Certain bacteria suppress production of toxic shock toxin: Probiotic potential looms

March 22 2013

Certain *Streptococci* increase their production of toxic shock syndrome toxin 1, sometimes to potentially dangerous levels, when aerobic bacteria are present in the vagina. But scientists from the University of Western Ontario have discovered certain strains of lactobacillus bacteria are capable of dampening production of that toxin according to research published in the journal *Applied and Environmental Microbiology*.

"The risk of potentially fatal toxic shock syndrome appears to be influenced by the types of bacteria present in the vagina," says principal investigator Gregor Reid.

In planning the study, "I figured that the *Staphylococcus aureus* strains with the ability to produce toxic shock syndrome toxin might only do this under certain environmental conditions," says Reid. "In the vagina, that means depending on pH and the other bacteria living there."

The researchers took swabs from women with clinically healthy vaginal status, with intermediate status, and from those diagnosed with bacterial vaginosis. They then identified the bacterial species, and assayed for toxic shock syndrome toxin 1. "In particular, Streptococcus agalactiae, often referred to as Group B streptococci, an organism of particular concern when giving birth, increased toxin production 3.7-fold," says Reid. But various species of lactobacillus repressed toxin production, one by 72 percent.

"These experiments emphasize that for proper clinical care of women,

we need to know all bacterial types present in the vagina," says Reid. "Culturing is inadequate, and while some microscopy is feasible if the viewer develops the expertise to assess the vaginal smears, rapid 16s sequencing systems are needed as a diagnostic tool," because many species are "very difficult to culture," or have never been cultured.

"We need to vastly improve how we diagnose infections and determine the risk of infection of women," says Reid. He also recommends "improving our ability to manipulate microbiota [with probiotics] in lieu of using broad spectrum antibiotics that were developed 40 years ago, and are not very effective in the vagina, and certainly not designed to neutralize toxins."

More information: *Environ. Microbiol.* 79:1835-1842. www.asm.org/images/Communicati … s/2013/0313shock.pdf

Provided by American Society for Microbiology