

Evaluation Of Antimicrobial Management Of Community-acquired Pneumonia In Respiratory Patients In A Metropolitan Hospital

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Introduction

- Pneumonia remains one of the most significant causes of morbidity and mortality. Community-acquired pneumonia (CAP) is the second most common indication for prescribing of antimicrobials in hospitals and places a considerable burden on the Australian healthcare system.
- Worldwide analyses demonstrated that adherence to CAP guidelines reduces inappropriate antimicrobial prescribing and improves patients' outcomes. However, despite the introduction of national therapeutic guidelines, non-adherence to guidelines and inappropriate prescribing of antibiotics remain a common issue in many Australian hospitals and globally¹⁻³.

Aim

- To assess adherence of antimicrobial management in respiratory patients with CAP to Therapeutic Guidelines: Antibiotics (TG) and local Clinical Practice Guideline (CPG) introduced in November 2018.

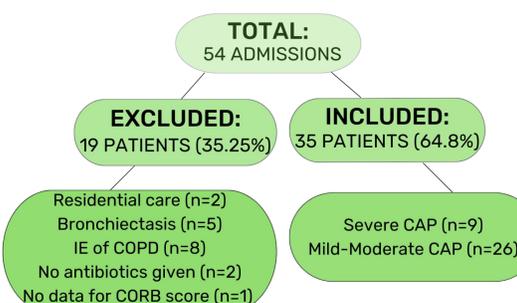
Methods

- A retrospective pilot audit included adult respiratory inpatients with a diagnosis of CAP as per the International Statistical Classification of Disease (ICD) who had received one or more doses of an antibiotic and was assessed over four months (01/12/2018 to 31/03/2019) at Frankston Hospital.
- Exclusion criteria:**
 - Recent hospitalisation (<30 days for immunocompetent or <90 days for immunocompromised patients).
 - Dependent nursing homes/long-term care facilities.
 - Bronchiectasis, Infective exacerbation (IE) of Chronic Obstructive Pulmonary Disease (COPD), Immunocompromised patients.
- List of patients with CAP diagnosis (J10 to J18) from an ICD list was generated from electronic medical records (EMR).
- Data were manually extracted from EMR to obtain antibiotics prescribed and used to calculate pneumonia severity scores.
- Endpoints:**
 - The percentage of CAP patients that were prescribed guideline concordant antimicrobial therapy.
- A standardised pneumonia severity score, CORB (Confusion, Oxygen saturation ($\leq 90\%$), Respiratory rate (≥ 30 breaths) and Blood pressure (SBP < 90 mmHg or DBP ≤ 60 mmHg)) was calculated for each patient to determine the appropriate antibiotic regimen.

	TG: Antibiotics	Local CPG
Moderate CORB ≤ 1	Benzylpenicillin + doxycycline	
	Non-immediate penicillin allergy	Ceftriaxone/Cefotaxime + doxycycline
	Immediate penicillin allergy	Moxifloxacin PO
Severe CORB ≥ 2	Non-immediate penicillin allergy	Ceftriaxone /cefotaxime + azithromycin IV
	Immediate penicillin allergy	Moxifloxacin IV

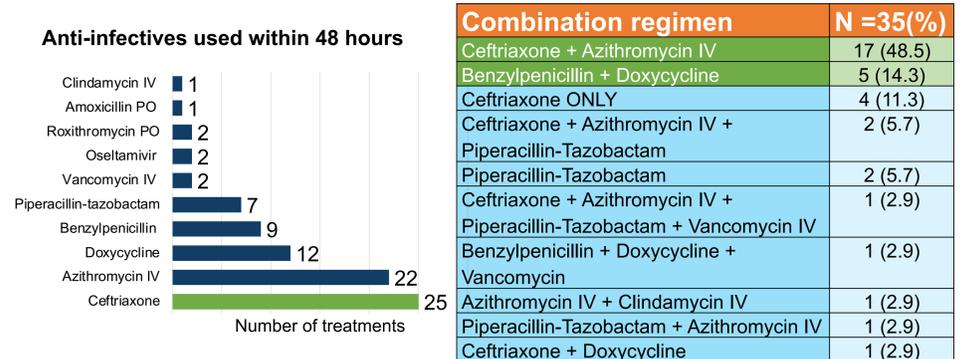
Results

Demographics of eligible patients:



CHARACTERISTIC	VALUE
Mean Age(Range)	60 (30 - 88)
Female, n(%)	16 (45.7%)
Male, n(%)	19 (54.3%)
Immunosuppression, n(%)	6 (17.1%)
Heart Failure, n(%)	3 (8.6%)
Diabetes Mellitus, n(%)	7 (20%)
Asthma, n(%)	10 (28.6%)

Anti-infectives used within 48 hours of admission and combination regimens:



Outcomes

- From descriptive analysis of 35 eligible patients, **31.4%**(n=11) were compliant to TG and local CPG, and **68.6 %**(n=24) were non-compliant.
- Eight (22.9%) antibiotics allergies recorded, with penicillin allergies being the most common (n=5), followed by cephalosporins (n=1), macrolides (n=1) and tetracycline (n=1).
- Of the non-compliant cases(n=24), 62.5%(n=15) were overtreated as severe instead of mild-moderate and 37.5%(n=9) were prescribed inappropriate antibiotic regimens.
- First dose of antibiotic ≤ 4 hours occurred in 28 (80%) of cases.
- IV to oral switch occurred for 82.9% cases (n=29).

Discussion

- Adherence to TG and local CPG for treatment of CAP was suboptimal, with mild-moderate CAP being more likely to be treated as severe and may have resulted in unnecessary broad-spectrum therapies.
- Over 71.4% (n=25) of patients were prescribed ceftriaxone alone or with other antibiotics. Ceftriaxone is recommended for severe CAP or in some cases, penicillin hypersensitivity. The widespread use of this third-generation cephalosporin has been shown to increase adverse effects such as *Clostridium difficile* infections and the development of multidrug-resistant organisms.
- Our audit also revealed that pneumonia severity scores were rarely documented. Only 20% (n=7) of all cases were performed and recorded. Despite pneumonia severity scores improving guideline concordance with empirical antibiotic choice, the number of recordings of this score also remains low in other Australian hospital audits¹⁻³.
- Our retrospective audit was conducted at one site over four months, so results may not be generalisable and may not account for seasonal variation of CAP. Furthermore, we did not explore reasons for admission to the respiratory ward compared to medical wards. Patients admitted under this specialty may have been sicker than others and this may have influenced the prescriber's clinical judgement and antibiotic choice.

Conclusion

- Adherence to antibiotic guidelines for the management of CAP has been shown to reduce the length of hospital stay, decrease healthcare costs and; reduce mortality and morbidity. However, from this audit and numerous other studies, it is apparent that CAP guidelines regarding antibiotic choice has been poorly adhered to.
- Further studies may highlight the need for pharmacy and/or organisational interventions to increase awareness for routine pneumonia severity assessment and treatment as per guidelines.

References

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