



Microbicides for HIV Prevention

An Introduction

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For more basic fact sheets in this series on emerging HIV prevention strategies visit www.avac.org/intro.

What are microbicides?

Microbicides are products designed to be applied in the vagina and/or rectum to reduce the risk of getting HIV if exposed to it during sex. No licensed microbicide is available. It is possible that one microbicide, delivered via a ring worn in the vagina for extended periods of time could be approved for public use in some countries in the next year. These products are being developed in other forms, too: a vaginal film and an insert that dissolves rapidly inside the vagina are in early-stage development. Some products are also being tested that would provide contraception and HIV prevention. For rectal protection, products are in development that look and feel like the douches and lubricants that people often use before or during anal sex—but they also contain anti-HIV drugs to provide protection.

Why do we need microbicides?

Microbicides are designed to affect only the part of the body that needs protection during sex. Daily oral PrEP reduces the risk of HIV prevention and is available today; the drug is taken by mouth and reduces the risk of HIV from vaginal and anal sex; it also reduces risk associated with sharing needles. In other words, the medication affects your whole body. Microbicides, however, are placed specifically in the vagina or the rectum to protect people exposed to HIV during sex. They also user-controlled so people apply them when they want protection; they may not want to be exposed to the product at any other time. Some people prefer this kind of protection because they don't want long-term exposure to medication that affects the whole body. Microbicides will make this possible for people who want protection that they can apply, themselves, when they need it and that doesn't have to be injected or inserted by a medical provider.

The family planning field has found that some people prefer long-acting methods administered by medical providers and some prefer user-controlled methods. Many women, for example, prefer long-lasting contraceptive methods like IUDs, injectables like Depo Provera or Net-En, or implants. Other women prefer user-controlled methods that they can control such as pills, a vaginal ring, a patch or a diaphragm. When people have access to various contraceptive methods and can select what works for them, the rate of accidental pregnancies goes down. HIV prevention can work the same way. Microbicides would provide people with more alternatives so they can pick an HIV prevention methods that matches their current needs.

What is the status of vaginal microbicide research?

Finding effective ways to use antiretroviral drugs and other products to prevent HIV infection in the vagina or rectum without damaging those fragile, complex environments is a big challenge. On top of that is the challenge of formulating these products in ways that appeal to potential users. The 1% tenofovir gel, for example, was shown to be protective against HIV when women used it regularly. But, in research studies, not enough of the participants used the product regularly to make it a promising candidate.

Resources and links

AVAC (www.avac.org)

CONRAD (www.conrad.org)

International Partnership for
Microbicides
(www.ipmglobal.org)

International Rectal
Microbicide Advocates
(www.rectalmicrobicides.org)

Microbicide Trials Network
(www.mtnstopshiv.org)

Population Council
(www.popcouncil.org)

The first microbicide to be submitted for regulatory approval is an intravaginal ring, developed by the International Partnership for Microbicides (IPM). It looks like the contraceptive ring but instead releases dapivirine, an antiretroviral drug, slowly over the course of one month. It differs from many other microbicides in testing in that it is not short-acting. But it is user-controlled (the woman can remove the ring, herself, if she wants to) and its effect is localized (limited to the vagina) rather than systemic (affecting the whole body).

Between 2012 and 2016, IPM and the Microbicide Trials Network (MTN) conducted two Phase III “sister studies” (called The Ring Study and ASPIRE) to test the ring’s effectiveness. With the help of over 4,500 women participants in Malawi, South Africa, Uganda and Zimbabwe, they found that ring use reduced the rate of new HIV infections by **56 percent among** the women who used it as instructed. Interestingly, the women over 21 were more likely to leave the ring in place than were younger women. Social and behavioral research is now underway to learn more about how younger women perceive the ring and what (if anything) might make more of them more interested in using it.

Work is underway to develop a version of the ring that could stay in place for up to three months, as well as combination rings that could provide protection from both pregnancy and HIV simultaneously (known as multipurpose prevention technologies, or MPTs). IPM submitted the vaginal ring to the European Medicines Agency in 2017, will submit to the South African Health Products Regulatory Authority in early 2018 and to national regulatory authorities in other sub-Saharan Africa after that. If it is approved by any of these countries, the vaginal ring may become the first publicly available microbicide by the end of 2019.

What about rectal microbicides?

In 2016, results from MTN 017, the first ever Phase II rectal microbicide study, became available. Designed as a three-arm, open-label trial, it compared participants responses to (1) daily use of a tenofovir gel inserted rectally with an applicator, (2) using the gel and applicator “on demand” (before and after sex only), and to (3) using oral PrEP only, with no microbicide. The 195 MSM and transgender women participants spent eight weeks in each of the three categories. All three of these approaches were found to be safe but participants clearly preferred #2, on-demand usage to daily usage of the gel. There is also interest in developing simpler, more “behaviorally congruent” delivery systems. This refers to devices or practices that integrate easily into common behaviours associated with anal sex, such as the use of lubes, douches or enemas. Input from community consultations and trial participants suggest that such application strategies will be more acceptable to users and should be developed. MTN 026 (known as the Adonis study) will help address this question. It is a planned Phase I safety trial of rectal dapivirine gel that will also look at the feasibility of administering it like a lube (with the fingers and/or penis), rather than with an applicator. It will assess whether this delivery method can get deliver enough drug in the right place to potentially provide protection from HIV. Other early-stage studies are testing additional ARV-based gels for rectal use as well as one non-ARV-based product, Griffithsin.

What other candidate microbicides are under study?

Numerous candidates are in the early phases of development—see more at www.avac.org/trials/microbicides.

- **New delivery mechanisms:** Basic and preclinical work is underway with films and fast-dissolve vaginal inserts that contain a variety of ARVs. This work is in early human trials or preclinical (laboratory-based) research.
- **Non-ARV-based options:** Research on non-ARV-based candidates includes zinc acetate and Griffithsin.
- **Multipurpose prevention technologies:** There is a growing interest in developing tools that could provide contraception and protection against STI’s, including HIV. Vaginal rings are one candidate, as are injectables, films and fast-dissolving vaginal inserts. See www.avac.org/multipurpose-prevention-technologies.

About AVAC | AVAC uses education, policy analysis, advocacy and a network of global collaborations to accelerate the ethical development and global delivery of new HIV prevention options as part of a comprehensive response to the pandemic. More at www.avac.org.