Efforts to treat sepsis faster have not resulted in antibiotic overuse

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Hospitals and policymakers alike have banded together to improve recognition and treatment of sepsis, a life-threatening reaction to infection, which by some estimates, accounts for 30–50% of all deaths

in hospitalized patients. Lessening sepsis' deadly effects means clinicians need to move quickly to recognize the signs and symptoms, and initiate treatment with antibiotics.

However, a parallel movement within healthcare to limit the unnecessary use of antibiotics has caused some experts to wonder whether efforts to treat sepsis faster, and the use of time-to-treatment thresholds as a hospital performance measure, could lead to overuse of antibiotics and the emergence of antimicrobial resistance.

New research from the University of Michigan Medical School, the VA Ann Arbor and Kaiser Permanente helps puts these fears to rest.

Led by Hallie Prescott, M.D. of the U-M Health Division of Pulmonary and Critical Care and Vincent Liu, M.D., of Kaiser Permanente Division of Research, the study looked at data from more than 1.5 million patients from 152 hospitals nationwide from 2013 through 2018. Patients included came to the emergency department with signs of systemic inflammatory response syndrome (SIRS), which includes increased heart rate, abnormal body temperature, among other signs.

The research team analyzed the use of antibiotics in these patients, including how many received antibiotics, when their treatment started, how long they were on the medications and the broadness of spectrum of the antibiotics: in other words, how many different bacteria species the antibiotics would kill.

"We showed in the overall cohort, that antibiotic use decreased. There was a slight decrease in the proportion treated within 48 hours, a more impressive decrease in the average number of days of antibiotic treatment, and also a decrease in the use of broad-spectrum antibiotics," said Prescott.

The findings are published in *JAMA Internal Medicine*.

About half of the people who met the criteria for SIRS received antibiotics within 12 to 48 hours after admission, a practice that decreased slightly over time. At the same time, 30-day mortality (how many people died within 30 days of their hospital stay), length of hospitalization, and the development of multi-drug resistant bacteria also decreased.

"This study adds to our national conversation about how to combat sepsis most effectively. It also confirms that we now need to look for new opportunities to mitigate sepsis by finding patients at high risk before they arrive at the hospital, identifying hospitalized patients most likely to benefit from specific treatments, and enhancing their recovery after they survive sepsis," said Liu.

Prescott agrees.

"The pushback has been [time-to-treatment for sepsis] should not be a performance measure because it's going to cause more harm than good, and I think our data shows it probably does more good than harm," Prescott said. "We have shown that 152 hospitals have been able to make improvements in stewardship and sepsis treatment at the same time, contrary to popular belief."

More information: Hallie C. Prescott et al, Temporal Trends in Antimicrobial Prescribing During Hospitalization for Potential Infection and Sepsis, *JAMA Internal Medicine* (2022). DOI: 10.1001/jamainternmed.2022.2291

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