Impact of an Innovative “App” on Intensive Care Unit (ICU) Antimicrobial Utilization Across a Large Metropolitan Health Region in Canada: an Interrupted Time Series Analysis

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BACKGROUND

With rising rates of antimicrobial resistance, innovative stewardship interventions that impact prescribing behavior are critical. Spectrum is a customizable smartphone app that offers algorithmic clinical decision support based on clinical guidelines and local microbiology data. The app was introduced to all ICU prescribers across a large metropolitan health region (population 1.4 million). We conducted an uncontrolled before-after ITS analysis to evaluate the impact on ICU antimicrobial utilization (AMU) after introduction of the app.

METHODS

Spectrum was launched to ICU staff and trainees in Calgary, Alberta through monthly educational sessions starting 1/1/2013. Penetration of the app was tracked with Flurry Analytics®, a post-intervention survey, and documentation of session attendance. Patient demographics as well as central line associated bloodstream infection (CLABSI) and influenza rates were analyzed for both time periods. An ITS analysis was performed to compare AMU in the 12 months before and after app introduction (allowing a three month wash-in period) using daily defined dose/100 patient days. Statistical analysis was done using student’s t test for continuous variables and two-tailed de defined doses/100 patient days. Statistical analysis was done using student’s t test for continuous variables and two-tailed analysis to evaluate the impact on ICU antimicrobial utilization (AMU). The trend toward decreased anti-psuedomonal prescribing behavior are critical. Spectrum is a customizable smartphone app that offers algorithmic clinical decision support based on clinical guidelines and local microbiology data. The app was introduced to all ICU prescribers across a large metropolitan health region (population 1.4 million). We conducted an uncontrolled before-after ITS analysis to evaluate the impact on ICU antimicrobial utilization (AMU) after introduction of the app.

RESULTS

Patient characteristics were similar between the intervention groups, including age (p=0.1502), admission APACHE (p=0.7784), and immnosuppression (p=0.2685), as were rates of CLABSI and influenza. At the end of the wash-in period there were 634 active Spectrum users, which increased to 1145 during the post-intervention period (Fig 1, 2). Moreover, 76.1% of survey respondents reported using Spectrum during this time. There was no statistically significant change in overall AMU between the time periods. Agent-specific analysis revealed a trend toward decreased anti-pseudomonal utilization (p=0.07) (Fig 3). Qualitatively, 70.4% of respondents agreed this app changed their antimicrobial prescribing practice while 89.1% would recommend it to colleagues (Fig 4).

DISCUSSION

Spectrum was an easily implemented, widely accepted intervention that yielded positive user feedback. Though there was no significant reduction in overall AMU, the trend toward decreased anti-pseudomonal use may represent more appropriate antimicrobial prescribing within an ICU setting. Further longitudinal analysis is required to assess the impact of this promising app on antimicrobial utilization.

AWARD

Recipient of the Accreditation Canada Canada Health Infoway LEADing Practice Award for 2016

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