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Vaginal bacteria alter sexual transmission of Zika and herpes simplex virus-2

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Bacteria in the vagina can inhibit sexually transmitted Zika virus and herpes simplex virus-2 in women, according to a new study from The University of Texas Medical Branch at Galveston. The findings were discussed at the ASM Microbe 2017 meeting on June 2, 2017, in New Orleans.

"The human vagina has a wide array of bacterial species living in communities called the Microbiome; these are very important for a woman's health," said lead author Megan Amerson, a doctoral student in the department of Human Pathophysiology and Translational Medicine. "When confronted with viruses, such as those responsible for sexually transmitted diseases, these vaginal bacteria can limit or possibly prevent infection by changing the expression of genes within the vaginal cells."

The study tested whether different kinds of bacteria in the vaginal microbial communities can prevent or hinder infection by Zika and herpes simplex viruses transmitted through sexual contact., Amerson and her team used a novel 3D culture system for human vaginal cells. This is the first cell culture system that supports colonization by transplanted vaginal microbiomes from healthy donors. They colonized their cultures with vaginal microbiomes containing mostly Lactobacillus bacteria, which are important for a healthy vaginal system, or with microbiomes lacking Lactobacillus, which are associated with poor vaginal health. Sterile cultures containing no bacteria served as a control group.

Cultures representing the healthy and unhealthy microbiomes were

infected with herpes simplex virus-2 or Zika virus to model sexual transmission of the viruses. After two days, researchers measured how much of the virus was present in the different microbiomes.

The researchers found that herpes simplex virus-2 replicated more in vaginal cultures colonized with microbiomes that had fewer Lactobacillus bacteria. Microbial communities lacking Lactobacillus are also associated with other health issues, including a common vaginal infection called bacterial vaginosis and inflammation of the vaginal tissue. In contrast, microbiomes lacking Lactobacillus had mixed results on Zika virus replication. Some of the microbiomes lacking Lactobacillus allowed for increased replication, while others significantly decreased replication of Zika virus. These findings suggest that specific bacterial species impacted Zika replication. Future studies will identify specific drug targets and probiotic bacteria that could help prevent sexual transmission of these viruses.

Provided by American Society for Microbiology

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