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LETTER TO THE EDITOR

# Bacterial Coinfections in COVID-19 Patients without a Positive Microbiologic Result: a Word of Caution

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Following the publication of the retrospective study by Baghdadi and colleagues about bacterial infections and antibiotic use among coronavirus disease 2019 (COVID-19) patients (1), we have some concerns that we would like to report.

The authors estimated the incidence of bacterial coinfections on admission and secondary infections after admission in COVID-19 patients using discharge diagnosis codes rather than microbiological results. The authors justify this approach with the relatively low sensitivity of cultures and the low propensity of clinicians to send specimens for bacterial cultures. Even though we are aware of the low diagnostic yields of respiratory cultures in community-acquired pneumonia (2), we think that obtaining blood cultures or other microbiological specimen cultures (as clinically appropriate) in COVID-19 patients admitted to a hospital is important because of the risk of secondary infections in patients with viral pneumonia (3) and the importance of cultures in driving and tailoring antibiotic prescriptions. In particular, negative cultures obtained before antibiotic therapy may accelerate antibiotic discontinuation/de-escalation, given the widespread empirical use of antibiotics in COVID-19 patients (4, 5).

Baghdadi et al. found a surprisingly high incidence of bacterial coinfections (18.5%) upon hospital admission (in contrast to 3.9% for secondary infections), which is not consistent with previously published data (1, 6, 7). Moreover, the most common bacterial coinfections upon admission seem to be urinary tract infections, which do not have a clear causal path with viral pneumonia to justify an increased incidence. Furthermore, unspecified bacterial pneumonia, reported as the second-most-common coinfection, poses serious concerns related to the challenge of differential diagnoses in patients with COVID-19 due to the unhelpfulness of radiological and clinical findings to discriminate between viral and bacterial pneumonia.

It is likely that the use of diagnosis codes to identify bacterial infections led the authors to overestimate the true incidence of bacterial coinfections in COVID-19 patients. The same authors disclose this suspicion in the Discussion; nevertheless, in our opinion, they do not underline enough the potential detrimental effect of such an overestimation in terms of antibiotic overprescription. According to the authors' results, clinicians might be justified in increasing antibiotic prescriptions in COVID-19 patients, at home or early during the hospital stay, in the absence of solid evidence of bacterial coinfections. This approach might have deleterious consequences in terms of antibiotic-related adverse events and antimicrobial resistance development. We do agree that the constellations of signs and symptoms in COVID-19 patients may easily mimic bacterial infections, but we also believe that clinical suspicion alone is not enough to diagnose a bacterial coinfection in COVID-19 patients; consequently, an appropriate microbiological workup before the inception of an antibiotic prescription in the case of a definite diagnosis of viral pneumonia, such as in the case of COVID-19, should be advocated.

Observational studies with well-defined diagnostic criteria are required to define the exact burden of bacterial infections in COVID-19 patients. Clinicians should be aware of



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the importance of reserving antibiotic therapy for patients for whom there are solid clinical and microbiological data to support the presence of bacterial infections.

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