MICROBICIDES AND THEIR ROLE IN HIV PREVENTION

Infectious diseases traditionally evoke two public health responses - prevention and treatment. Unfortunately, the virus that causes AIDS has proven to be much more difficult than anticipated to defeat, forcing scientists to be innovative. HIV vaccines have proven elusive, while treatment has required the combination of several drugs to be effective. Increasingly it is clear that a combination of approaches, both new and old, within a comprehensive response is needed. Microbicides – informed by what has been learned to date about HIV treatment and prevention – represent one of the most promising new ideas to have emerged out of the pandemic. In 2005, microbicides were hailed as one of ten new technologies poised to make an impact on reaching the health-related Millennium Development Goals [1].

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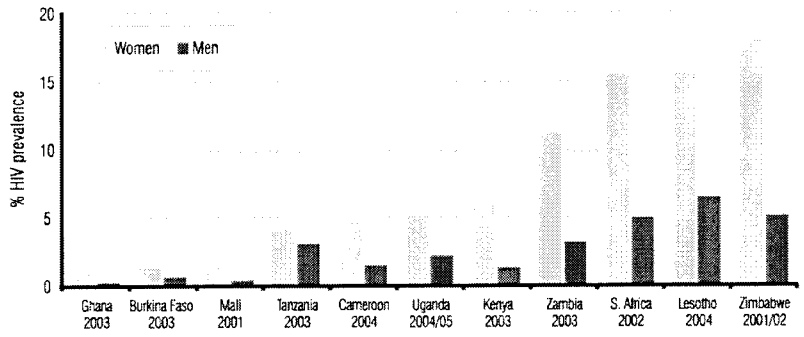
So what exactly are microbicides?
Microbicide is a term used to describe not one drug or product, but a range of substances - literally 'microbe killers' - that could substantially reduce the transmission of HIV and other sexually transmitted infections. Similar to the antibacterial products used in surgery, these products would be applied topically – in the vagina or rectum – to neutralize HIV along with other pathogens. Various potentially effective mechanisms of action are being pursued, from killing viruses and bacteria, or setting up a chemical barrier, to enhancing the body's natural defence mechanisms. A second generation of microbicides are based on antiretroviral drugs that disrupt HIV attachment and replication at the site of transmission. Microbicides could come in many forms, including gels, creams, suppositories, films, or in the form of a sponge or vaginal ring. In the future, it might even be possible to formulate a topical vaccine in combination with a microbicide - thus re-boosting the vaccine every time the microbicide is applied.

HIV prevalence among 15-24 year-old men and women, selected countries in sub-Saharan Africa, 2001-2005



Sources: Demographic and Health Surveys, ORC Macro (Ghana, Burkina Faso, Mali, United Republic of Tanzania, Cameroon, Lesotho, Kenya, Zambia); Department of Health, Uganda HIV/AIDS sero-behavioural survey 2004-2005 (Uganda); Ministry of Health and Child Welfare, Zimbabwe National Family Planning Council, National AIDS Council, and CDC, The Zimbabwe Young Adult Survey 2001-2002 (Zimbabwe); Pettifor AE, et al. HIV and sexual behaviour among South Africans: a national survey of 15-24 year olds. (South Africa).

Source: AIDS Epidemic Update, UNAIDS, December 2005

Microbicides do not yet exist, but currently five candidates are in clinical trials to determine their effectiveness in reducing HIV transmission. With sufficient resources and political will, a microbicide could be ready for distribution in a handful of developing countries by the end of 2010.

The urgent need for microbicides is exacerbated by the feminization of AIDS. Today, women are the fastest-growing sub-group of people living with HIV, and most become infected through heterosexual contact. Women, particularly younger women, are more vulnerable to HIV infection than men for economic, social and biological reasons. In South Africa for example,

one in four women is infected with HIV before the age of 22.

Current prevention options fail to take into account women's social, economic and domestic circumstances. The dominant prevention message is ABC – 'Abstain, Be Faithful and Condomize'. For many women, these messages are inadequate and unrealistic. They assume that marriage will offer protection from HIV and that men will be willing to use condoms. Cruelly, the opposite is often the case. Globally, the majority of women contract HIV and sexually transmitted infections from a husband or steady boyfriend rather than a casual partner. Recommending condom use also requires women to choose between foregoing childbearing and exposing themselves to a potentially fatal disease.

HIV prevention, like contraception and other forms of self-protection, works best when people have a range of options to choose from. Just as good treatment requires combination therapy, effective prevention requires a combination of strategies that target the virus at different stages of its life-cycle. In recent years, efforts have focused on expanding the range of HIV prevention tool.

Microbicides could offer women - for the first time - a method they can initiate that does not require the active co-operation of a male partner. Although many women in acceptability surveys indicate that they do not plan to hide their microbicide use from their partners, they nevertheless would like a product that is unobtrusive and doesn't have to be discussed each time they have sex. Critically, many women also want a product that will allow them to conceive without risk of becoming HIV infected. Non-contraceptive microbicides could be a way for women – including those already living with HIV - to ensure that they have healthy pregnancies and bear healthy children. A European Union-funded social marketing survey revealed a strong interest in using microbicides among women – and men – in developing countries including South Africa, Uganda and Zimbabwe.

Modelling studies have indicated that even with a 60% effective microbicide, over 2.5 million HIV cases could be averted over 3 years among women, men and children. So why are they not available now? The answer is not just about science. New drug development is usually funded by large pharmaceutical companies. These multi-national corporations, however, have demonstrated very little interest in microbicides to date because they see too much uncertainty and too little potential profit. Universities and small, independent biopharmaceutical firms have, therefore, taken the lead. These researchers have to rely on governmental and philanthropic grants

The HIV Prevention Spectrum

Prior to exposure	Point of transmission	Treatment
Behaviour change	Male and female condoms	Anti-retroviral (ARV) therapies
Sterile syringe access and drug addiction treatment	Anti-retroviral (ARV) therapies to reduce mother-to-child transmission	Opportunistic infection therapies
STI screening and treatment	*Microbicides*	*Post-exposure prophylaxis (PEP)*
Vaccines	*Cervical barriers*	
Pre-exposure prophylaxis (PREP)		
Microbicides		

to fund their research and development efforts. Thus, the responsibility for funding the work required to make microbicides a reality falls on the public sector.

Most candidate microbicides are being developed within public-private partnerships, such as the United Kingdom Microbicides Development Programme and the International Partnership for Microbicides. Roughly US$140 million was invested in 2004 in microbicide research and development, more than double the amount invested globally in 2000. Yet, experts estimate that this annual investment must double again and that US$280 million is needed annually to ensure that a safe and effective microbicide becomes publicly available as rapidly as possible.

Not surprisingly, microbicides have attracted both excitement and scepticism. Some fear that people will abandon condoms, fidelity and abstinence in preference to microbicides. While the introduction of microbicides is likely to be followed by increased risk-taking behaviour(s) by some people, their introduction must be reinforced by the sustained use of other HIV prevention interventions.

However, in light of the devastating impact of AIDS on families and communities, many more see microbicides as offering hope for their daughters and a lifeline to those who, unable to control their risk factors, currently have absolutely no way to protect themselves from HIV. Microbicides will not be – and must not be regarded as - a magic bullet. No one technology or strategy will 'solve' the AIDS pandemic. Enthusiasm about these new methods must not be allowed to deflect attention to the underlying social, economic and cultural realities that condition people's risk. We also must work to give vulnerable groups and women especially, the economic and social power to negotiate with their partners the terms and conditions under which sex takes place.

The Global Campaign for Microbicides works towards three critical goals:

1. to raise awareness and mobilise political will for increased funding for microbicide research;
2. to create a supportive policy environment for their timely development, introduction and use; and
3. to ensure that as science proceeds, the public interest is protected and the rights and interests of trial participants, users, and communities are fully represented and respected.

We invite faith-based organisations supporting our goals to endorse the Campaign and help us to advocate for these new prevention options – because it is only through sustained global campaigning that the funding and political will be found to put these urgently needed prevention tools into the hands of the women who need them most without delay.

Rebekah Webb, European Coordinator, Global Campaign for Microbicides [2]
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Resources and web links:

For a basic introduction of the microbicides field and a series of fact sheets on a range of microbicide topics, consult the Global Campaign for Microbicides website:
www.global-campaign.org

Global Campaign for Microbicides (2004). *In Women's Hands.*

Short film about microbicide development in DVD or video format.

Global Coalition on Women and AIDS and UNAIDS (2006). Increase Women's Control over HIV Prevention – Fight AIDS
http://womenandaids.unaids.org

International Partnership for Microbicides (2005). Microbicides – an Essential HIV Prevention Strategy for Achieving the MDGs
www.ipm-microbicides.org

Alliance for Microbicide Development www.microbicides.org

Microbicide Development Programme www.mdp.mrc.ac.uk

References:
1 http://www.un.org/millenniumgoals/
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