Lube Alert

A forthcoming research report suggests a number of personal lubricants can damage anal tissue cells and increase HIV replication, potentially heightening the risk of contracting HIV, notably if condoms aren't used.

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The "personal lubricant" market is a thriving one. One popular website sells 53 different brands, with many boasting several varieties. If you'd like one that tastes like fruit or chocolate, or adds the sensation of heat, you've got multiple options to choose from. The same goes for the degree of slipperiness, the type of sex you want to have, the ease of cleanup and, most important, condom compatibility.

What sexual accoutrement retailers can't tell you is whether a lube will increase, decrease or have no effect on your chance of becoming infected with HIV if the condom breaks or you decide not to use a condom in the first place. Until recently, it wasn't a question high on the list of researchers' or manufacturers' priorities—lubes are intended to keep condoms from tearing during sex, end of story. But for scientists at the Population Council, a New York City–based research organization at the forefront of HIV microbicide development efforts, the positive or negative effects of lubricants on HIV transmission has been a nagging issue for years.

New research results from the nonprofit organization suggest there may be reasons for concern. According to laboratory studies the group conducted—on schedule to be published in a forthcoming issue of AIDS Research and Human Retroviruses and currently available online—a large number of popular lubes may actually make it easier for HIV to get past the body's defenses, notably during anal sex without a condom. Even more alarming is the finding that four lubes in particular cause HIV to reproduce up to four times faster than it does in the absence of such products.

The researchers caution that the test tube study results are extremely preliminary and merely suggest a potential problem with several personal lubricants. Further studies, they say, are needed to determine the "real world" implications of these findings, including whether or not these products do in fact increase the risk of HIV transmission. One thing this study makes abundantly clear, however, is that we know very little about one of the main ingredients in the safer-sex recipe.

Lube 101

When it comes to anal sex, lubricants are a condom's best friend, as they help reduce friction and

the risk of tears during intercourse. But what about the benefits of lube alone, in the event the condom breaks or a rubber is left out of the equation altogether? In these situations, experts have reckoned, the use of a slippery substance is likely better than nothing.

Sex without lubrication can damage the epithelium—the thin membrane of mucosal cells lining the rectum and anus (as well as the mouth, nose and vagina) that keep the vast majority of unfriendly bacteria, fungi and viruses out of our bodies. So the thinking goes: The wetter the better.

If this tissue is damaged—because of physical tears, chafing, infection or inflammation from irritating substances—the epithelial cells and the chemical bonds that hold them together can fray, causing the protective system to break down. That's where things can also go wrong with sexual lubricants. Several recent studies suggest that instead of protecting epithelial cells, lubes may actually compromising the integrity of the cells.

Enter Othell Begay and José Fernandez-Romero, PhD, from the HIV/AIDS Division of the Population Council. Begay, Fernandez-Romero and their colleagues, who are particularly interested in developing microbicide gels capable of blocking sexual transmission of HIV, were intrigued by a set of recent reports documenting problems with some of the most commonly available lubricants.

In one study, researchers partnered with the International Rectal Microbicides Advocates (IRMA) to select six of the most popular lubricants used by men and women who practice anal sex. In the process, they tested how these lubes affected epithelial cells as well as the necessary bacteria that help keep the gut and rectum healthy.

That study found that several of the lubes contain more sugar and salt than is typically found inside cells of the anus or vagina. The imbalance causes the epithelial cells to purge their water content and, as a result, become withered and die—a condition called hyperosmolarity.

The study also found that one of the lubes completely wiped out the population of beneficial bacteria in the rectum, a situation that can allow unfriendly organisms—including HIV—to flourish.

A second study looked specifically at the incidence of gonorrhea and chlamydia in people who used lube for anal sex versus those who didn't use lube, either with or without a condom. The study found that rates of these two sexually transmitted infections (STIs) were twice as high in those who used lube compared with those who didn't, again suggesting that lubes were causing the rectum to become vulnerable to infection.

HIV: Another Possible Risk

To explore the matter further, Begay and Fernandez-Romero's team purchased 41 over-the-counter lubricants and pitted them against two substances with known effects on both HIV and epithelial cells. Those two substances were Carraguard, which does not harm epithelial cells and has been studied as an HIV-blocking microbicide, and Gynol II, which contains nonoxynol-9, a substance known to harm epithelial cells and increase the risk of HIV infection. They then posed the same two questions about each of the 41 lubricants: Was the lubricant potentially toxic to

cells, and did the lubricant inhibit or accelerate HIV replication?

As to the first question, the researchers found that all of the lubes, compared with Carraguard, damaged epithelial cells in test-tube tissue samples.

The team was also able to test the osmolality of 32 of the 41 candidates—in other words, to what degree the salt and sugar concentrations of the lubes could cause the cells to purge or retain water. Only one of the lubricants, Probe Personal, had a neutral osmolality, similar to Carraguard. All of the others were either hyperosmolar, similar to the IRMA study findings, or hypoosmolar—capable of causing cells to swell up with water, which can cause them to burst.

More striking and surprising was the answer to the team's second question. While none of the lubricants had HIV-inhibiting qualities that approached that of Carraguard, four Astroglide brand lubricants actually appeared to increase HIV replication in cell cultures by as much as four times, compared with cultures not exposed to lubricants. These results stood in contrast to a previous study documenting anti-HIV activity of Astroglide lubes, and the team sought an explanation.

The Population Council research team analyzed the ingredients of the lubes and found that the four lubes in question—Astroglide Liquid, Astroglide Warming Liguid, Astroglide Glycerin & Paraben Free Liquid and Astroglide Silken Secret—all shared a common ingredient that was not present in the other Astroglide formulations: Polyquaterniums, a class of chemicals commonly found in cosmetic products. Polyquaternium-15, in particular, was in three of the four Astroglide formulations.

Though the specific formulation of polyquaternium-15 is not commercially available, the team tested a very similar chemical (MADQUAT). It too resulted in increases in HIV replication, leading the researchers to suspect that polyquaternium-15 might be the cause.

How is it that we're only coming upon this potentially important safety information now? "Lubricants are classified by the U.S. Food and Drug Administration as a cosmetic, rather than as a medical device," Begay explains. Most people would probably assume that because they can buy lubricants in stores then the products must be safe and don't need further testing, including toxicity testing. Not so. Begay says: "After doing microbicide research and getting all of this knowledge on microbicides and how delicate these epithelial cells are, we discovered that lubricants should be tested."

Fernandez-Romero adds: "The FDA requires that lubricant manufacturers tests lubricants for vaginal irritation. They might consider adding a similar requirement to assess product safety for rectal use."

To Lube or Not to Lube?

The Population Council's results are preliminary, and Fernandez-Romero stresses it remains unclear whether any lubricant might increase the risk of HIV transmission. "The bottom line," he says, "is that more research is needed."

What the paper implies is that not all lubes act the same in cells and tissues in the anus, which could be an issue with respect to HIV transmission. “I think our paper is good,” adds Fernandez-Romero, “because it is saying, ‘There could be a problem here. We have to investigate more.’”

The results also don’t change the fact that the lubes are well tested for their compatibility with condoms, and it is the condom, much more than the lube, that offers the best protection against HIV transmission. “Ultimately, the use of condoms is the best way to prevent transmission, but using a lubricant will prevent condom breakage,” Fernandez-Romero explains. “Lubricants may be important, but they have to be safe. We need assays, models or methods to tell us how safe a lubricant is.”

That said, the results do mean that assessing risk may have gotten more complicated for people who forgo condoms for one reason or another, which includes significant proportions of the population—young and old, gay and straight, male and female.

Fernandez-Romero says his team continues to collaborate with other groups that remain engaged in the study of lubricants and the potential heightened risk of HIV transmission. “We have been participating in conference calls and discussion on the topic with IRMA, but we currently don’t have any funding to look at lubricant safety.” He points out that other researchers, including Charlene Dezzutti, PhD, at the University of Pittsburgh, and Pamina Gorbach, Dr.PH, at the University of California at Los Angeles, “are doing some good work and really trying to find answers.

“More research needs to be done,” concludes Fernandez-Romero, “and we need to find the safest lubricants.”

To read more on the safety of personal lubricants for rectal use, click here to read IRMA’s Q&A for HIV educators and advocates.

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http://beta.docker.poz.com/article/HIV-lubricants-risk-19914-9697