

# Early Infectious Diseases Consultation and Procalcitonin-Guided Therapy Limits Unnecessary Antibiotic Use in COVID-19

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**Background:** Antibiotic stewardship has been a central challenge of the COVID-19 pandemic. Empiric antibiotic therapy is offered in 56.6%-74.6% of inpatients with COVID-19, with microbiologically confirmed bacterial pneumonia reported in only 3.5%-16% of cases. Procalcitonin (PCT) as a biomarker for bacterial infection is of interest in improving antibiotic use. PCT-guided antibiotic stewardship initiatives have demonstrated reduction in the use of antibiotics in the COVID-19 pandemic. An Infectious Diseases (ID) consultation was obtained on most patients at our institution throughout the COVID-19 pandemic. We report a significant reduction in antibiotic use among COVID-19 patients in the setting of near-universal ID consultation in COVID-19 patients.

**Methods:** We evaluated the records of 1346 patients with COVID-19 from March 2020 – May 2021 at four hospitals with ID consultant availability. We assessed the inclusion of an ID consultant, antibiotic indication, initiation and discontinuation, PCT levels, radiologic images, and changes to therapy decisions. A chi-square test of independence and simple logistic regression were conducted to determine whether an association exists between the PCT level and the decision to discontinue antibiotics.

**Results:** Of 1346 patients with a confirmed COVID-19 diagnosis, 64.6% (870/1346) received antibiotics on admission. The most common diagnosis associated with initial antibiotic administration was bacterial pneumonia (692/870, 79.5%). An ID consultation was obtained on 97.8% (677/692) of the patients that received antibiotics for suspected bacterial pneumonia. In 48.1% (326/677) of these patients, antibiotics were discontinued within the first 48 hours of the ID consultation. A statistically significant difference was noted between the PCT level and continuation of antibiotics ( $X^2 = 67.02$ ,  $p < .01$ ). The odds of discontinuing antibiotics for the upper (PCT > 0.51) and middle (PCT = 0.26-0.50) groups were 0.22 and 0.37, respectively, when compared to the lower (PCT ≤ 0.25) group.

**Conclusion:** Early consultation of an ID specialist and evaluation of PCT levels leads to significant reductions in inappropriate antibiotic use. PCT may be a useful adjunct in assisting with the decision to discontinue antibiotics.