Comparison of Active versus Passive Strategies in Improving Compliance to Antimicrobial Stewardship Interventions

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ABSTRACT

Introduction: In Singapore General Hospital, use of the Computerized Decision Support System (CDSS) is mandatory when antibiotics audited by the hospital antimicrobial stewardship program (ASP) team are prescribed. It was envisaged that CDSS could, in part, replace need for ASP review via prospective audit-feedback (PAF). However, quality of CDSS use is prescriber-dependent, and inappropriate use (diagnosis selected is incongruent with antibiotic indication specified in patient notes) was observed. We investigated the role of prescriber enablement and engagement as strategies to improve CDSS appropriateness rates (CAR).

Method: A series of interventions was rolled-out in January 2018. Intervention 1 (I1) was implemented hospital-wide: expanded repertoire of antibiotic guidelines, display of CDSS selected diagnosis on the hospital’s electronic medical record, education and publicity via mass emails. Intervention 2 (I2) involved conducting additional roadshows but only in selected clinical departments (1 major medical and 2 major surgical departments). CAR (prospectively evaluated by ASP team) 3-months pre- and post-implementation of these interventions were compared using interrupted time-series analysis. Its potential impact on ASP manpower in place of PAF (30mins/case) was estimated.

Results: An average of 1041 antibiotic courses, piperacillin-tazobactam (75.7%) as the most common, was prescribed with CDSS per month. Unspecified sepsis (51.5%) was the most common indication. Departments with I1 alone had mediocre improvement in CAR (66.8% [n=1699] vs. 68.9% [n=1760], p=0.10), while departments that received a combination of I1 and I2 saw greater improvement in CAR, with a trend towards statistical significance (60.4% [n=354] vs. 68.3% [n=393], p=0.07). This absolute increment in CAR meant manpower savings of 6.5 hours/month, and could potentially reach 41 hours/month had both interventions been implemented and similar results achieved hospital-wide.

Conclusions: Active prescriber engagement is pivotal in effectively obtaining buy-in and success of ASP strategies.

INTRODUCTION

- The computerized decision support system (CDSS) was designed to increase appropriateness of antibiotic use by encouraging compliance to hospital antibiotic treatment guidelines at the point of prescribing.
- Recommendation offered by CDSS depends solely on the specific condition selected by the prescriber, and is thus vulnerable to inappropriate use: selected diagnosis is incongruent with that specified in patient notes.
- A focus group study identified lack of familiarity with CDSS as a major barrier.
- We investigated the impact of prescriber enablement and engagement on CDSS appropriateness rates (CAR).

METHOD

- Study site: Singapore General Hospital, a 1700-bed acute tertiary care hospital in Singapore.
- Intervention:
  - Intervention 1 (I1): expand list of treatment guidelines, display of CDSS selected diagnosis on electronic health record, hospital-wide publicity and mass email
  - Intervention 2 (I2): 30-minute face to face engagement with prescribers in selected departments (Renal, Hepatobiliary and General Surgery).
- Outcomes:
  - CAR as assessed by the hospital’s antimicrobial stewardship program (ASP) team
  - ASP manpower savings (estimated 30mins/case)

RESULTS

- A total of 7289 courses of IV piperacillin-tazobactam, ertapenem, meropenem, ciprofloxacin and levofloxacin were prescribed via CDSS during the study period.
- Unspecified sepsis was the most common indication for antibiotic use; piperacillin-tazobactam was most frequently prescribed.

![Table 1. Time series analysis of CDSS appropriateness rates](chart)

- Departments that received a combination of I1 and I2 saw greater improvement in CDSS appropriateness rates [60.4% (n=354) vs. 68.3% (n=393), p=0.07].
- Departments with I1 alone had only mediocre improvement in CDSS appropriateness rates [66.8% (n=1699) vs. 68.9% (n=1760), p=0.10].

CONCLUSION

Active prescriber engagement is key to effective buy-in and success of ASP strategies.