Lactobacillus Tied to HIV Load in Vaginal Fluid

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BOSTON — The presence of naturally occurring Lactobacillus in the vaginal flora of HIV-positive women is associated with a reduced amount of HIV in the vagina, while the absence of the “good bacteria” is associated with an increased vaginal viral load, researchers found in a prospective observational cohort study of 57 HIV-positive women.

As a key regulator of the vaginal ecosystem, hydrogen peroxide (H$_2$O$_2$)-producing Lactobacillus may decrease HIV-1 replication through direct effects as well as through the suppression of pathogenic bacteria, explained Dr. Jane Hitti of the University of Washington, Seattle.

To evaluate the effects of the bacteria on cervical vaginal lavage (CVL) HIV-1 RNA concentrations over time, she and her colleagues followed 57 HIV-positive women from Seattle and Rochester, N.Y., for up to 5 years, looking at changes in their vaginal bacteria as well as changes in the vaginal viral load and their plasma viral load.

For each woman in the study, plasma and CVL samples were collected for HIV quantification every 3-4 months, as were vaginal cultures to identify H$_2$O$_2$ Lactobacilli. The investigators conducted longitudinal analyses using linear regression to examine the change in log-transformed CVL HIV RNA between two consecutive visits for the same woman as a function of Lactobacillus colonization, adjusting for plasma HIV RNA and antiretroviral therapy.

At the start of the study, 31 women were on antiretroviral therapy and 22 had an undetectable viral load. Lactobacillus was present in 32 of the 57 women. During the study, plasma viral load was detectable at 64% of visits and vaginal viral load was detectable at 17% of visits. While viral load was highly correlated with plasma viral load, it was not significantly correlated with antiretroviral therapy, Dr. Hitti reported at the 15th Conference on Retroviruses and Opportunistic Infections.

“What we found, first of all, was that only about half of the women at any given time were carrying the [H$_2$O$_2$ Lactobacillus], and that some women switched back and forth between carrying the good bacteria and not having it,” Dr. Hitti said. “When these women had the healthy Lactobacillus in the vagina, they tended to have a lower viral load in the vagina.”

The finding remained statistically significant after adjusting for plasma HIV and antiretroviral therapy, she noted.

In looking at visit pairs—two consecutive visits for the same woman—we found that women who acquired the healthy bacteria had a 0.7 log$_{10}$ decrease in their vaginal viral load, compared with women who were stable the whole time,” Dr. Hitti said. “Conversely, women who lost the healthy bacteria had a 0.5 log$_{10}$ increase in their viral load.”

In addition to stressing the importance of maintaining a healthy Lactobacillus vaginal flora for HIV-infected women, the findings may have relevance for secondary prevention strategies, according to Dr. Hitti. “One of the logical next steps is to think about whether it might be possible to develop strategies for increasing the likelihood that women would carry these healthy vaginal bacteria as a way to decrease the amount of HIV in the vagina, which could be helpful in terms of preventing the spread of HIV in the future.”

One possible preventive strategy might be Lactobacillus supplementation, but not with the type of Lactobacillus that is found in yogurt, “which is kind of a cousin, but not with the kind of Lactobacillus that specifically likes to live in the vagina.” Dr. Hitti said. “The ideal approach would be to use the kind of Lactobacillus that specifically likes to live in the vagina. The optimal strategy would be to take a well-characterized preparation of that type of Lactobacillus and conduct trials to look at whether it’s possible to achieve colonization in the vagina.”

A few such studies have been conducted among HIV-negative women to look at colonization, but “I don’t think any similar trials have as yet been done in HIV-positive women, and that’s a direction I hope we can go in,” she said.

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Lactobacillus may decrease HIV-1 replication through direct effects as well as through the suppression of pathogenic bacteria. Researchers found a reduction in HIV viral load associated with the presence of Lactobacillus in the vagina. This finding could have implications for secondary prevention strategies. Further research is needed to determine if Lactobacillus supplementation is a feasible approach to maintaining healthy bacterial colonization in HIV-infected women.