



A Service Evaluation of Adherence with Antimicrobial Guidelines in the Treatment of Community Acquired Pneumonia (CAP) before and during the SARS-CoV-2 outbreak

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Background

Appropriate antimicrobial prescribing practices are important in reducing antimicrobial resistance, preventing unnecessary healthcare costs, reducing the burden of intravenous antibiotic administration and, most importantly, ensuring good patient care.

Following the SARS-CoV-2 outbreak, medical patients presenting with features of a respiratory infection were more commonly being reviewed by an infectious disease specialist (IDS) or respiratory specialist, within 24 hours of admission.

Aims

This project aims to assess how this change in service provision, namely the increased frequency of specialist review during the SARS-CoV-2 outbreak, affected antimicrobial stewardship and prescribing practices.

Methods

Patients treated for CAP from the months March-April 2020 were included. Retrospective data collected from electronic patient records included demographics, documentation of CURB-65 score, microbiology/radiology results, and antimicrobial treatment (including whether the antimicrobials initiated were compliant with CURB-65 hospital guidelines, were appropriate in the clinical context, escalation and de-escalation of antimicrobials, and duration of treatment). Data were compared with a similar cohort of patients treated for CAP between November 2019 and January 2020.

Inclusion criteria:

Patients admitted under a medical team with a clinical or radiological diagnosis of CAP; patients treated for presumed CAP before an alternative diagnosis was reached; patients with SARS-CoV-2 that were treated for a suspected superimposed bacterial pneumonia.

Exclusion criteria:

Patients meeting the criteria for hospital- or healthcare-acquired pneumonia; patients with infective exacerbation of COPD without clinical or radiological features of pneumonia.

Results

- 76 patients were included from March-April, with a mean age of 71.9 years and a median admission of nine days.
- 35 patients (46%) were reviewed by an ID or respiratory specialist within 24 hours of admission; of those, 22 were transferred to the care of the ID or respiratory team
- Hospital guidelines recommend that all patients with a CURB-65 score of 2 or more should undergo urinary antigen testing, blood cultures and sputum cultures; only 3/32 patients with a CURB score of 2+ underwent all three
- Of those reviewed by ID/Resp within 24 hours, 49% continued on Abx for an appropriate duration vs 36% of those not reviewed (and only 33% of those in the Nov-Jan study)
- CURB-65 score was documented in 16% of cases, while a SARS-CoV-2 exposure history was documented in 61%

Comparing appropriateness of changes made to antibiotics	Seen by ID/Resp (N = 35)	Not seen by ID/Resp (N = 41)
Appropriate escalation	13/13 (100%)	10/14 (71%)
Appropriate de-escalation	18/18 (100%)	15/22 (68%)
Appropriately left unchanged	3/4 (75%)	3/5 (60%)
Total	34/35 (97%)	28/41 (68%)

Comparing both studies	Mar -April (N=76)	Nov - Jan (N=77)
CURB-65 score documented on admission	12 (15.8%)	14 (18%)
Abx compliant with CURB-65 guidelines	14 (18%)	13 (16.8%)
Abx deemed appropriate in clinical context	57 (75%)	53 (68.8%)
Follow-up CXR booked/done	26 (34%)	26 (33%)

Discussion

Pneumonia is a common infectious cause of morbidity and mortality. It is considered the leading infection causing death in the US¹, with a significant social and economic cost². Non-compliance with prescribing guidelines is associated with longer hospital stays, increased mortality, and higher costs³.

This service evaluation found that adherence to local guidelines was significantly lower than prior studies, both in Ireland and abroad^{2,3}. This was often due to IV administration of drugs that could be given orally, combination therapy, or administration of broad spectrum antibiotics where narrow-spectrum would have been appropriate. In the majority of cases, however, the antibiotic initiated was deemed appropriate in the clinical setting. This may have been based on the clinical presentation, prior sputum sensitivities, recent antimicrobial therapy, suitability of oral administration, or comorbidities.

It is well documented that IDS input reduces the rate of inappropriate prescribing, and has also been associated with shorter admissions and decreased mortality⁴. While initiation of antibiotics typically occurred prior to IDS review in our study, the benefits of IDS input were demonstrated in rates of appropriate escalation, de-escalation and duration of antimicrobial treatment. The impact on length of stay was not assessed due to confounding factors related to SARS-CoV-2.

Conclusions

- Compliance with CURB-65 guidelines was poor, though the choice of antimicrobial was often deemed appropriate in the clinical setting
- Prompt review by an ID/Resp specialist improved the rate of appropriate escalation and de-escalation of antibiotics. Duration of treatment was also more appropriate in this group.
- <10% of patients underwent the recommended work-up for CURB scores of 2+.
- Documentation of CURB-65 score was low, and those with a documented CURB-65 score were no more likely to receive CURB-65-compliant antibiotics.

References

- Restrepo MI, Faverio P, Anzueto A. Long-term prognosis in community-acquired pneumonia. *Curr Opin Infect Dis.* 2013;26(2):151-158.
- Triantafyllidis C, Kapordelis V, Papaetis GS et al. Guidelines adherence for patients with community acquired pneumonia in a Greek hospital. *Eur Rev Med Pharmacol Sci.* 2012 Jan;16(1):1-9. PMID: 22338542.
- Delaney F, Jackson A. An audit of empiric antibiotic choice in the inpatient management of community-acquired pneumonia. *Ir Med J.* 2017 Apr 10;110(4):545. PMID: 28665084.
- Pulcini C, Botelho-Nevers E, Dyar OJ et al. The impact of infectious disease specialists on antibiotic prescribing in hospitals. *Clin Microbiol Infect.* 2014 Oct;20(10):963-72. doi: 10.1111/1469-0691.12751.