

Research Round Up- Antimicrobial Prescribing in SARS-CoV-2

Introduction

The last research round up provided you with a review some disparate prescribing issues that have arisen and been reviewed due to the current pandemic. One of those articles reviewed was the trend in out of hour antibiotic prescribing before and during the COVID-19 pandemic. This month we will follow up with a review of antimicrobial prescribing practices in patients being treated for SARS-CoV-2 either the use of these for COVID-19 itself or for detected secondary infection.

Antimicrobial Prescribing Practices at A Tertiary-Care Centre in Patients Diagnosed With COVID-19 Across the Continuum of Care

In this article from July 2020 published by Cambridge University Press we start to see some early evidence looking at the rate and spectrum of antibiotic prescribing being collected in a single centre study. This study was a retrospective review of data of local patients diagnosed with COVID-19 at a large, academic, tertiary-care treatment centre and included all inpatient, emergency department (ED), or outpatient encounters of patients with confirmed COVID-19 infection to analyse the prevalence, number of agents, spectrum of activity, and duration of antimicrobial therapy. Only adult patients' records were reviewed and those who had had covid-19 confirmed by PCR test. The records reviewed spanned the period between 1st March and 29th April 2020 leading to 346 patient records meeting inclusion criteria to be studied. Across the entire cohort, 10% of patients received antimicrobial therapy for a mean duration of 5.7 days. Antimicrobials were administered in 59% of all inpatients with rates of 29%, 47%, and 87% for mild, moderate, and severe cases, respectively. Prescribing rate, spectrum, and duration appeared to increase with disease severity in inpatients. Antimicrobial prescribing in patients managed in ambulatory and outpatient settings was less common.

<https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/antimicrobial-prescribing-practices-at-a-tertiarycare-center-in-patients-diagnosed-with-covid19-across-the-continuum-of-care/75C49E3A4EAF335AE7E51C6C324D9804>

Antibiotic Prescribing in Patients With COVID-19: Rapid Review and Meta-Analysis

This in press rapid review publication using a modified Cochrane review methodology, sought to elucidate the prevalence of antibiotic prescribing during patient infection with COVID-19. Numerous databases were searched to find studies fitting inclusion criteria which included laboratory-confirmed SARS-CoV-2 infection, across all healthcare settings and age groups and considered cohort studies, case series and randomised control trials. The authors excluded reviews, editorials, letters and case studies. They also excluded any larger studies where the number and percentage of infected patients on antibiotic therapy was not reported. The authors suggest that despite frequent antibiotic prescribing to patients with COVID-19, the prevalence of bacterial co-infection and secondary infection in patients hospitalized with COVID-19 is relatively low at 3.5% and 14.3%, respectively according to their review of the available literature. The main outcome of interest was proportion of COVID-19 patients prescribed an antibiotic, stratified by geographical region, severity of illness and age.

7469 studies were screened and of those, 154 met their inclusion criteria. Prescribing data and antibiotic data were available from 30 623 patients across the 154 studies reviewed. The authors found that the prevalence of antibiotic prescribing across the papers included was 74.6%. On subjecting the data to univariable meta-regression, antibiotic prescribing was lower in children (prescribing prevalence odds ratio (OR) 0.10, 95% CI 0.03e0.33) compared with adults. They also discuss the fact that antibiotic prescribing was seen to be higher with increasing patient age (OR 1.45 per 10 year increase, 95% CI 1.18e1.77) and also reported a higher incidence of prescribing with increasing proportion of patients requiring mechanical ventilation (OR 1.33 per 10% increase, 95% CI 1.15e1.54). Their findings revealed that the estimated bacterial co-infection was 8.6% (95% CI 4.7e15.2%) from 31 studies.

The authors concluded from these findings that up to 75% of patients with COVID-19 are prescribed antibiotics, but that prescribing of the antibiotic therapy is not synchronised with but is in fact significantly higher than the estimated prevalence of bacterial co-infection. Unnecessary antibiotic use is likely to be high in patients with COVID-19, and further studies on the rationale for and decision making underpinning prescribing practices is require to explain this phenomenon.

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A Point Prevalence Survey to Assess Antibiotic Prescribing in Patients Hospitalized with Confirmed and Suspected Coronavirus Disease 2019 (COVID-19)

This point prevalence survey of antibiotic use was conducted on 22 April 2020, at 08:00 h in patients with suspected and confirmed COVID-19 at the National Centre for Infectious Diseases and Tan Tock Seng Hospital in Singapore. The aim of this was to confirm or refute the hypothesis that increased antibiotic use during the pandemic could result in an increase in antimicrobial resistance. The authors discuss early studies which report high antibiotic use in COVID-19 patients and the concerns of clinicians around this prescribing trend. They chose to use a point prevalence survey as it is a quick and easy tool that can be used for many aspects of healthcare intervention. The aim was to use the data to inform antimicrobial stewardship activity and policy. 577 patients met the inclusion criteria of being on systemic antibiotics and were included in the study for screening.

The authors report that thirty-six (6.2%) patients were on antibiotics and which were started at median of 7 days (inter-quartile rate (IQR), 4, 11) from symptom onset. Fifty-one antibiotics were prescribed in these patients. Overall, co-amoxiclav (26/51, 51.0%) was the most often prescribed antibiotic. Thirty-one out of 51 (60.8%) antibiotic prescriptions were appropriate. Among 20 inappropriate prescriptions, 18 (90.0%) were initiated in patients with low likelihood of bacterial infections. The low antibiotic prevalence was likely to be a result of fewer severely ill cases, with only 1.9% admitted to ICU. Antibiotics were typically started in the second week of illness during the hyperinflammatory phase, making the differentiation between viral and secondary bacterial infection challenging. Antibiotic prescriptions were more appropriate when reviewed by infectious diseases physicians (13/31 [41.9%] versus 2/20 [10.0%], $p = 0.015$), and if reasons for use were stated in notes (31/31 [100.0%] versus 16/20 [80.0%], $p = 0.019$).

The authors conclude that although there was allow prevalence of antibiotic use in both confirmed and suspected infection with COVID-19, there was a significant percentage of inappropriate

antimicrobial prescription in patients where a secondary bacterial infection was unlikely. This information should be used to allow antimicrobial stewards to inform and educate prescribers in the future.

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Conclusion

What is clear is that the COVID-19 pandemic continues to impact on many aspects of healthcare provision and this month's focus on antimicrobial prescribing and stewardship shows the variety and progression of evidence on such an area of healthcare practice. Like many emerging areas of research around the pandemic effects it is likely that more evidence on this will continue to be published over the next few months and even years. What is clear from the evidence presented above is that antibiotic therapy is of dubious benefit in treating COVID-19 infection but may be more useful where secondary bacterial infections are detected and confirmed. It also shows that even in the time of a global pandemic, antibiotic stewardship remains a vital role for the prescriber and it is important to continue to prescribe antibiotic therapy in a clinically appropriate manner.