

Too many COVID-19 patients get unneeded 'just in case' antibiotics

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More than half of patients hospitalized with suspected COVID-19 in Michigan during the state's peak months received antibiotics soon after they arrive, just in case they had a bacterial infection in addition to the virus, a new study shows. But testing soon showed that 96.5% of them only had the coronavirus, which antibiotics don't affect.

The 3.5% of patients who arrived at the [hospital](#) with both kinds of [infection](#) were more likely to die. But the study suggests that faster testing and understanding of infection risk factors could help hospital teams figure out who those patients are—and spare the rest of their COVID-19 patients the risks that come with overuse of antibiotics.

The new paper, published in *Clinical Infectious Diseases* by a team from the University of Michigan, VA Ann Arbor Healthcare System and St. Joseph Mercy Health Care System, is based on data from more than 1,700 hospitalized patients.

The data came from 38 hospitals taking part in a massive statewide effort called Mi-COVID19 that launched within weeks of the first case of COVID-19 being diagnosed in Michigan on March 10. It leverages the power of multiple quality improvement efforts sponsored by Blue Cross Blue Shield of Michigan.

During March and April, Michigan was one of the nation's early hotspot states, and the authors hope the new data will help patient care teams in current and future hotspots. Inpatient COVID-19 treatment guidelines shared by Michigan Medicine, U-M's academic medical center, have been updated based on these results.

Variation and change

In addition to widespread overuse of antibiotics, the study shows that hospitals varied widely in their use of antibiotics among people newly hospitalized for suspected COVID-19. In some, only a quarter of suspected COVID-19 patients received them within two days of being hospitalized, while in others, nearly all did.

As time went on, and COVID-19 test turnaround time shortened, the use of antibiotics dropped—but was still too high, says Valerie Vaughn,

M.D., M.Sc., the study's lead author and a hospitalist physician who helped launch Michigan Medicine's COVID-19 intensive care units.

"For every patient who eventually tested positive for both SARS-Cov2 and a co-occurring bacterial infection that was present on their arrival, 20 other patients received antibiotics but turned out not to need them," says Vaughn. "These data show the crucial importance of early and appropriate testing, with rapid turnaround, to ensure appropriate use of antibiotics and reduce unneeded harm."

In addition to putting patients at risk of opportunistic infections like *Clostridium difficile* that can worsen their odds of recovery, antibiotics also pose a broader risk of feeding the epidemic of drug-resistant bacteria that already plagues many hospitals and can put patients and staff at risk.

Massive data

The new study wouldn't have been possible without the Mi-COVID19 registry, which includes detailed data from pre-, post- and in-hospital care on COVID-19 patients treated in hospitals of all sizes and kinds across Michigan.

Mi-COVID19 draws on the network of trained data-harvesting nurses and other staff, and physician partners, who before the pandemic focused on studying and improve care for hospitalized patients through a type of organization called a collaborative quality initiative or CQI.

The Mi-COVID19 effort is based in a CQI called the Michigan Hospital Medicine Safety Consortium, working in partnership with 11 other CQIs all sponsored by BCBSM. Additional publications about COVID-19 care are now being prepared that will draw on the data generated by the partnership.

Older people, people who had come to the hospital from a nursing home, and people who were admitted straight to intensive care were more likely to turn out to have a bacterial infection in addition to coronavirus. Half of these patient died, compared with 18% of those without bacterial infections.

Those who received antibiotics were more likely to be older, to have lower body mass index measurements, to have visible signs of infection on their chest X-ray, and to be in more critical condition when they arrive at the hospital.

The importance of rapid and appropriate testing

Vaughn, who has studied and worked to improve antibiotic prescribing for hospitalized pneumonia patients, notes that COVID-19 differs in important ways from regular pneumonia, so standard "antibiotic stewardship" techniques may not work.

For instance, many suspected COVID-19 patients had their blood tested soon after admission to the hospital to look for a substance called procalcitonin, which is often used as an early indicator of bacterial infection while doctors wait for more definitive test results.

Just over half of those who turned out to have a bacterial infection plus COVID-19 had a high procalcitonin reading. But so did 22% of those who didn't have bacterial infections. However, a low procalcitonin reading was almost certain to mean that the person didn't have a bacterial infection.

However, elevated white blood cell counts were a good predictor of who had a bacterial infection.

The faster patients got their COVID-19 viral test results back, the faster

their antibiotics were stopped. Half were stopped within a day of a positive coronavirus test. The turnaround time for such tests decreased over time, with 89% getting their results within a day in May compared with 54% in March.

The vast majority of the patients tested for bacterial infections didn't have test that look in the respiratory tract. This may be because these tests require health workers to interact with patients' airways—which can generate aerosols and risk transmitting [coronavirus](#)—or because they require a sample of coughed-up sputum, which most of the patients didn't have because of the 'dry cough' that typifies COVID-19.

"Since their SARS-Cov2 infection explains their symptoms, we should all be more judicious with prescribing antibiotics unless we see signs of a bacterial infection," says Vaughn. "We need better guidance to help clinicians figure out if the cause of a rapid decline in condition is due to cytokine storm or bacterial infection, and better antibiotic stewardship programs to support physicians in determining if they need to order antibiotics and if so, for how long and with what tests for [bacterial infection](#)."

The study actually undercounts the percentage of patients who received [antibiotics](#), Vaughn notes, because it left out those who received azithromycin. For a time that powerful drug was seen as promising for COVID-19 patients, in combination with hydroxychloroquine, though it has since been shown to be ineffective or even potentially harmful.

Patients who were transferred to another hospital as part of their initial COVID-19 stay were also omitted from the analysis.

More information: Valerie M Vaughn et al, Empiric Antibacterial Therapy and Community-onset Bacterial Co-infection in Patients Hospitalized with COVID-19: A Multi-Hospital Cohort Study, *Clinical*

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