INTRODUCTION

The aim of antimicrobial stewardship are to achieve the best clinical outcomes related to antimicrobial use while minimizing emergence of antimicrobial-resistant organisms.

Overuse of carbapenems is associated with the emergence of multi-drug resistant organisms including carbapenem-resistant enterobacteria.

In response, an infectious disease consultation service along with post-prescription prospective audit and feedback were instituted at a Japanese tertiary care center to determine its effects in regulating carbapenem administration.

METHODS

Study Design & Setting

A before-after study at Tokyo Metropolitan Tama General Medical Center (TMTGMC), 790-bed tertiary care medical center in Tokyo, Japan. From April, 2012 through March, 2015.

In the pre-intervention period, the study institution had neither an infectious disease consultation service nor a structural antimicrobial stewardship program.

Interventions:

- Intervention1: Institution of infectious disease (ID) consultation service since July 2013.
  - The ID consultation team consisted of an ABIM-ID-certified attending physician, an ID fellow, and rotating residents.
  - The ID consultation team saw patients prior to making recommendations and followed them until the final recommendations were made.
  - All patients who were initially seen by an ID fellow or rotating residents were supervised by an ID attending physician.
  - ID consultation was conducted at the discretion of primary care team.

- Intervention2: An once-weekly, post-prescription prospective carbapenem audit & feedback from April 2014
  - Patients who are treated with carbapenem antimicrobials for more than 72 hours was initiated.
  - The carbapenem audit team consisted of ID consultation team and a pharmacist, an infection control nurse, and a microbiology laboratory technician.
  - Carbapenem use was considered to be appropriate for any of the following reasons: treatment for febrile neutropenia, treatment for infections susceptible only to carbapenem antibiotics, or infections for which carbapenem was conventionally considered to be a first-line agent.
  - Cases considered to be unsuitable for treatment using carbapenem were investigated by a pharmacist, and feedback including recommendations for its discontinuation or replacement with other agents was given to primary care providers.

RESULTS

Trends in monthly carbapenem use

Among those 186 episodes, 80 episodes (43.0%) were considered to be instances of inappropriate use.

Carbapenem use or streamlining to other antimicrobials, were accepted in 63/80 (78.8%) of instances.

Carbapenem use in patients with febrile neutropenia or those with infections susceptible only to carbapenem antibacterials was considered appropriate.

Cases considered to be inappropriate for carbapenem use were investigated by a pharmacist and feedback including recommendations for its discontinuation or replacement with other agents were given to primary care providers.

Variables of Interest and Data Collection:

- The monthly carbapenem use was measured and standardized as a day of therapy (DOT) per 1,000 patient-days.

- Changes in the absolute level of carbapenem use over a period longer than 72 hours in 186 cumulative patients were identified.

- With an once-weekly carbapenem audit, we were able to investigate 186 episodes of carbapenem use (73.5%) in 123 cumulative patients.

- Among those 186 episodes, 80 episodes (43.0%) were considered to be instances of inappropriate use.

- Feedback and recommendations pertaining to such cases from the antimicrobial stewardship team, including the termination of carbapenem use or streamlining to other antimicrobials, were accepted in 63/80 (78.8%) of instances.

NOTE

- This study demonstrated that overall carbapenem use was successfully reduced with the institution of ID consultation and a post-prescription prospective carbapenem audit without changing in-hospital mortality or length of hospitalization.

- ID consultation service functioned as an effective clinical ‘arbiter’ in determining the appropriateness of prescribing antimicrobial agents, and led to a decrease in carbapenem use. ID consultation provides objective benchmarks for antimicrobial use to counter psychosocial influences on the primary service’s prescribing practices.

- Carbapenem antimicrobial use further decreased with implementation of post-prescription prospective audit and feedback. Audit and feedback remain an important concept to regulate carbapenem administration although this reduction did not achieve statistical significance in the interrupted time series analysis.

- Antimicrobial stewardship should be implemented regardless of the size or nationality of the hospital, given the global scale of this issue.

Figure 1. Monthly average carbapenem antimicrobials use before and after institution of infectious disease consultation and post-prescription carbapenem audit and feedback.

CONCLUSION

Impact of infectious disease consultation and prospective carbapenem use as an antimicrobial stewardship for carbapenem use at a Japanese tertiary care center: An interrupted time series analysis

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Example of abstract from the presented paper:

"The aim of antimicrobial stewardship are to achieve the best clinical outcomes related to antimicrobial use while minimizing emergence of antimicrobial-resistant organisms. Overuse of carbapenems is associated with the emergence of multi-drug resistant organisms including carbapenem-resistant enterobacteria. In response, an infectious disease consultation service along with post-prescription prospective audit and feedback were instituted at a Japanese tertiary care center to determine its effects in regulating carbapenem administration. Methods: A before-after study was conducted from April, 2012 through March, 2015 at Tokyo Metropolitan Tama General Medical Center, a 790-bed, tertiary care medical center in Tokyo, Japan. Infectious disease consultation service (intervention1) was initiated in July, 2013 and an once-weekly prospective audits and feedback on carbapenem antimicrobial use (intervention2) were conducted from April, 2014. Carbapenem use in patients with febrile neutropenia or those with infections susceptible only to carbapenem antibacterials was considered appropriate. Cases considered to be inappropriate for carbapenem use were investigated by a pharmacist and feedback including recommendations for its discontinuation or replacement with other agents were given to primary care providers. An interrupted time series analysis was performed to assess the impact of the infectious disease consultation and prospective audit on carbapenem use. Results: After implementation of the infectious disease consultation and carbapenem audit, monthly carbapenem use decreased from 21.2 days of therapy (DOT) per 1,000 patient-days in the pre-intervention period to 8.36 DOT per 1,000 patient-days in the subsequent post-intervention periods (proportional reduction 0.48; 95% confidence interval 0.46 to 0.50) with no change in in-hospital mortality. The time series modeling revealed an immediate decrease in carbapenem use due to infectious disease consultation (P=0.01 for intercept), but not due to carbapenem audit and feedback (P=0.98 for intercept and P=0.15 for trend). Conclusions: A multifaceted intervention including infectious disease consultation and carbapenem audit appear to be safe and effective in reducing overall carbapenem use."

Example of methods from the presented paper:

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