

NATIONAL news

HOLD THE SALT, PLEASE

Saliva's low salinity may stop HIV under the right circumstances, and researchers may harness the effect in protective gel by Gip Plaster

One day after the release of data showing that oral sex "contributes significantly" to the spread of HIV, a coincidentally timed study conducted by researchers in Texas explains why oral sex is risky and offers hope for a new gel that could make rectal and vaginal sex safer.

Results of a Centers for Disease Control and Prevention investigation, presented at a Feb. 1 conference in San Francisco, showed that eight of 102 HIV-positive gay and bisexual men studied had not participated in any activities other than oral sex through which they could have acquired HIV.

Those numbers mean that oral sex alone was determined to be the cause of virus transmission in almost 8 percent of study participants. The actual number of men infected by oral sex could be higher, however, since some men studied had participated in more than one risky activity and the exact cause of infection could not be determined.

But exactly how is HIV transmitted through oral sex? And how big is the risk?

According to a study conducted by the University of Texas Medical Branch at Galveston, the receptive partner is at the greatest risk, because body fluid from the other partner enters his mouth. That fluid is usually in such large quantity that it overcomes the body's own defense system, saliva.

A year ago, researchers at UTMB, led by microbiology and medicine professor Samuel Baron, showed that saliva explodes and kills blood cells, including those that harbor HIV. Saliva has this effect on the cells because, unlike other body fluids, it is not salty.

"Saliva is low salt," Baron says. "If you taste it, it's sweet. But if you tear from your eye into your mouth, it tastes salty."

When blood cells come in contact with the lower-salt saliva, they suck in water through osmosis and burst, according to the team's research, which was first reported in February 1999 in the *Archives of Internal Medicine*. The phenomenon is part of what makes casual contact, including kissing, with HIV-positive people safe.

Now, the same researchers claim to have solved a related question: If saliva is so protective, how can HIV be spread through oral sex?

Semen, as well as breast milk from HIV-positive mothers, simply overpowers the protective effects of saliva because, relatively speaking, there is so little low-salt saliva compared to the amount of high-salt semen or breast milk, according to the research published in the February 2000 issue of the *Journal of Infectious Diseases*.

The UTMB researchers reached this conclusion using test-tube experiments in which they added infected white blood cells to both mother's milk and semen from uninfected donors.

Then, scientists immersed the infected substances in a solution that was 90 percent saliva and 10 percent milk or semen. They incremen-

tally reduced the percentage of saliva and boosted the percentage of the saltier substances to see what happened to the infected cells.

"When saliva was reduced to only one-third of the mixture, with the remaining two-thirds being the saltier substances, then saliva was no longer protective against HIV," Baron says.

In situations when semen enters the mouth, it is usually in very large quantities compared to the amount of saliva present.

"Under normal circumstances there is just about one-fifth of a teaspoon of saliva in the mouth. Deposited semen typically would equal more than four times that volume, and mother's milk much, much more," he says.

The study could cause "a paradigm shift for some people" in understanding how the AIDS virus causes infection, Baron maintains.

"We think there are a couple of erroneous conceptions about the transmission of HIV," he says.

First, most physicians believe that HIV is transmitted by free pieces of the virus floating in substances like semen and milk. But very few free pieces are present, Baron says, probably because the HIV carrier makes enough antibodies to bind the virus and make it unable to infect other cells.

Semen and milk are, in fact, high in HIV because they contain white blood cells that shelter the virus, he says. Antibodies cannot

get inside these cells to attack the HIV. Saliva, however, caused these cells and the virus inside them to die.

That phenomenon suggests that if a substance like saliva were present in a rectum or vagina, the cells carrying HIV could explode and die, preventing infection.

Baron and his colleagues are now working to develop a gel that could mimic the protective effects of saliva in the vagina and rectum, two environments that are normally saltier than the mouth.

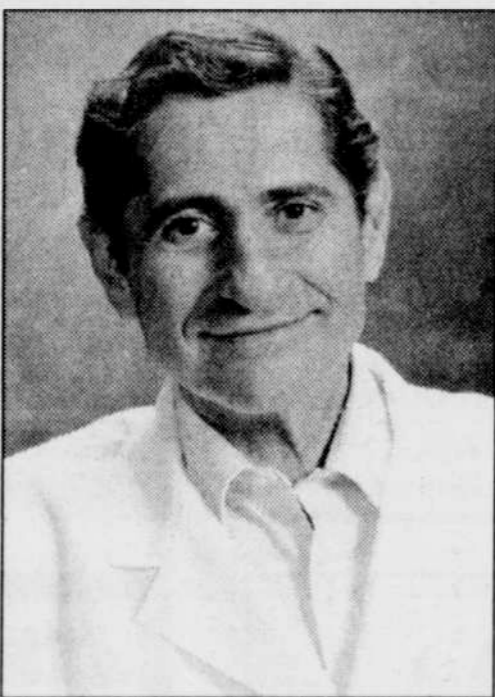
"If the mouth is so powerful so that under normal circumstances it can kill, can we adapt this to the very vulnerable vagina and rectum?" Baron ponders.

His team's findings on that topic could be released as early as April.

Baron says a product already being sold as a lubricant may have all the necessary properties to mimic saliva and help prevent the spread of HIV, but he cannot name the product until the research is published.

Such a gel is needed because the spermicide nonoxinol-9, currently used by some to try to prevent the spread of HIV, has not proven protective in humans, Baron says, adding that nonoxinol-9 is effective in tissue cultures and lab animals, but it irritates human tissues. That irritation may actually make the tissue more susceptible to HIV, creating a portal through which the virus can enter the body.

■ GIP PLASTER writes for dozens of gay and lesbian newspapers and magazines. He also maintains a list of gay publications at www.gayscribe.com. He lives in Fort Worth, Texas, with his partner, David.



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