DOXYPEP

POSTEXPOSURE DOXYCYCLINE TO PREVENT BACTERIAL SEXUALLY TRANSMITTED INFECTIONS

LAY SUMMARY

Cisgender men who have sex with men (MSM) and transgender women in the United States have been disproportionally affected by increasing rates of bacterial sexually transmitted infections (STIs) such as syphilis, gonorrhea, and chlamydia. Effective and safe tools to prevent STIs are urgently needed. In one promising approach to prevention, called post-exposure prophylaxis (PEP), people take a dose of a drug after condomless sex. The presence of the drug in the body may then prevent infection. The DoxyPEP study looked how well PEP with doxycycline (doxy-PEP), a safe and widely used antibiotic, prevented syphilis, gonorrhea, and chlamydia infections among MSM and transgender women.

The DoxyPEP study enrolled 501 participants, 374 of whom did not have HIV infection and were taking HIV PrEP, and 174 of whom were living with HIV and on anti-retroviral therapy. To be eligible for the study, people had to both have had condomless sex with a man and to have tested positive for syphilis, gonorrhea, or chlamydia in the previous year. Two-thirds of study participants were randomly selected to receive a supply of doxycycline to use for doxy-PEP, the remaining third were assigned to standard care without doxy-PEP. Participants assigned to doxy-PEP were instructed to take one 200mg dose of doxycycline within 72 hours of condomless sex and no more than once a day. All participants were followed by the study team for one year and tested for STIs every three months.

Study enrollment was stopped early when a planned midway analysis showed that doxy-PEP significantly decreased how often people having condomless sex are diagnosed with STIs. Those taking doxy-PEP had a two thirds reduction in new STIs diagnosed during each three month time period, compared to those not taking doxy-PEP. Doxy-PEP was highly effective regardless of participants' HIV status and reduced the occurrence of each of the three infections: syphilis, gonorrhea, and chlamydia. Of note, doxy-PEP was less effective against gonorrhea (55% reduction per quarter) than against chlamydia and syphilis (about 80% reduction per quarter).

Doxy-PEP was well tolerated and safe; very few people stopped taking doxycycline due to side effects and there were no serious side effects thought to be due to doxycycline. Among persons on the doxy-PEP arm, there was a significant reduction in *Staphylococcus aureus* colonization at month 12 and a slightly higher rate of doxycycline resistance in those who were colonized with *S. aureus*. Further work is ongoing to look at antibiotic resistance including possible effects of doxy-PEP on bacteria in the gut (i.e., the microbiome).

This study demonstrates that doxy-PEP is a safe and effective way to reduce the risk of bacterial sexually transmitted infections among MSM and transgender women with a history of recent STIs and condomless sex, regardless of their HIV status. Both San Francisco and Seattle have issued guidelines for doxy-PEP and the CDC guidelines for doxy-PEP use are under development.

New England Journal of Medicine publication links:

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