Intriguing findings from study on lubricants

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A vital part of preventing HIV transmission is the use of condoms for both vaginal and anal sex. Many people use personal lubricants as well, for enhancing pleasure and reducing dryness. Using lubricant may also reduce the risk of condoms breaking during sex.

Lubricants may also become important in another area—microbicides. These are prevention products that are being developed in the form of gels, creams, films, sponges and suppositories that contain anti-HIV compounds. Worldwide, most cases of HIV are spread through unprotected vaginal sex. Therefore, it makes sense that microbicides are being designed to work in that part of the body.

An advantage of microbicides is that they could allow women the opportunity to protect themselves before having sex, without the need to get permission or approval from men. This is necessary in many parts of the world, particularly where HIV is endemic. In these regions, women may not have a great deal of power over their lives, particularly when it comes to their sexuality. This makes them vulnerable to infection from HIV positive men.

Both men who have sex with women as well as men who have sex with men engage in anal intercourse, which can also place them at risk for HIV transmission. Because the focus with microbicides has largely been on the prevention of HIV transmission in the vagina, the effect and activity of these products in the rectum may be understudied. However, it is likely that once microbicides designed for vaginal use become widely available they may also be used for anal sex.

As a foundation for future work on microbicides and to better understand the impact of some commonly available personal lubricants and other substances on the rectum, researchers at the Johns Hopkins University School of Medicine in the United States have begun to engage in lab experiments and tests on volunteers. Their findings are intriguing and may give other research teams pause for thought as they develop potential microbicides.

Study details
Researchers recruited 10 men for this study. At different points in time over a period of weeks, the men had different lubricants squirted into their rectums by the research team. These lubricants were:

- ID Glide
- a mixture of ID Glide and FemGlide

These substances were tagged with a tiny amount of radioactive material so that their passage through the rectum and colon could be monitored. Within 1½ hours after administering the lubricants, the study team began to probe the volunteers and removed tiny amounts of tissue from just inside the rectum to as deep as 40 cm (about 16 inches) from the anus into the colon. These tissue samples were observed under the microscope and analysed for changes and damage.

In parallel with this research on people, the research team also conducted lab experiments with the following lubricants and other substances:

- Astroglide
- FemGlide (also sold as Slippery Stuff)
- Fleet enema
• ID Glide
• KY Jelly
• PrePair

Specifically, they assessed the potential of these products to either pull water out of a cell or push water into a cell. If a cell loses water faster than it can be replaced, it becomes injured and can die. If it has absorbed too much water, the cell can also become damaged. Injured or damaged cells lining the rectum can, in theory, make HIV infection easier.

**Results**

In testing these substances in the lab, the study team found that many of them were hyperosmolar—they tended to attract and absorb water from cells lining the rectum. This has the potential to damage these cells. Indeed, the ability of the lubricants to pull water out of cells was between 4 and 14 times greater than the ability of rectal cells to retain water. The lubricant called FemGlide (Slippery Stuff) was the only product that did not have the potential to significantly pull water out of cells. The researchers classified it as hyposmolar, suggesting that it had the potential to push water into cells.

The other lubricants and substances, because they are hyperosmolar and attract and absorb water, have the potential to reduce the layer of mucus that coats the rectum.

Based on the analysis of tissue samples taken from volunteers, damage to cells lining the rectum occurred in less than two hours after lubrication was first applied. In theory, this damage may increase the risk of HIV transmission during sex. However, this study was not designed to assess such a risk and any conclusions drawn about that subject can only be theoretical possibilities.

Another finding from this study was that some lubricants, after being applied just past the anus, can migrate as far as 40 cm up the colon up to four hours after being applied. At such a distance, the lubricant becomes diluted and likely poses little threat to the health of colon cells. However, the potential for other issues (as noted below) arises.

**What’s next?**

The results from this study are intriguing and may stimulate other research teams to conduct studies to confirm and extend the initial findings of the Johns Hopkins team. The results from the present study also have implications for currently available lubricants and future rectal microbicides (which may or may not contain lubricants), including the following:

- Does exposure to certain commonly available lubricants in everyday use lead to rectal injury?
- How long after exposure to some lubricants will the rectum heal itself?
- How often can these products be safely applied to the rectum?
- As lubricants have the potential to migrate up the colon, will the concentration of microbicides still be active against HIV as they migrate and become diluted?
- Is it possible to create lubricants that do not migrate up the colon?

Overall, the results from the Johns Hopkins study show that much work remains to be done to study the potential safety of rectal microbicides and lubricants.

—Sean R. Hosein

**REFERENCES:**


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