts in usage to other non-study antibiotics.

Selected References


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A descriptive analysis of the mandatory indication fields for the study antibiotics

Mean DOT/1000 patient days

Study antibiotics: 100.72
Control antibiotics: 82.52

Mean DOT/1000 patient days

Study antibiotics: 78.54
Control antibiotics: 91.13

Implementation date: October 2015

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