



Advice to Antimicrobial Management Teams (AMTs) on antimicrobial prescribing in suspected lower respiratory tract infections in the context of the COVID-19 pandemic

There is a lack of published evidence supporting bacterial co-infection in COVID-19 in the non-critical care setting [1] and in contrast to experience with severe influenza, staphylococcal and pneumococcal pneumonia have not been widely reported. Clinical overlap between bacterial lower respiratory tract infections and COVID-19 may complicate initial antibiotic prescribing decisions and may explain the high rates of antibiotic prescribing in published COVID-19 case series [2, 3].

Although nosocomial bacterial infection is frequently suspected and treated in patients ventilated with COVID-19 pneumonia, there are limited published data describing microbiology in COVID-19 in critical care. It is important that diagnosis of bacterial (and fungal) infection in COVID-19 is optimised and that antibiotic therapy is focussed on those at the greatest risk and with the best clinical evidence of co-infection. Whilst there is broad agreement with the key messages in the recently published NICE COVID-19 rapid pneumonia guideline [4], SAPG advice reflects prescribing practice in NHS Scotland and differs in specific antibiotic recommendations.

Key considerations in recognition/diagnosis of COVID-19 respiratory tract infection/pneumonia

- 1. Clinical features of COVID-19:** Dry cough, fever, myalgia, fatigue and dyspnoea are typical. Purulent sputum is infrequent and when present implies bacterial infection. Gastrointestinal symptoms, anosmia and delirium (in the elderly) are recognised. Healthcare associated COVID-19 should be considered in any hospitalised patient with new onset fever or respiratory symptoms.
- 2. Differentiating COVID-19 infection from bacterial respiratory tract infection:** Bilateral interstitial changes are typically seen however radiological features are variable (including lobar changes) and chest x-ray may frequently be normal. Lymphopenia and transaminitis are common. CRP is usually raised and does not signify bacterial infection. Procalcitonin may also be raised (particularly in severe COVID-19 disease) and needs to be interpreted with caution. Blood cultures, sputum and deeper airways sampling (when appropriate) should be obtained to support bacterial (or fungal) infection diagnosis.

Recommendations for antimicrobial prescribing in suspected/proven COVID-19 infection

- 1. Suspected COVID-19 and no purulent sputum (non-critical care):**
 - a. Do not use CRP to guide antibiotic prescribing**
 - b. Normal chest X-ray:** Do not prescribe antibiotics
 - c. COVID-19 compatible chest X-ray:** Consider not prescribing antibiotics or discontinuing those that have been commenced prior to admission
- 2. Infective Exacerbation of chronic obstructive pulmonary disease (IECOPD):**
 - a. Without purulent sputum:** Do not prescribe antibiotics
 - b. With purulent sputum:** Prescribe doxycycline or amoxicillin (if not already prescribed prior to admission)
 - c. Avoid broad spectrum antibiotics** (e.g. co-amoxiclav or levofloxacin) unless indicated by microbiological culture and sensitivities

3. **Suspected bacterial pneumonia (community or healthcare onset):** follow local severity-based community acquired pneumonia (CAP) or hospital acquired pneumonia (HAP) guidance. Consider doxycycline in place of clarithromycin if atypical cover is required.
4. **Limit antibiotic duration in suspected IECOPD, CAP or HAP to 5 days**
5. **Antibiotic review**
 - a. **Review IV antibiotic therapy daily:** Implement IV to oral switch therapy (IVOST) when clinical improvement and oral route available. Do not use CRP to guide IVOST decision.
 - b. **Review all antibiotics following a SARSCoV-2 result:**
If COVID-19 positive: Stop antibiotics unless strong suspicion of co-existent bacterial infection
If COVID-19 negative: Stop antibiotics unless strong evidence of bacterial infection. Complete the 5 day course of antibiotics if bacterial infection is thought likely. Note that late presentations of COVID-19 infection may be associated with negative virology results
6. **Ventilator associated pneumonia VAP):** optimise microbiological sampling (including for fungi) to guide targeted therapy.
7. **Antibiotics in patients at End of Life:** As part of treatment escalation planning and shared decision making, if a patient is identified as at end of life discuss and agree limits on current antibiotic treatment and further escalation of antibiotic therapy.
8. **Specific COVID-19 directed therapy:** At present there is no proven antiviral or immunotherapy for COVID-19 infection. Experimental treatments (including hydroxychloroquine/chloroquine, azithromycin, remdesivir, immune modulators) should be restricted to use within clinical trials. Note that hydroxychloroquine/chloroquine and azithromycin are associated with risk QTc prolongation [5]

References

1. Rawson T M, Moore L S P, Zhu N et al [Bacterial and fungal co-infection in individuals with coronavirus: A rapid review to support COVID-19 antimicrobial prescribing](#). Clin Infect Dis ciaa530, 02 May 2020
2. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z et al., [Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study](#). Lancet. 2020; 395(10229):1054-1062.
3. International Severe Acute Respiratory and Emerging Infections (ISARIC) Report 27 April 2020 https://media.tghn.org/medialibrary/2020/05/ISARIC_Data_Platform_COVID-19_Report_27APR20.pdf
4. NICE. COVID-19 rapid guideline: antibiotics for pneumonia in adults in hospital <https://www.nice.org.uk/guidance/ng173/resources/prescribing-tables-to-guide-decision-making-about-antibiotic-choice-pdf-8719038253>
5. MHRA guidance on corona virus (COVID-19) <https://www.gov.uk/government/collections/mhra-guidance-on-coronavirus-covid-19>