

## SEXUALLY TRANSMITTED INFECTIONS, HIV AND OTHER INFECTIOUS DISEASES

Vaginal infections are among the most frequent reproductive health complaints of women worldwide. Bacterial vaginosis, yeast infections, and *trichomonas* are responsible for a large number of clinic visits and a great deal of day-to-day distress among women. The vagina is also a major port of entry for pathogens, and the health of the vaginal environment contributes to women's resistance to such pathogens. Thus, treatments or preventive measures that can improve vaginal health and reduce the frequency of minor infections may also lower the impact and risk of more serious and potentially life-threatening infections, including HIV.

Through our work in this area, we seek to improve our knowledge of the vaginal environment and its interaction with pathogens, to produce and re-interpret epidemiological evidence, and consequently, to identify avenues for improving women's reproductive health. Among our approaches is to explore innovative uses of health technologies, such as new uses of established/approved drugs, to improve vaginal health and to decrease the risk and impact of various infections.

### WOMAN-CONTROLLED ESTROGEN PRODUCTS

Natural fluctuations in hormones during the menstrual cycle result in a thickened vaginal epithelium in the follicular phase that thins during the progesterone-dominant luteal phase. The thinner epithelium is a less effective barrier and could possibly render the reproductive tract more vulnerable to pathogens. In a Phase I randomized controlled trial in the US, Gynuity investigated the delivery of an estrogen gel to the vaginal mucosa as a means of thickening the vaginal epithelium to enhance natural protections against pathogens and maintenance of beneficial vaginal flora. The study results point to a potential role for estrogen in promoting a healthy vaginal environment. Gynuity continues to explore the science behind this approach, as well as ways to improve practical and effective use of such products. In a world that still has no effective, widely available woman-controlled means of preventing STIs, including HIV, this innovative approach may contribute to efforts that enable women to protect their reproductive health.

### VAGINAL AND RECTAL CARRIAGE OF *CLOSTRIDIUM SORDELLII* & *PERFRINGENS*

Clostridia bacteria, *C. sordellii* and *C. perfringens* specifically, have been identified recently as serious pathogens among women of reproductive age. Since 2000, clostridial pelvic infections have claimed the lives of at least 17 young, previously healthy women. While extremely rare, such infections are nonetheless alarming, because they strike healthy women and also, because of their rapid, fatal course, and absence of traditional signs of infection. The most publicized of the Clostridia cases have followed medical abortions; however, available clinical and epidemiological research does not show a specific causal pathway linking use of mifepristone or misoprostol to development of clostridial infection.

Since clostridial infection cases are so rare, Gynuity has embarked on a project on the prevalence of the bacteria to add depth and precision to the very fragmented literature on this topic. We conducted a large, multi-site study of over 5,000 women in the U.S. from 2008-2013. Through screening women at various time points in their reproductive lives and collecting information on their background characteristics and behavior, we are able to describe:

- The prevalence of *C. sordellii* and *C. perfringens* in the vagina and rectum among women of reproductive age
- The duration of presence of these bacteria in women
- Potential correlates of positive cultures: background characteristics, behavioral practices, medical conditions, etc.
- Changes in prevalence following medical and surgical abortion
- The different strains of the bacteria collected in the study and whether the strains differ in terms of potential lethality

Enrollment in this study concluded in mid-2013, and findings will be disseminated in 2014.

### **RELATIONSHIP OF HORMONAL CONTRACEPTIVE USE TO HIV TRANSMISSION**

Concern about a possible association between hormonal contraceptive (HC) use and increased risk of HIV infection has been mounting in recent years. A series of laboratory, clinical and epidemiological studies have contributed to a growing body of evidence that suggests such an association may exist. As of now, however, the association remains speculative, and a causal relationship between HC use and changes in HIV risk has not been established. Given the enormity of the AIDS epidemic, especially among women, and the popularity of HC use in many settings, any evidence that HC use may increase the risk of HIV transmission or contribute to disease progression could be expected to have significant impact on policy and program discussions as well as individual women's decision making.

In response to this potential problem, Gynuity convened a meeting of top experts in the field in May 2005. The meeting's purpose was to review existing evidence and reach consensus on implications for reproductive health and HIV programs and future research. The participants concluded that there is evidence suggestive of increased HIV susceptibility with hormonal contraceptive use among female sex workers. However, no basis exists for women in the general population to change their contraceptive behavior. Gynuity continues to be involved in global efforts to explore and advise on this topic to advance women-centered recommendations.

We continue to engage in a range of activities in these areas, including:

- Clinical research to investigate woman-controlled products for vaginal health and prevention of vaginal transmission of infection.
- Epidemiological and microbiological research to investigate the prevalence and correlates of *C. sordellii* and *C. perfringens* carriage among women of reproductive age.
- Organization of seminars, educational opportunities and training courses.
- Development of training and educational materials for policymakers, clinicians, and users.

## RELATED RESOURCES

- Frequently Asked Questions: Fatal Infection and Mifepristone Medical Abortion. Technical Version, Gynuity (Updated Nov 2006)
- Questions and Answers about HIV and Hormonal Contraception by Gynuity (Updated Jul 2006)
- *Outlook* newsletter on hormonal contraception and HIV by Path and Gynuity (Mar 2006)
- *Issue brief* on hormonal contraception and HIV by Gynuity, Ibis Reproductive Health, and Reproductive Health Technologies Project (Jun 2006)
- "Hormonal Contraception and HIV Transmission: Links? Mechanisms? Implications?" Gynuity Health Projects, New York, May 2005 - Summary of Meeting Outcomes

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