Metformin inhibited C. diff spread in three study models

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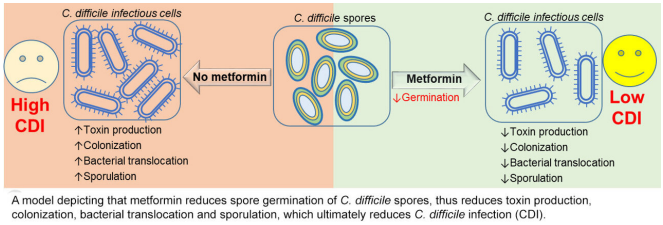

Metformin and C. difficile. Credit: Shaohua Wang, PhD, and Hariom Yadav, PhD

Researchers from Wake Forest School of Medicine in North Carolina have demonstrated that a common diabetes drug inhibits the spread of Clostridioides difficile, or C. diff—a potentially life-threatening infection commonly acquired during hospital stays. The team will present their work virtually at the American Physiological Society's (APS) annual meeting at Experimental Biology 2021.

C. diff is the most common hospital-acquired infection in the U.S. It starts in the intestines, often after a course of antibiotics. The Centers for Disease Control and Prevention categorizes the bacteria C. diff as a public health threat that "require[s] urgent and aggressive action." In 2017, nearly 223,900 people required hospitalization for its treatment, and at least 12,800 died from it. Of those who recover, 1 in 6 people experience reinfection within eight weeks. Antibiotic-resistant strains are also a growing concern.

Metformin, approved by the U.S. Food and Drug Administration for the treatment of type 2 diabetes, is the fourth most prescribed drug in the U.S. Earlier studies have shown that metformin beneficially alters the microbiomes of people with diabetes and of the elderly. Inspired by these findings, Shaohua Wang, Ph.D., a researcher in the lab of Hariom Yadav, Ph.D., evaluated the effect of metformin on C. diff infection in three different models. She tested the treatment in cell cultures, mice and an ex vivo model of the human microbiota developed by the lab.

In all three systems, metformin had the desired effect. It reduced C. diff proliferation in the cell culture. In the ex vivo model, it both reduced the population of the pathogen and increased the growth of closely related nonpathogenic bacteria. Lastly, in the mouse model, it reduced C. diff in the colon a hundredfold and limited the pathogen's spread to organs outside the intestine.

Yadav, who now heads the University of South Florida Center for Microbiome Research, plans to move forward with future studies that "determine the mechanisms by which metformin inhibits C. difficile infections and clinical efficacy in patients with [C. difficile infection]."

More information: Abstract title: "Metformin reduces Clostridium difficile infection"

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