

ABSTRACT

Clinical decision support at the time of an e-prescription can sustainably decrease unwarranted use of antibiotics for acute respiratory infections

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Introduction

Microorganisms resistant to antibiotics (ABX) increase the mortality, morbidity and costs of infections. In the absence of a drug development pipeline that can keep pace with the emerging resistance mechanisms, these organisms are expected to threaten public health for years to come. Because exposure to ABX promotes the development of bacterial resistance, health care providers have long been urged to avoid using antibiotics to treat conditions that they are unlikely to improve, including many uncomplicated acute respiratory infections (ARI). We asked if interposing clinical decision support (CDS) software at the time of electronic order entry could adjust ABX utilization toward consensus guidelines for these conditions.¹

Methods

The CDS was programmed in-house and introduced on January 2003 at the Maryland VA site (Intervention) but not at the Utah VA site (control). The CDS targeted two ABX, gatifloxacin and azithromycin (targeted ABX). Access to all other ABX was unrestricted (other ABX). To derive an enriched, population-based sample, we applied a previously validated² ARI surveillance algorithm ((one of 197 'respiratory' ICD-9 diagnostic code or new cough remedies or temp \geq 38 °C) and (text analysis of the clinical note for non-negated ARI symptoms)) to EMR entries surrounding all outpatient visits (n = 4.1 million) during our study period (January 2002–December 2006). Flagged records (n = 7000) were then manually abstracted on the day of each index visit for all information required to establish guideline-defined ARI diagnoses and ABX treatment.

Results

A total of 3831 unique patients satisfied the consensus case definitions for pneumonias (537), bronchitis (2931), sinusitis

(717) and non-specific acute respiratory infections (145). For the two targeted ABX, the proportion of unwarranted prescriptions for ARI decreased from 22 to 3%, pre- (2002) vs post-intervention period (2003–2006, P<0.0001). This proportion did not change for the other ABX at the intervention site (30 pre vs 31% post) or for both the targeted (16 vs 20%) and the other ABX (22 vs 27%) at the control site



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(Figure, upper panel). The CDS did not impede utilization of antibiotics when they were indicated (middle panel), including all cases with pneumonia. Azithromycin and gatifloxacin remained the predominant antibiotics prescribed when indicated for ARI (68-70% of all ABX at both sites, pre and post, lower panel).

Conclusion

CDS interposed during the e-prescription process nearly extinguished unwarranted use of targeted ABX for the treatment of ARI for 4 years, and did so without reducing indicated use or shunting misutilization toward unrestricted agents. If deployed at the appropriate scale, this approach could exert a positive impact on public health.

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References

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