

A Survey of the Antibiotic Prescribing Practices of Doctors in an Australian Emergency Department

M Clemence,¹ A Henderson,² C Greenbury,³ A Norton,² J Furyk³

¹ Internal Medicine Department ² Microbiology Department ³ Emergency Department, The Townsville Hospital, QLD, Australia

Background

Appropriate antibiotic prescribing is essential, not only for optimising patient care, but also for slowing the development of antibiotic resistance. While there is a significant body of research into antibiotic efficacy and resistance, there has been little exploration into doctors' prescribing practices and the rationale behind antibiotic choices made by front line prescribers. This is the first study of its kind set in a tertiary level hospital that assesses antibiotic prescribing within an emergency department using a case vignette study.

Primary Aim:

- To compare antibiotic prescribing practices of doctors in an Australian emergency department with the Therapeutic Guidelines¹

Secondary aims:

- To explore factors that influence antibiotic prescribing
- To compare prescribing practices between different grades of doctors

Method

All doctors working in The Townsville Hospital Emergency Department were invited to complete an online survey, between February and May 2016, which comprised five case vignettes of commonly encountered pathologies in the emergency department:

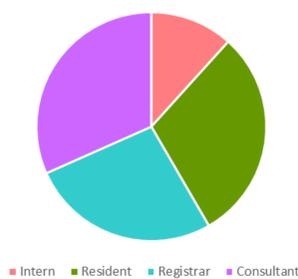
- Uncomplicated Urinary Tract Infection (UTI)
- Severe Pyelonephritis
- Severe Cellulitis
- Moderate Community Acquired Pneumonia (CAP)
- Sepsis of Unknown Origin

Responders selected antibiotic management from a given list of antibiotics and choices were compared with the recommendations from the Therapeutic Guidelines. Appropriateness was rated according to the National Antimicrobial Prescribing Guidelines.² Demographic data was also collected and the responders answered questions regarding what influenced their antibiotic choice.

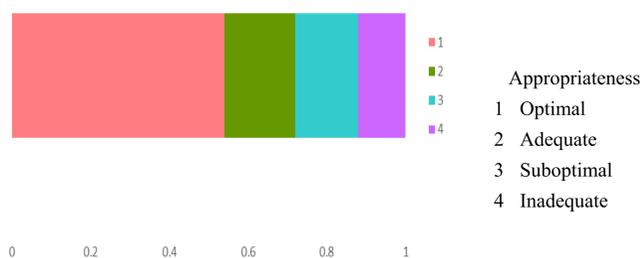
Data was analysed using a non-parametric Kruskal-Wallis test. Post-hoc analysis of variance was performed using Dunn test with Bonferroni correction for multiple simultaneous comparisons, with $p < 0.05$ considered significant.

Results

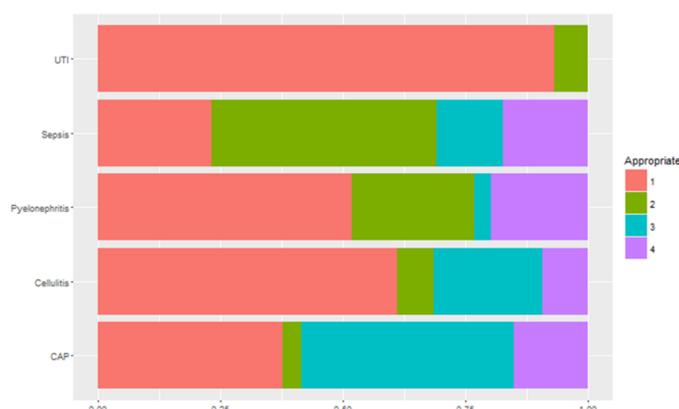
Participants by grade of doctor (Total number 60)



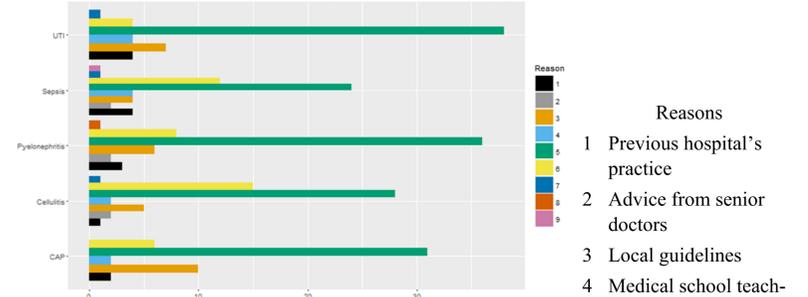
Appropriateness of antibiotic choices across all cases



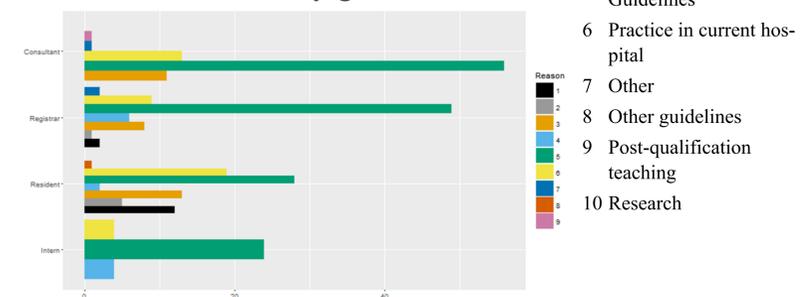
Percentage of appropriate antibiotic choices according to infection type



Reason for antibiotic choice by infection type



Reason for antibiotic choice by grade of doctor



- No statistically significant difference was found in appropriateness of antibiotic choice in relation to grade of doctor ($p=0.34$)
- A significant difference was found when antibiotic choice was assessed in relation to infection type ($p < 0.01$)
 - Antibiotic choice was more likely to be appropriate for UTI compared to pyelonephritis ($p < 0.01$), cellulitis ($p < 0.01$), CAP ($p < 0.01$) and sepsis ($p < 0.01$)
 - Antibiotic choice was more likely to be appropriate for cellulitis when compared to CAP ($p=0.03$) and sepsis ($p=0.02$)
- Antibiotic choice more likely to be appropriate when doctors reported choosing antibiotics based on the Therapeutic Guidelines as opposed to practice in their current hospital ($p=0.02$)

Discussion

Antibiotic prescribing was poorly compliant with the Therapeutic Guidelines across all but one case vignettes, regardless of the grade of doctor. Antibiotic choice was most likely to be appropriate in cases of less systemically unwell patients - a statistically significant difference was found in antibiotics prescribed for UTI when compared to sepsis, pyelonephritis, cellulitis and CAP. Similarly, antibiotic choice for cellulitis was more likely to be appropriate when compared to sepsis and CAP. This was surprising as one would expect clinicians to be more assiduous in following the Therapeutic Guidelines when dealing with the more unwell patient. We found a correlation between the proportion of doctors citing the Therapeutic Guidelines as the main influence on their antibiotic choice and the proportion of choices which were compliant.

The main limitation of this study was that it was single-centred with a relatively small number of participants. This study did not cover variables such as dosing, duration of treatment and drug allergy, and it is likely that with this additional complexity antibiotic choice would be even less appropriate.

There is scope to conduct a similar case vignette-based survey as a multi-centre study exploring additional aspects of antibiotic practice such as the above mentioned variables, and broadened to include the use of antivirals and antifungals. A study of this type need not be confined to the emergency department, and could also be conducted across different specialties.

Conclusion

- Antibiotic prescribing was poorly compliant with the Therapeutic Guidelines across all grades of doctor and antibiotic choice was less likely to be appropriate in more severe cases
- This high rate of inappropriate antibiotic prescribing has significant implications for patient care and supports the role of antimicrobial stewardship in emergency departments
- There is scope to expand this study, examining different variables (anti-microbial medications, dosing, treatment duration) in different clinical settings

Acknowledgements

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References

- Therapeutic Guidelines Limited. Therapeutic guidelines: antibiotic. Version 15, 2014. <https://www.tg.org.au> (accessed January 2016).
- Australian Commission on Safety and quality in Healthcare 2015. *Antimicrobial prescribing practice in Australian Hospitals: results of the 2014 National Antimicrobial Prescribing Survey*, ACSQHC, Sydney.