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Research paper

A survey of the antibiotic prescribing practices of doctors in an Australian Emergency Department

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KEYWORDS

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Abstract *Background:* Appropriate antibiotic prescribing is important for good patient care and reducing the development of resistance. There has been limited research into doctors' prescribing practices. The aim of this study is to evaluate antibiotic prescribing practices in an Australian emergency department compared with the Therapeutic Guidelines.

Methods: A case vignette survey was sent to emergency department doctors at The Townsville Hospital between February and May 2016. Antibiotic choices were assessed for appropriateness using the National Antimicrobial Prescribing Survey guidelines. Factors associated with antibiotic choice were assessed according to case, clinician experience and rationale. Data was analysed using a non-parametric Kruskal–Wallis test. Post-hoc analysis of variance was performed using Dunn test with Bonferroni correction for multiple simultaneous comparisons, with $p < 0.05$ considered significant.

Results: 197 of 274 antibiotic choices (72%) were appropriate with 149 (54%) optimal. Antibiotic choice was more likely to be appropriate for a urinary tract infection (UTI) compared with severe pyelonephritis ($p < 0.01$), severe cellulitis ($p < 0.01$), moderate community-acquired pneumonia (CAP) ($p < 0.01$) and sepsis ($p < 0.01$), and was more likely to be appropriate for cellulitis than CAP ($p = 0.03$) and sepsis ($p = 0.02$). Antibiotic choices were more likely to be appropriate when doctors reported basing antibiotic choice on the Therapeutic Guidelines compared with current hospital practice ($p = 0.02$). No significant difference was found in antibiotic appropriateness in relation to grade of doctor ($p = 0.34$).

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Conclusion: This study demonstrates generally poor antibiotic prescribing compliance with the Therapeutic Guidelines across all grades of clinician. Antibiotic prescribing was more likely to be appropriate if based on the Therapeutic Guidelines and in less severe infection.

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Highlights

- Compliance with the Therapeutic Guidelines is generally poor.
- Antibiotic prescribing is more likely to be appropriate in cases of less systemically unwell patients.
- Grade of doctor is not associated with guideline compliance.

Introduction

Appropriate antibiotic prescribing is essential for optimising patient outcomes in infectious diseases, with evidence showing that inappropriate or inadequate empirical antibiotic treatment is associated with increased morbidity, mortality and length of hospital stay [1]. In addition, appropriate antibiotic prescribing has an important role in slowing the development of antimicrobial resistance which has been shown to be a growing problem. Antimicrobial resistance is estimated to account for 700,000 deaths annually globally and is projected to reach 10 million by 2050 [2]. It is also associated with increased severity of infection, increased length of hospital stay, increased morbidity and a high economic burden [3]. Any use of antimicrobials, but in particular inappropriate use, contributes to the development of antimicrobial resistance, therefore optimising the use of antimicrobials is key in tackling antimicrobial resistance [4].

In order to optimise our antimicrobial use, we first need to assess our prescribing practice. The 2015 Hospital National Antimicrobial Prescribing Survey analysed over 20,000 prescriptions from 281 hospitals across Australia and found that 77% of prescriptions were appropriate, with 70% complying with the Therapeutic Guidelines [5]. Limited evidence from Australia and abroad has found varying compliance with antibiotic prescribing guidelines, ranging from 18% to 83% compliance [6–11]. None of these studies, however, explored factors affecting antibiotic prescribing or the rationale behind the choices made. This is the first study of its kind in a tertiary level hospital that assesses antibiotic prescribing within an emergency department using a case vignette study. The objectives of this study were to assess empirical antibiotic prescribing compliance with the Therapeutic Guidelines [12], and to explore factors which were associated with the clinician's antibiotic choices.

Primary aim:

- To compare antibiotic prescribing practices of doctors in an Australian emergency department with the Therapeutic Guidelines

Secondary aims:

- To explore factors that influence antibiotic prescribing

- To compare prescribing practices amongst different grades of doctor

Methods

Participants

All doctors working in The Townsville Hospital Emergency Department were invited to complete an online questionnaire. This excluded the authors of this paper.

Dissemination

Invitations to complete the questionnaires were distributed to participants by email and these were completed between February and May 2016. The questionnaires were created and responses collected using the online tool SurveyMonkey®.

Questionnaire

The questionnaire comprised five clinical cases – uncomplicated urinary tract infection (UTI), severe pyelonephritis, severe cellulitis, moderate community-acquired pneumonia (CAP), sepsis of unknown origin (Appendix 1). These case vignettes were developed by the authors to represent a range of bacterial infections commonly managed in the emergency department. For each case, participants were asked to choose one or more appropriate antibiotics from a given list that included all available antibiotics, and were required to identify their primary influence for this choice. Respondents were encouraged to access resources as they would normally when managing patients. Specific demographic information was collected which the authors felt may influence prescribing practice – the year of qualification, number of years practising as a doctor, number of years practising at Townsville Hospital and grade of clinician (Appendix 2). All responses were anonymous.

Antibiotic prescribing choices were compared with those recommended by the Therapeutic Guidelines. Specific guidelines used were as follows: Case 1 (uncomplicated UTI) – uncomplicated cystitis; Case 2 (pyelonephritis) – severe pyelonephritis; Case 3 (cellulitis) – severe cellulitis; Case 4 (CAP) – moderate community-acquired pneumonia;

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