Network

Family Health International

www.fhi.org

Preserving Fertility

Volume 23 Number 2, 2003

NewsBriefs

Male Circumcision and HIV

Although several studies suggest that circumcised men are less likely than uncircumcised men to become infected with HIV, evidence is insufficient to recommend male circumcision to prevent HIV, a systematic review of the research has concluded.

The review, published in the third issue of *The Cochrane Library* in 2003, is the most comprehensive analysis to date of studies on male circumcision and HIV. The reviewers found no published or unpublished results from completed randomized controlled trials on the effect of male circumcision on HIV acquisition. Instead, they assessed 34 observational studies that examined the relationship between male circumcision and HIV, usually as part of an investigation of various risk factors for HIV.

The studies that were reviewed found strong epidemiological evidence of an association between male circumcision and HIV prevention, particularly among groups at high risk of HIV infection. Twenty-seven of the 34 studies found that male circumcision protected men from acquiring HIV, and results from 17 of those 27 studies were statistically significant. However, the differences observed among circumcised and uncircumcised men in these studies could be explained by other factors that might confound the results, the Cochrane reviewers report. Many of the studies, for example, did not adequately account for the effects of important factors that could affect HIV risk, such as religion and sexual practices.

Four randomized controlled studies are under way in sub-Saharan Africa to test the effect of male circumcision on HIV acquisition. The results of these studies, expected in 2005 or 2006, "will need to be carefully considered before circumcision is implemented as a public health intervention for prevention of sexually transmitted HIV," the reviewers concluded.

All four trials will recruit uncircumcised men. Those who agree to participate will be randomly assigned to be circumcised or to be part of an uncircumcised comparison group. Three of the studies — one in Kisumu in western Kenya that is recruiting 2,676 men, one in South Africa's Gauteng Province involving some 3,500 men, and another in Rakai, Uganda, that is enrolling 5,000 men — will determine whether circumcision protects men from acquiring HIV. A related study in Rakai will enroll 2,900 men, including men who are HIV positive, and will follow some 6,000 women in the community to assess the effect of male circumcision on HIV transmission to female partners as well as male acquisition of the virus.

No 'Multiple Ovulations'

Erroneous news reports that women can ovulate more than once during a menstrual cycle resulted from journalists' misinterpretation of a study published in the July 2003 issue of the journal *Fertility and Sterility*, reproductive health experts say.

The experts have responded to news reports about the study that had misleading headlines such as "No 'safe' time to avoid pregnancy." Jeff Spieler, chief of the research division of the U.S. Agency for International Development's Office of Population and Reproductive Health, calls this claim "a total fabrication" that raised unfounded doubts about the efficacy of natural family planning (NFP) methods and oral contraceptives.

In the study, researchers at the University of Saskatchewan in Saskatoon, Canada, tested whether ovarian follicles develop in "waves" in humans, as they do in some animals. A competing hypothesis held that follicles grow only during the first half of a woman's menstrual cycle, until hormones induce one follicle to release an egg.

The researchers observed two to three waves of follicular development during a typical menstrual cycle in 50 women who received daily sonograms. During each wave, a few follicles grew larger than the rest, and one outgrew the others. In each woman, however, only one wave resulted in ovulation.

During the waves that did not result in ovulation, some follicles grew to "an ostensibly pre-ovulatory diameter," the researchers note. "It could, therefore, be speculated," they write, that these follicles could ovulate in the presence of a surge of luteinizing hormone. News reports described this speculative potential for "multiple ovulations" as if they had actually occurred and questioned the efficacy of natural family planning methods requiring accurate estimates of the days when a woman is fertile.

"NFP will not fail because of a second fertile period or secondary ovulation in the same cycle," says Spieler, who has conducted studies on ovulation. "Hundreds of ultrasound studies have been done, and there is no evidence for a second follicle developing to the size of one that will rupture and release another egg later in the same cycle."

In fact, notes Dr. Marcos Arevalo, director of biomedical research at the Institute for Reproductive Health at Georgetown University in Washington, DC, the study's "data on the day of ovulation, and the fact that actual ovulation occurs only once in a cycle, provide support for the efficacy of natural family planning methods."

News reports also suggested that "multiple ovulations" would put some women at risk of unplanned pregnancy during the seven days when they take the placebo pills in a pack of oral contraceptives. "This is simply not true," Spieler says. "Women may wish to switch to a continuous regimen of active pills for other reasons, such as avoiding menstruation, but there is no evidence that they are not protected from pregnancy during that pill-free week."

First 'Extended-Regimen' OC Approved

Seasonale, the world's first extended-regimen oral contraceptive (OC), designed to reduce the number of times a woman menstruates each year, has been approved by the U.S. Food and Drug Administration.

Like many low-dose OCs, Seasonale contains 150 µg of the progestin levonorgestrel and 30 µg of the estrogen ethinyl estradiol. But Seasonale is packaged as a

continued on page 20

Family Health International

Network is published quarterly in English, Spanish, and French by Family Health International and is distributed without charge in developing countries. Periodicals postage is paid at Durham, NC, and additional mailing offices. POSTMASTER: Send requests, queries, and address corrections to:

Network
Family Health International
P.O. Box 13950
Research Triangle Park, NC 27709 USA

Phone: (919) 544-7040
Fax: (919) 544-7261
Web site: *http://www.fhi.org*

Subscription information:
publications@fhi.org

To contact writers: network@fhi.org

Family Health International is dedicated to improving lives, knowledge, and understanding worldwide through a highly diversified program of research, education, and services in family health and HIV/AIDS prevention and care.

Network is supported in part by the U.S. Agency for International Development (USAID). The contents do not necessarily reflect FHI or USAID views and policy.

ISSN 0270-3637
USPS 696-610

Network

Volume 23 Number 2, 2003

Efforts to better prevent, diagnose, and treat the main causes of infertility can help preserve the fertility of millions of couples worldwide. A couple from South Africa appears in the cover photo by David Turnley of Corbis.

In This Issue

Preserving Fertility

Departments

Defining **Infertility**

What infertility means for clinicians and clients.

KEY POINTS

- Infertility often involves both members of a couple.
- STIs are the primary preventable causes of infertility.
- Postpartum and postabortion infections are also associated with infertility.
- Contraceptive use does not cause infertility.

Infertility is complex. It has multiple causes and consequences depending on the gender, sexual history, lifestyle, society, and cultural background of the people it affects.

Partly due to its complexity and to difficulty preventing, diagnosing, and treating it, infertility is a global public health concern. More than 80 million people — about 8 percent to 12 percent of all couples worldwide[1] — are or have been infertile. Although infertility is considered by some to be primarily a woman's problem, men often contribute to and are also affected by it (see article, page 17).

"Infertility is not really an issue of either partner," says Dr. Timothy Farley, previously a member of the World Health Organization (WHO) Task Force on Diagnosis and Treatment of Infertility and currently coordinator of the Department of Reproductive Health and Research at WHO. "Infertility is an issue of the couple."

Infertility arises when either one or both members of a couple are sterile or have severely reduced fertility. Sterility of one partner will always render the couple infertile. But subfertility, or reduced fertility, is more complicated. Subfertility in both partners is likely to lead to infertility, but subfertility in one partner may or may not, depending on the overall combined fertility of the couple.

A couple is considered clinically infertile only when pregnancy has not occurred after at least 12 months of regular sexual activity without the use of contraceptives. At the teaching hospital at the University of Ibadan in Nigeria, gynecologist and senior lecturer Dr. Ayodele Arowojolu, who is also a former FHI fellow, says that clients are discouraged from seeking infertility services until they have failed to conceive for an entire 24 months.

"Clinicians implement these waiting times because otherwise they would be inundated with people who have subfertility problems for which little or nothing needs to be done," says Dr. Farley. Research has shown that many couples seeking infertility treatment are actually subfertile and may eventually become pregnant without any intervention. In an evaluation and two-year follow-up of 455 couples attending an infertility clinic in Chandigarh, India, 14 percent of the couples became pregnant before treatment even started and another 10 percent before treatment was completed.[2] Two studies from developed countries have shown even higher rates of pregnancy — 35 percent in one[3] and 72 percent in the other[4] — among 548 and 342 untreated subfertile couples, respectively.

Preventable causes

Many factors — infectious, environmental, genetic, and even dietary in origin — can contribute to infertility (see table, below).[5] But this list includes factors that produce subfertility, which may not ultimately prevent conception or may subside. An important question, then, is which of these are the major causes of infertility that likely will not reverse without clinical intervention.

Between 1979 and 1984, the WHO Task Force on Diagnosis and Treatment of Infertility supported an evaluation of 5,800 couples who completed a standard diagnostic work-up for infertility at 33 medical centers in 25 countries throughout the developed and developing world.[6] Although the results may not be applicable to all

Factors Contributing to Infertility

- Anatomical problems
- Endocrinological problems
- Genetic problems
- Immunological problems
- Increasing age
- Infectious and parasitic diseases
  - Genital tuberculosis
  - Malaria
  - Schistosomiasis
- Malnutrition
- Potentially harmful substances
  - Aflatoxins
  - Arsenic
  - Pesticides
  - Tobacco, alcohol, or caffeine
- Reproductive tract infections
  - Postabortion infections
  - Postpartum infections
  - Sexually transmitted infections

One Couple's Story: The Uncertainty of Infertility

Each case of infertility is unique in its causes, consequences, and outcomes. One such individual story comes from Jamaica, where 36-year-old Maria (fictitious name) and her husband are trying to conceive.

"My family was asking how come I am married so long and have no children," says Maria. After seven years of having unprotected sexual intercourse with her husband without becoming pregnant, she finally decided to visit her gynecologist.

Maria says that, before the visit, she had no idea what could be causing her infertility. But a series of tests revealed that she is anovulatory (that her ovaries are not producing and releasing eggs). Her husband also went to the clinic to have his semen analyzed and discovered that he is oligospermic (has a suboptimal number of sperm in his semen). So in this case, as in many throughout the world, the couple's infertility can be attributed to both partners. But when asked about the causes of the couple's infertility, Maria never mentions that her husband is also contributing to the problem. "It seems to me that she has assumed full responsibility for the infertility," says Maria's gynecologist, who prefers to remain anonymous to protect Maria's privacy.

In many countries, infertility is perceived as a woman's problem, perpetuated by community beliefs. Maria's gynecologist says that in some areas of Jamaica, a woman who does not conceive within a defined period is considered a "mule," the name for the usually sterile offspring of a donkey and a horse. "Some communities do not accept that a man is sterile until they have proof," she says. "Once, when I shared with a woman the results of her partner's semen analysis, she asked for a copy of the results so that she could show his family that she was not the mule."

Because of Maria's personal characteristics — Christian, Caucasian, and middle class — she may not suffer the same social consequences of infertility that women of many other backgrounds experience. In fact, she says she is coping with infertility "satisfactorily."

Since her diagnosis, Maria has been taking medicine to stimulate ovulation, and she has now been referred for assisted reproduction (see article, page 7). Her husband has been referred to a urologist.

Results from a study of more than 2,000 infertile couples from Canada estimate that about 42 percent of women who are treated for ovulation disorders and almost 30 percent of wives of men who are treated for oligospermia will eventually give birth to a live infant.[1] But additional research has also predicted that couples who have been infertile for three or more years are less likely than others to conceive, and that women who are at least 30 years old and have never been pregnant are less likely to eventually have a live birth.[2]

So what does this mean for this Jamaican couple?

"I am still being treated," Maria says. Meanwhile, like many infertile couples, she and her husband will continue waiting in an emotional limbo, harboring the hope that they will eventually have the good fortune to conceive.

Kerry L. Wright

References

1 Collins J, Burrows E, Willan A. Infertile couples and their treatment in Canadian Academic Infertility Clinics. In Royal Commission on New Reproductive Technologies. *Treatment of Infertility: Current Practices and Psychosocial Implications*. Volume 10. (Ottawa, Ontario: Minister of Supply and Services, 1993)233-329.

2 Hunault CC, Eijkemans MJ, te Velde ER, et al. Validation of a model predicting spontaneous pregnancy among subfertile untreated couples. *Fertil Steril* 2002;78(3):500-6.

populations, this was the largest epidemiological study of its kind, providing unparalleled data on the major causes of infertility.

Results showed no known cause for up to 14 percent of the couples. But in all regions of the world, the largest proportion of remaining diagnoses could be attributed to infection. In particular, women who reported a history of sexually transmitted infections (STIs) had higher rates of infertility than women who did not.[7]

In fact, STIs are recognized as the most common preventable cause of tubal infertility (see article, page 12). Such STIs as chlamydial infection or gonorrhea in the lower genital tract can ascend into the upper genital tract, causing pelvic inflammatory disease (PID) that can produce inflammation, scarring, and eventual blockage of the fallopian tubes.[8]

The WHO study also showed that in every region of the world, a history of postpartum or postabortion complications was associated with blockage of both fallopian tubes. In addition, the percentage of women with both fallopian tubes blocked generally increased if the women had even ever been pregnant, given birth, or had an abortion, regardless of whether complications occurred.[9]

Unsafe obstetric practices during delivery or abortion could introduce new infections that can lead to PID or other problems that hinder conception. Many cases of infertility after delivery or abortion may, however, still be due to STIs. If a woman has gonorrhea or chlamydial infection during pregnancy, her estimated risk of PID increases 50 percent to 100 percent if she either gives birth or has an abortion.[10] In these cases, instruments used during obstetric procedures could carry existing infections into the upper genital tract.

Knowledge and misconceptions

In many cultures, infertility is considered a shameful condition, something that is

Contraception and Return to Fertility

Contraceptive Method	Time to Return of Fertility
Abstinence	immediate
Condoms (male and female)	immediate
Female barrier methods, other than condoms	immediate
Implants	immediate
Injectables	
Combined monthly	immediate
Progestin-only	
Depot-medroxyprogesterone acetate (DMPA)	average 10 months
Norethisterone enanthate (NET-EN)	average 6 months
Intrauterine devices	immediate
Oral contraceptives*	immediate
Sterilization	no return to fertility

* Although return to fertility may be immediate, a delay of a few months has been observed in several studies.

Note: Because all contraceptives protect against pregnancy, they also protect against postpartum and postabortion infections that are associated with infertilty.

Source: World Health Organization. *Improving Access to Quality Care in Family Planning. Medical Eligibility Criteria for Contraceptive Use.* Geneva, Switzerland: World Health Organization, 2000.

not freely discussed. So, not surprisingly, many men and women either do not know or still have misconceptions about the true causes of infertility.

Dr. Silke Dyer is the director of infertility services at Groote Schuur Hospital, a large public tertiary care hospital in Cape Town, South Africa. "I've begun asking almost all of my patients 'Now why do you think you're infertile?' and many of them just shrug their shoulders," she says. "So I think they truly do not know."

Dr. Arowojolu, the gynecologist from the University of Ibadan, Nigeria, agrees that many patients do not understand what is causing their fertility problems. "There is also a lot of mystique surrounding infertility," he says. Because childbearing is viewed as a natural part of adult life, some have explained infertility as supernatural. It has been labeled an act of God, a punishment from unhappy ancestors, or the result of witchcraft. In an urban slum area of Bangladesh, nearly half of 120 men and women surveyed said evil spirits caused female infertility.[11]

Another common misconception — that some forms of contraception cause infertility — may be a powerful disincentive to contraceptive use.[12] Group interviews with men and women in Cameroon's North West Province revealed that contraception was thought to "spoil the womb" and that young, less-educated women were particularly unlikely to use contraception as long as they felt susceptible to infertility.[13] In southwest Nigeria, study participants also suggested that contraceptives can damage the uterus, leading to infertility.[14]

Even family planning providers sometimes misunderstand the effects of contraceptives on fertility. In an FHI study in Ghana, many of 97 providers interviewed said they used age or parity requirements to ensure that only women of proven fertility obtained contraceptives, mainly because they believed that hormonal methods delay fertility or cause infertility.[15]

Because contraceptives prevent pregnancy, they may mask underlying fertility problems, but they do not cause infertility. The risk of long-term impaired fertility after using any contraceptive method is low, and fertility usually returns immediately or shortly after contraceptive discontinuation (see table, this page).[16] In fact, by preventing unintended pregnancy and thus the potential for either postpartum or postabortion infections, all contraceptives can help prevent infertility and improve the chances that women will become pregnant when they choose to do so.

Expectations

While many couples do not know the true causes of infertility, the consequences are often apparent, especially for women in the developing world. Grief and frustration, guilt, stigmatization and ridicule, abuse, marital instability, economic deprivation, and social ostracism are just some of the consequences that have been reported in various parts of Asia and Africa.[17]

Many of these consequences are personal, but others are societal. Throughout the world women are expected to bear children, but these social pressures can be particularly intense in parts of the developing world where voluntary childlessness is rare and opportunities for women, aside from motherhood, are few. In hopes of becoming pregnant, some women who consider themselves infertile may even engage in extramarital relations, a behavior that places them at risk of STIs, including HIV.[18]

Clinicians should be aware that infertile couples also have their own expectations. Dr. Dyer and colleagues from Groote Schuur Hospital, the University of Cape Town, and South Africa's Medical Research Council recently conducted research aimed in part to identify clients' expectations of infertility clinics. The research included a quantitative study of 120 women and a qualitative study of 30 women. All were visiting the Groote Schuur Hospital's infertility clinic for the first time.[19]

When the women were asked about their expectations, three main themes emerged:

continued on page 8

The Possibility of Assisted Reproduction

Infertility management is an important component of reproductive health services. When infertility occurs, couples should not be denied treatment, including assisted reproductive technologies.

Assisted reproductive technologies are most often used to treat infertility caused by damage to or blockage of a woman's fallopian tubes, male infertility, and persistent infertility for which other treatments have not worked. One of the best-known and most common technologies is in vitro fertilization (IVF), a procedure in which a man's sperm and a woman's egg are fertilized in a laboratory and the resulting embryo is transferred into the woman's uterus. Other technologies include intracytoplasmic sperm injection (ICSI), in which a single sperm is injected into a single egg during IVF, and gamete intrafallopian transfer, an alternative to IVF in which sperm and unfertilized eggs are surgically placed in a woman's fallopian tubes.

Global demand for such help is undeniable. But some experts are concerned about the cost and difficulty of providing such interventions in the developing world.[1] In Nigeria, for instance, one cycle of IVF is estimated to cost between U.S. $2,000 and U.S. $2,700, but the minimum wage in Nigeria is typically no more than U.S. $720 a year.[2]

Nonetheless, examples from Africa demonstrate that assisted reproductive technologies are feasible and successful in low-resource settings where staff are trained and equipment is available. In Mombasa, Kenya, an IVF center was created in 1995, and nearly 50 patients had attended by early 2003, according to Dr. Abdallah Kibwana, an obstetrician/gynecologist from Mombasa's Coast General Hospital. At a regional obstetrical and gynecological conference, he reported that 19 of the patients seen at the IVF center have conceived with the help of simple ovarian stimulation, and two babies have been born using IVF.[3]

Also, two cases of successful ICSI have recently been reported from a private IVF clinic in Lagos, Nigeria.[4] In one case, a man had no sperm in his semen, so sperm were extracted from his testes. ICSI and transfer of the resulting embryo into the uterus of his 38-year-old wife resulted in the birth of a healthy baby boy. In the other instance, a 31-year-old woman who had tubal infertility and whose husband had low sperm counts delivered twins after ICSI was performed.

Kerry L. Wright

http://www.who.int/reproductive-health/infertility/index.htm

Current Practices and Controversies in Assisted Reproduction is the report of an expert meeting on "Medical, Ethical and Social Aspects of Assisted Reproduction" held at World Health Organization headquarters in Geneva, Switzerland, in September 2001. This 31-chapter book examines these issues and presents experts' recommendations for clinical practice and research.

References

1 Inhorn MC. Global infertility and the globalization of new reproductive technologies: illustrations from Egypt. *Soc Sci Med* 2003;56(9):1844; Okonofua F. New reproductive technologies and infertility treatment in Africa. *Afr J Reprod Health* 2003;7(1):7-11.

2 Giwa-Osagie OF. ART in developing countries with particular reference to sub-Saharan Africa. In Vayena E, Rowe PJ, Griffin PD, eds. *Current Practices and Controversies in Assisted Reproduction*. Geneva, Switzerland: World Health Organization, 2002.

3 Kibwana AK. Assisted reproductive technology (ART): experience, current and future status. *The 5th International Scientific Conference of the East, Central and Southern African Association of Obstetrical and Gynaecological Societies*, Mombasa, Kenya, February 23-27, 2003.

4 Ajayi RA, Parsons JH, Bolton VN. Live births after intracytoplasmic sperm injection in the management of oligospermia and azoospermia in Nigeria. *Afr J Reprod Health* 2003;7(1):121-24.

Harmful Traditional Practices Can Hinder Conception

Various traditional practices can lead to a narrowing of the vagina, also known as acquired vaginal stenosis (gynetresia), that makes it difficult for some couples to conceive a child, decades of research from Nigeria indicate.

Scarring from female genital cutting was the leading cause of vaginal narrowing among 78 women with vaginal stenosis who took part in a retrospective study conducted between 1980 and 1989 at the University of Nigeria Teaching Hospital in Enugu.[1] In a second retrospective study, conducted from 1967 to 1996 among 126 women with vaginal stenosis at the University College Hospital in Ibadan, most cases were due to chemical vaginitis from insertion of vaginal pessaries (suppositories) that are caustic, a common practice promoted by traditional healers.[2]

Stenosis, if left untreated, can make sexual intercourse uncomfortable or even impossible. In both studies, infertility was recorded as a symptom of the condition for about a quarter of the women.

Authors of both studies emphasized that acquired vaginal stenosis is a public health concern requiring community-based education programs to teach couples about these harmful traditional practices. The lead author of one of these studies and also a former FHI fellow, Dr. Ayodele Arowojolu of Nigeria, reports that obstetricians and gynecologists in that country are using the media to warn members of the public about some of these harmful practices and inform them of modern medical programs to manage infertility.

Kerry L. Wright

References

1 Ozumba BC. Acquired gynetresia in eastern Nigeria. *Int J Gynecol Obstet* 1992;37(2):105-9.

2 Arowojolu AO, Okunlola MA, Adekunle AO, et al. Three decades of acquired gynaetresia in Ibadan: clinical presentation and management. *J Obstet Gynaecol* 2001; 21(4):375-78.

continued from page 6

hope to conceive; hope to receive information about if, when, and how they could conceive; and uncertainty about what to expect. Some women also had unrealistic expectations. Nearly half of the 120 women in the quantitative study thought they would definitely conceive by attending the clinic, and more than one woman from the qualitative study thought that she would be pregnant by the end of her first visit.

"Very often infertility services focus mostly on pregnancy rates, but this research shows us there is a definite role of infertility care beyond achieving pregnancy," says Dr. Dyer. "Not everyone is going to conceive, and not everyone will ultimately be able to access the kind of therapy they want. So, particularly in communities like ours, there is a separate aim. And that is providing information, counseling, and empathy."

Kerry L. Wright

References

1 Program for Appropriate Technology in Health (PATH). Infertility. Overview/lessons learned. *Reproductive Health Outlook* 2002. Available: *http://www.rho.org/html/infertility.htm*.

2 Khaliwal LK, Khera KR, Dhali GI. Evaluation and two-year follow-up of 455 infertile couples — pregnancy rate and outcome. *Int J Fertil* 1991;36(4):222-26.

3 Collins JA, Wrixon W, Janes LB. Treatment-independent pregnancy among infertile couples. *N Engl J Med* 1983;309(20):1201-6.

4 Snick HK, Snick TS, Evers JL, et al. The spontaneous pregnancy prognosis in untreated subfertile couples: the Walcheren primary care study. *Hum Reprod* 1997;12(7):1582-88.

5 Program for Appropriate Technology in Health (PATH). Infertility in developing countries. *Outlook* 1997;15(3):1-6; Mascie-Taylor CGN. Endemic disease, nutrition and fertility in developing countries. *J Biosoc Sci* 1992;24(3): 355-65; Hassan MA, Killick SR. Effect of male age on fertility: evidence for the decline in male fertility with increasing age. *Fertil Steril* 2003;79(Suppl 3):1520-27.

6 Cates W, Farley TM, Rowe PJ. Worldwide patterns of infertility: is Africa different? *Lancet* 1985;2(8455):596-98.

7 World Health Organization. Infections, pregnancies, and infertility: perspectives on prevention. *Fertil Steril* 1987;47(6):964-68.

8 Cates W Jr, Rolfs RT, Aral SO. Sexually transmitted diseases, pelvic inflammatory disease, and infertility: an epidemiological update. *Epidemiol Rev* 1990;12:219-20.

9 World Health Organization.

10 McFalls JA, McFalls MH. *Disease and Fertility*. London, England: Academic Press, 1984.

11 Papreen N, Sharma A, Sabin K, et al. Living with infertility: experiences among urban slum populations in Bangladesh. *Reprod Health Matters* 2000;8(15):33-44.

12 Inhorn MC. Global infertility and the globalization of new reproductive technologies: illustrations from Egypt. *Soc Sci Med* 2003;56(9): 1837-51; Okonofua F. The case against new reproductive technologies in developing countries. *Br J Obstet Gynaecol* 1996;103(10):957-62.

13 Richards SC. "Spoiling the womb": definitions, aetiologies and responses to infertility in North West Province, Cameroon. *Afr J Reprod Health* 2002;6(1):84-94.

14 Okonofua FE, Harris D, Odebiyi A, et al. The social meaning of infertility in southwest Nigeria. *Health Transit Rev* 1997;7(2):205-20.

15 Stanback J, Twum-Baah KA. Why do family planning providers restrict access to services? An examination in Ghana. *Int Fam Plann Perspect* 2001;27(1):37-41.

16 Huggins GR, Cullins VE. Fertility after contraception or abortion. *Fertil Steril* 1990;50(5): 451-60; Hatcher RA, Trussell J, Stewart F, et al. *Contraceptive Technology, Seventeenth Revised Edition*. New York, NY: Ardent Media, Inc., 1998.

17 Papreen; Okonofua; Dyer SJ, Abrahams N, Hoffman M, et al. "Men leave me as I cannot have children": women's experiences with involuntary childlessness. *Hum Reprod* 2002;17(6):1663-68; Gerrits T. Social and cultural aspects of infertility in Mozambique. *Patient Educ Couns* 1997;31(1):39-48.

18 Gerrits.

19 Dyer SJ, Abrahams N, Hoffman M, et al. Infertility in South Africa: women's reproductive health knowledge and treatment-seeking behavior for involuntary childlessness. *Hum Reprod* 2000;17(6):1657-62.

Preserving **Fertility**

An underappreciated aspect of sexual health.

By Willard Cates, Jr., MD, MPH
President, Institute for Family Health, Family Health International

Dr. Cates is an epidemiologist whose public health career has focused on reproductive health and STIs, including HIV. Before joining FHI in 1994, he headed the Division of STD/HIV Prevention at the U.S. Centers for Disease Control and Prevention for a decade. He recently received the Thomas Parran Award at the 2003 International Society for Sexually Transmitted Diseases Research Congress in Ottawa, Canada. The award recognizes lifetime achievement in the field of STI research.

KEY MESSAGES

- STIs are the primary preventable causes of infertility.
- Chlamydial infection and gonorrhea are the two STIs most clearly associated with infertility.
- Screening can identify these two often-silent, fertility-threatening STIs.

Because family planning professionals devote much of their careers to trying to help clients avoid unintended pregnancies, they may neglect the issue of unintended *infertility*. But efforts to better prevent, diagnose, and treat the main causes of unintended infertility could help preserve the fertility of millions worldwide.

The main preventable causes of infertility are sexually transmitted infections (STIs), primarily chlamydial infection and gonorrhea (see article, page 12). Because these widespread and easily transmitted infections are often "silent" or asymptomatic, active screening of sexually active persons for these particular STIs is crucial. Otherwise, few women will realize that they have a fertility-threatening infection until they try to become pregnant and are unable to do so. Notably, this "prevention-first" approach to preserving fertility involves achieving the still difficult goal of integrating sexual and reproductive health services to address both unintended pregnancy and STIs.[1]

Chlamydial infection and gonorrhea first attack the inner lining of the cervix, then — if untreated — can ascend to the upper genital tract. They do so by moving through the uterus to the fallopian tubes, and in some women, to the ovaries and abdominal cavity. Infection of the uterus, fallopian tubes, or ovaries — called pelvic inflammatory disease (PID) — can cause infertility by either blocking or damaging the fallopian tubes. In long-term follow-up studies in Sweden, 11 percent of 1,309 women with documented acute PID who attempted to conceive were unable to do so because of confirmed post-PID tubal blockage.[2]

Several factors affect the likelihood that PID will result in tubal infertility. The long-term studies conducted in Sweden found that women's risk of infertility increased with each episode of PID: the risk of infertility with one PID episode was 8 percent; with two, 19 percent; and with three or more, 40 percent. The risk of infertility increased directly with the observed severity of tubal inflammation.[3] In addition, delays in seeking health care after pelvic symptoms occur can affect future fertility. In the Swedish studies, women who waited more than three days from the onset of their symptoms to seek medical help — giving inflammation more time to cause damage — had three times the risk of impaired fertility or ectopic pregnancy (outside the uterus) than did women who promptly sought care.[4]

Preventing tubal infertility

Preventing STI-related tubal infertility can occur at two levels. Men and women can achieve primary prevention to block acquisition of infection by delaying initiation of sexual intercourse, choosing an uninfected sexual partner, and — if neither of these conditions is met — using condoms to reduce the risks of chlamydial infection and gonorrhea. Secondary prevention, intended to block progression of lower genital tract infection to the upper genital tract, emphasizes STI screening, partner notification, and treatment. Treating "endstage" tubal infertility is very costly; thus, preventing the condition is imperative.

The secondary prevention approach of screening for STIs can be problematic in many developing-world settings where diagnostic laboratory tests are unavailable

The Most Easily Transmitted STIs

Both chlamydial infection and gonorrhea are widespread globally: 92 million cases of genital chlamydial infection and 62 million cases of gonorrhea occur among adults each year.[1] They are also among the most easily transmitted STIs. About one in every five unprotected sexual acts by someone with chlamydial infection will result in transmission to an uninfected partner. For gonorrhea, the risks of transmission are even higher: about one of every two exposed individuals will be infected.[2] Consistent and correct condom use can reduce the risk of transmitting these infections. However, because condoms can slip or break, they do not provide absolute protection. The only way to absolutely prevent transmission of STIs, and thus preserve fertility, is to delay or abstain from sexual intercourse or be sexually active only in a monogamous relationship with an uninfected individual.

References

1 World Health Organization. Department of HIV/AIDS. Chlamydia. In *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections. Overview and Estimates*. Geneva, Switzerland: World Health Organization, 2001. Available: *http://www.who.int/docstore/hiv/GRSTI/003.htm.*

2 Anderson RM. Transmission dynamics of sexually transmitted infections. In Holmes KK, Sparling PF, Märdh P-A, eds. *Sexually Transmitted Diseases.* (New York: McGraw-Hill, 1999)25-37.

or too costly. In the past, authorities have recommended that providers use simple algorithms based on symptoms as a tool to detect symptomatic STIs. While the algorithms for genital ulcers and male urethral discharge (urethritis) have proven useful, this syndromic approach to female vaginal discharge has been less specific for cervical gonorrhea and chlamydial infections. Use of other risk assessment algorithms to predict more accurately who is infected has been helpful in some settings, but these tools are still being developed.[5] The STI tests available in resource-poor settings — such as gram staining or gonorrhea culturing — tend to have problems in sensitivity or specimen storage.

However, secondary prevention for STIs is growing easier and more reliable as nucleic acid amplification tests become available in the developed world for routine use in clinics, public health programs, in the field, and even at home.[6] Although still too costly and complex for routine use in the developing world, the amplification tests have been used successfully for research projects there. Three unique characteristics of these tests make them important tools: 1) their improved sensitivity; 2) the ability to conveniently collect specimens using urine samples, client-collected tampons, or vaginal swabs (rather than endocervical or urethral swabs); and 3) their ability to simultaneously test for multiple organisms. Furthermore, the characteristics of these tests make them accessible to individuals who could not be readily tested with previous techniques. For example, outreach programs can now provide STI testing in settings where women do not undergo pelvic examinations or where men do not have urethral swabs collected.[7] Expanded efforts to screen asymptomatic young women, using self-collected vaginal swabs or first-void urine samples (the first part of the urine stream), have included high school-based testing, testing of both male and female military recruits, and testing in adolescent clinics and emergency departments.[8]

Meanwhile, rapid, easy-to-read, low-cost tests for gonorrhea and chlamydial infection are being developed by the Seattle-based Program for Appropriate Technology in Health (PATH), with support from the U.S. Agency for International Development, the United Nations Population Fund, and the Bill & Melinda Gates Foundation. These immunochromatographic (IC) strip tests can be used without running water or laboratory equipment and will allow screening of specimens from clients in rural or smaller clinics or hospitals in the developing world and other resource-limited settings. Accurate results will be available within 20 minutes, allowing for effective client follow-up, additional counseling, and prescription of drugs, if needed.[9] The IC strip tests may be commercially available within a year or two.

Screening young women for chlamydia will, over time, decrease the prevalence of chlamydial infection and the occurrence of PID in a given population.[10] For example, a randomized intervention trial of screening versus nonscreening among young women in a large health maintenance organization demonstrated substantial reduction in subsequent incidence of PID among those screened.[11] Before nucleic acid amplification tests were available, nearly all recommendations for chlamydia screening focused on women. Now, however, chlamydia screening in young men is possible, and it has several potential advantages (see article, page 13).

Blocking progression of lower genital tract infection to the upper genital tract or progression of upper genital tract infection to tubal obstruction involves treatment of STIs. Treatment recommendations for the curable STIs are updated regularly by the U.S. Centers for Disease Control and Prevention and the World Health Organization (see table, page 11). Many patients find it easier to comply with single-dose treatment regimens for chlamydial infection or gonorrhea, but multi-dose options are equally effective and less expensive. Making sure all sexual partners are treated with the same antibiotics helps prevent reinfections. Providers are increasingly giving STI-infected clients prescriptions for treatment of their partners' STIs.

A woman who has had one STI is at increased risk of reinfection, even after successful treatment. This is either because her sex partner or partners may not have been treated or because she may continue having intercourse within a high-prevalence sexual network. Thus, rescreening all women with documented gonorrhea or chlamydial infection three months after treatment is a high priority.[12] Since repeated infection can double PID risk, this retesting policy also helps prevent infertility. ■

STI Treatment Guidelines

If detected early, fertility-threatening chlamydial infection and gonorrhea are easily treatable with antimicrobial drugs available throughout the world. The following treatment regimens for nonpregnant adults are recommended by the U.S. Centers for Disease Control and Prevention and/or the World Health Organization.

Regimen	Uncomplicated Chlamydial Anogenital Infections	Uncomplicated Gonococcal Anogenital Infections
Recommended	**Doxycycline** 100 mg orally twice a day for 7 days; *or* **Azithromycin** 1 g orally in a single dose.	**Ciprofloxacin*** 500 mg orally in a single dose; *or* **Azithromycin** 2 g orally in a single dose; *or* **Ofloxacin*** 400 mg orally in a single dose; *or* **Levofloxacin*** 250 mg orally in a single dose; *or* **Ceftriaxone** 125 mg intramuscular (IM) injection, in a single dose. *Plus, if chlamydial infection is not ruled out, provide concurrent treatment for co-infection.*
Alternative	**Erythromycin base** 500 mg orally 4 times a day for 7 days; *or* **Erythromycin ethylsuccinate** 800 mg orally 4 times a day for 7 days; *or* **Ofloxacin** 300 mg orally twice a day for 7 days; *or* **Levofloxacin** 500 mg orally once a day for 7 days; *or* **Amoxicillin** 500 mg orally 3 times a day for 7 days; *or* **Tetracycline** 500 mg orally 4 times a day for 7 days.	**Spectinomycin** 2 g IM in a single dose. Spectinomycin is highly effective and useful for patients who cannot tolerate cephalosporins and quinolones. *or* **Single-dose cephalosporin** regimens (other than ceftriaxone 125 mg IM) include ceftizoxime (500 mg IM), cefoxitin (2 g IM with probenecid 1 g orally), and cefotaxime (500 mg IM). None of the injectable cephalosporins offers any advantage to ceftriaxone. *or* **Single-dose quinolone*** regimens include gatifloxacin 400 mg orally, norfloxacin 800 mg orally, and lomefloxacin 400 mg orally. None of these regimens appears to offer any advantage over ciprofloxacin, ofloxacin, or levofloxacin. *or* **Kanamycin**, 2 g in a single IM dose; *or* **Trimethoprim** (80 mg)/sulfamethoxazole (400 mg), 10 tablets orally, as a single dose daily for 3 days. Both should be used only where *in vitro* resistance rates are low and monitored regularly.

*Quinolones should not be used for gonorrhea acquired in Asia or the Pacific, including Hawaii, due to the prevalence of quinolone-resistant gonorrhea in these areas.

Sources: U.S. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines 2002. *MMWR* 2002;51(RR-6):33,37. Available: *http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5106a1.htm*; World Health Organization. *Guidelines for the Management of Sexually Transmitted Infections.* 2001. Available: *http://www.who.int/docstore/hiv/STIManagemntguidelines/who_hiv_aids_2001.01/index.htm.*

References

1 Mayhew S. Integrating MCH/FP and STD/HIV services: current debates and future directions. *Health Policy Plan* 1996;11(4):339-53; Shelton JD. Prevention first: a three-pronged strategy to integrate family planning program efforts against HIV and sexually transmitted infections. *Int Fam Plann Perspect* 1999;25(3):147-52.

2 Weström L, Joesoef R, Reynolds G, et al. Pelvic inflammatory disease and fertility. A cohort study of 1,844 women with laparoscopically verified disease and 657 control women with normal laparoscopic results. *Sex Transm Dis* 1992;19(4):185-92.

3 Weström.

4 Hillis SD, Joesoef R, Marchbanks PA, et al. Delayed care of pelvic inflammatory disease as a risk factor for impaired fertility. *Am J Obstet Gynecol* 1993;168(5):1503-9.

5 Cates W Jr, Welsh MJ. STD risk assessment in family planning settings: can we find clinically useful surrogates of infection? *IPPF Med Bull* 2003;37(3):1-2.

6 Andersen B, Olesen F, Møller JK, et al. Population-based strategies for outreach screening of urogenital *Chlamydia trachomatis* infections: a randomized, controlled trial. *J Infect Dis* 2002;185(2):252-58.

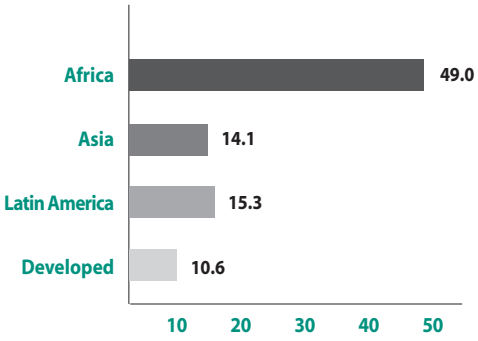
7 Stamm WE. Expanding efforts to prevent chlamydial infection. *N Engl J Med* 1998; 339(11):768-70; Stamm WE. *Chlamydia trachomatis* — the persistent pathogen. *Sex Transm Dis* 2001;28(12):684-89.

8 Cohen DA, Nsuami M, Etame RB, et al. A school-based chlamydia control program using

Global Trends Confirm STI–Tubal Infertility Link

In areas of the world where gonorrhea and chlamydial infection are more common, infertility due to blocked fallopian tubes is also more common.[1] The geographic association of gonorrhea is most strongly linked with infertility,[2] but the role of chlamydial infection in causing tubal infertility has been more exhaustively studied.

Percentage of Infertile Women with Bilateral Tubal Occlusion (by region)



Source: World Health Organization. Infections, pregnancies, and infertility: perspectives on prevention. *Fertil Steril* 1987;47(6):966.

Investigators from more than 25 different cities around the world have documented that tubal occlusion is strongly associated with evidence of past chlamydial infection. When these studies are combined, approximately 70 percent of women with tubal infertility, versus 26 percent of women without tubal infertility, had antibodies to chlamydia.[3] Chlamydial infection is particularly worrisome because it causes relatively benign symptoms and signs, yet apparently causes as much tubal inflammation — and ultimately tubal damage — as other infections such as gonorrhea or those caused by anaerobic organisms.

Globally, a World Health Organization multicenter study has compared infection-related infertility among couples in four different regions of the world. More than 5,800 infertile women in the study had their fallopian tubes evaluated. The study found the prevalence of tubal occlusion in Africa to be more than three times that of Asia, Latin America, or the developed world (see table above) and that two of every three African women with a history of a sexually transmitted infection (STI) had both tubes blocked.[4] The higher prevalence of past STIs and pregnancy complications among infertile African women than among infertile women from other regions appears to explain this finding.[5]

References

1 Sciarra JJ. Sexually transmitted diseases: global importance. *Int J Gynecol Obstet* 1997;58(1):107-19; Cates W, Farley TM, Rowe PJ. Worldwide patterns of infertility: is Africa different? *Lancet* 1985;2(8455):596-98.

2 Griffith HB. Gonorrhea and fertility in Uganda. *Eugen Rev* 1963;55(2):103; Arya OP, Nsanzumuhire H, Taber SR. Clinical, cultural, and demographic aspects of gonorrhoeae in a rural community in Uganda. *Bull WHO* 1973;49(6):587-95; Arya OP, Taber SR, Nsanze H. Gonorrhea and female infertility in rural Uganda. *Am J Obstet Gynecol* 1980;138(7Pt2):929-32.

3 Cates W Jr, Wasserheit JN. Genital chlamydial infections: epidemiology and reproductive sequelae. *Am J Obstet Gynecol* 1991;164(6 Pt 2):1771-81.

4 World Health Organization. Infections, pregnancies, and infertility: perspectives on prevention. *Fertil Steril* 1987;47(6):964-68; Cates, Farley, Rowe.

5 Cates, Farley, Rowe.

DNA amplification technology. *Pediatrics* 1998;101(1):E1; McKay L, Clery H, Carrick-Anderson K, et al. Genital *Chlamydia trachomatis* infection in a subgroup of young men in the UK. *Lancet* 2003;361(9371):1792; Gaydos CA, Howell MR, Quinn TC, et al. Sustained high prevalence of *Chlamydia trachomatis* infections in female army recruits. *Sex Transm Dis* 2003;30(7):539-44; Oh MK, Richey CM, Pate MS, et al. High prevalence of *Chlamydia trachomatis* infections in adolescent females not having pelvic examinations: utility of PCR-based urine screening in urban adolescent clinic setting. *J Adolesc Health* 1997;21(2):80-86; Moens V, Baruch G, Fearon P. Opportunistic screening for *Chlamydia* at a community based contraceptive service for young people. *BMJ* 2003; 326(7401):1252-55; Aldeen T, Haghdoost A, Hay P. Urine based screening for asymptomatic/undiagnosed genital chlamydial infection in young people visiting the accident and emergency department is feasible, acceptable, and can be epidemiologically helpful. *Sex Transm Infect* 2003:79(3):229-33.

9 Program for Appropriate Technology in Health (PATH). IC strip test for chlamydia. *HealthTech Update* May 2003. Available: *http://www.path.org/files/htup-IC_striptest_Chlamydia.pdf*; Program for Appropriate Technology in Health (PATH). IC strip test for gonorrhea. *HealthTech Update* May 2003. Available: *http://www.path.org/files/htup-IC_striptest_Gonorrhea.pdf*.

10 Nelson HD, Helfand M. Screening for chlamydial infection. *Am J Prev Med* 2001; 20(3 Suppl):95-107; Kamwendo F, Forslin L, Bodin L, et al. Decreasing incidences of gonorrhea- and chlamydia-associated acute pelvic inflammatory disease: a 25-year study from an urban area of central Sweden. *Sex Transm Dis* 1996;23(5):384-91.

11 Scholes D, Stergachis A, Heidrich DM, et al. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. *N Engl J Med* 1996;334(21):1362-66.

12 U.S. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines 2002. *MMWR* 2002; 51(RR-6):33. Available: *http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5106a1.htm*; Golden MR, Handsfield HH. Rescreening for chlamydial infection and gonorrhea. *Medscape Infect Dis* 2003;5(2).

Should Men Be Screened for Chlamydia?

Screening asymptomic young men for chlamydia is emerging as a possible strategy to protect their female sexual partners from this fertility-threatening infection. Screening men is now feasible because chlamydial infection can be detected using new tests on first-void urine specimens (the first part of the urine stream) rather than uncomfortable urethral swabs. Furthermore, these new tests — called nucleic acid amplification tests — are highly accurate and can be performed outside of clinic settings, offering opportunities for widespread use.

Some experts argue that all sexually active men ages 18 to 25 years should be offered such screening. This is necessary, they say, because adolescent and young adult men are more likely than older men to acquire the infection, which is often "silent." Up to three-quarters of infected men in the general population do not report any signs or symptoms.[1] Worldwide, some 92 million new chlamydial infections occur each year,[2] and up to 40 percent of women with untreated chlamydial infection develop pelvic inflammatory disease (PID).[3] PID, in turn, increases the risks of ectopic pregnancy (outside of the uterus) and infertility. Identifying chlamydial infection (through screening), then treating infected men would likely lower the risk that women will be infected and develop PID, just as screening women for chlamydia has been shown in two randomized controlled trials to at least halve their risk of developing PID.[4]

Acceptability studies have shown that about a third of men would participate in community-based screening for chlamydia.[5] If a third of men indeed participated, "there would be a dramatic impact," says Dr. Lars Ostergaard, chief physician in the Department of Infectious Diseases at Aarhus University Hospital in Denmark. Dr. Ostergaard has conducted research to develop new molecular techniques for diagnosing chlamydial infection and ways to use them in clinical practice. Recently, he has focused on the public health impact of using home-sampling strategies to screen for chlamydia.

Widespread screening of asymptomatic sexually active men, however, may entail prohibitive social, psychological, and economic costs. Stigmatization may occur,[6] and Dr. Ostergaard says his research has shown that "men's ethnicity and religion may reduce their acceptance of the screening test." Although screening men can be cost-effective in some settings, it may cease to be so if the prevalence of infection is low in a population. "One would need to begin screening slowly, because cost factors vary markedly from one setting to another," he says.

Given these potential problems, experts tend to agree that more effective screening of women, especially in settings with limited resources, may be a better course to take for the short term. In 2001, the U.S. Preventive Services Task Force issued evidence-based recommendations calling for chlamydia screening for all sexually active women younger than 26 years and for all women at increased risk of infection (for example, those who have a new sexual partner and those with multiple sexual


BERYL GOLDBERG

▲ ***Experts recommend better chlamydia screening among sexually active women who are young or at risk for this fertility-threatening infection. Screening sexually active young men and treating those who are infected may further reduce infection among women. Here, adolescent and young adult men congregate in Santo Domingo, Dominican Republic.***

partners).[7] The U.S. Centers for Disease Control and Prevention issued similar recommendations in 2002.[8] "Until we have successfully implemented screening in most high-risk women, we should wait to do widespread screening of men," says Dr. Walter Stamm, professor of medicine and head of infectious diseases at the University of Washington in Seattle. Dr. Stamm has conducted research to develop and evaluate new molecular diagnostic tests for chlamydial infection and to determine the impact of chlamydia screening on PID prevention.

Clearly, many women are not screened. A study conducted between 1996 and 1999 of some 23,000 female army recruits throughout the United States showed that many infected women had "fallen through the cracks," Dr. Stamm says. The prevalence of chlamydial infection in this population ranged from nearly 6 percent in the West to 12 percent in the South.[9] Low rates of screening among sexually active female adolescents — who are generally at greater risk of chlamydial infection than are older women — have been observed,[10] as well as high rates of reinfection among inner-city adolescent girls.[11]

"Since most women are not screened and even those who are tested and treated have a high recurrence rate," says Dr. Stamm, "we should concentrate on wider, community-based screening of women and subsequent rescreening, especially in settings with limited resources. Meanwhile, we should continue studies of the feasibility and effectiveness of screening in men."

Dr. Stamm emphasizes that screening men for chlamydia is designed to benefit women, not men themselves. The adverse consequences of this infection for men are low, with epididymitis (inflammation of the tubes through which sperm move from the testes to the *vasa deferentia*) developing in only one of every 100 infected men. Considering all the potential barriers to widespread, community-based chlamydia screening in sexually active men — including problems of access, acceptability, unclear screening criteria, and unclear criteria for follow-up screening and partner management — "we should instead pay more attention to expanded screening of women," he says, "and only then consider how efforts to screen men might fit into the approach of improving screening of women."

Kim Best

References

1 Farley TA, Cohen DA, Elkins W. Asymptomatic sexually transmitted diseases: the case for screening. *Prev Med* 2003;36(4):502-9.

2 World Health Organization. Department of HIV/AIDS. Chlamydia. In *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections. Overview and Estimates.* Geneva, Switzerland: World Health Organization, 2001. Available: *http://www.who.int/docstore/hiv/GRSTI/003.htm.*

3 U.S. Centers for Disease Control and Prevention. Division of Sexually Transmitted Diseases. Chlamydia Disease Information, 2001. Available: *http://www.cdc.gov/nchstp/dstd/Fact_Sheets/FactsChlamydiaInfo.htm.*

4 Scholes D, Stergachis A, Heidrich FE, et al. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. *N Engl J Med* 1996;334(21):1362-66; Ostergaard L, Andersen B, Moller JK, et al. Home sampling versus conventional swab sampling for screening of *Chlamydia trachomatis* in women: a cluster-randomized 1-year follow-up study. *Clin Infect Dis* 2000;31(4):951-57.

5 Bloomfield PJ, Kent C, Campbell D, et al. Community-based chlamydia and gonorrhea screening through the United States mail, San Francisco. *Sex Transm Dis* 2002;29(5):194-97; Stephenson J, Carder C, Copas A, et al. Home screening for chlamydial genital infection: is it acceptable to young men and women? *Sex Transm Infect* 2000;76(1):25-27.

6 Andersen B, Kangas I, Olesen F, et al. Psychosocial consequences of *Chlamydia trachomatis* testing [poster presentation]. *The 2003 International Society for Sexually Transmitted Diseases Research Congress*, Ottawa, Canada, July 27-30, 2003.

7 U.S. Preventive Services Task Force. Screening for chlamydial infection: recommendations and rationale. *Am J Prev Med* 2001;20(3S):90-94. Available: *http://www.ahrq.gov/clinic/ajpmsuppl/chlarr.htm#source.*

8 U.S. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines 2002. *MMWR* 2002;51(RR-6):32. Available: *http://www.cdc.gov/std/treatment/rr5106.pdf.*

9 Gaydos CA, Howell MR, Quinn TC, et al. Sustained high prevalence of *Chlamydia trachomatis* infections in female army recruits. *Sex Transm Dis* 2003;30(7):539-44.

10 Cook RL, Wiesenfeld HC, Ashton MR, et al. Barriers to screening sexually active adolescent women for chlamydia: a survey of primary care physicians. *J Adolesc Health* 2001;28(3):204-10.

11 Oh MK, Cloud GA, Fleenor M, et al. Risk for gonococcal and chlamydial cervicitis in adolescent females: incidence and recurrence in a prospective cohort study. *J Adolesc Health* 1996;18(4):270-75.

Triple Protection Addresses Unplanned Pregnancy, Infections, and Infertility

Many family planning providers have begun to counsel clients who are at risk of both unplanned pregnancy and sexually transmitted infections (STIs) about dual protection against both conditions.

But rather than dual protection, what many young women need is "triple protection" against unplanned pregnancy, STIs, and infertility, says Martha Brady, an associate with the New York-based Population Council's Gender, Family and Development Program.

Dual protection can be achieved by abstaining from sexual intercourse, by using contraception and having mutually monogamous intercourse with an uninfected partner, or by using condoms consistently, either alone or with another more effective method of contraception. (If a condom is used alone and fails, emergency contraception can serve as a backup contraceptive method but will not protect against STIs.) Brady points out that each of the dual protective measures also helps women preserve their fertility by preventing STIs that can lead to infertility without prompt, effective treatment.

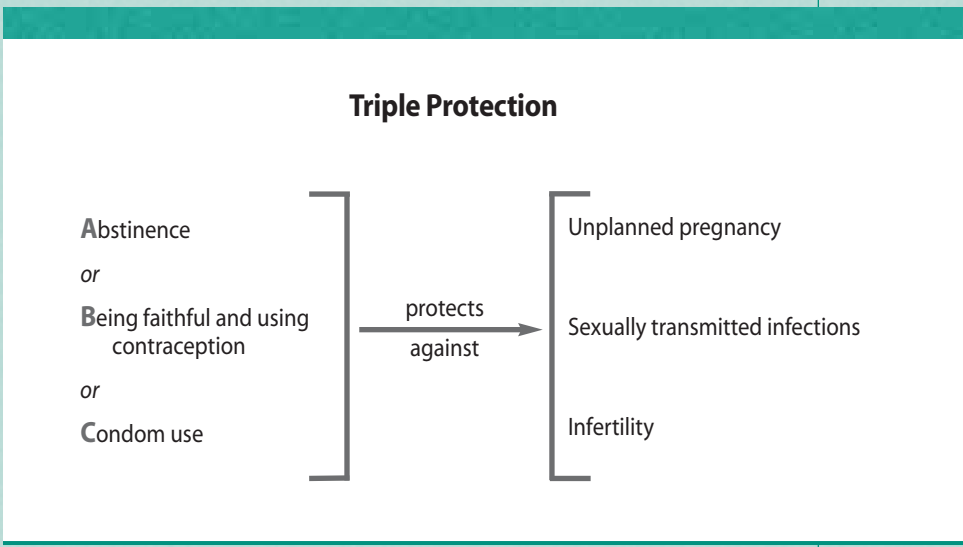
Adding infertility prevention to the dual protection message would focus attention on the neglected public health problem of infertility, while potentially strengthening family planning and STI prevention efforts, Brady argues in a recent article in the journal *Reproductive Health Matters*.[1] "Expansion of the message to encompass triple protection could use the visibility of fertility and infertility — and people's immediate connection with the issue — to promote protection against STIs and HIV," she writes. "Linking safer sex to fertility, rather than disease prevention per se, also might destigmatize the issues around STIs and HIV," Brady says.

Promoting ways to simultaneously protect against both unplanned pregnancies and STIs has proved challenging. This dual protection message is more complicated than focusing on only preventing unplanned pregnancies or only preventing STIs. Some reproductive health experts fear that adding a third message about preventing infertility might make the task even more difficult.

Brady acknowledges this challenge. "But adding this message about preventing infertility is important, particularly for young women," she says. "The same methods that offer dual protection also offer the possibility of triple protection, so only the message needs to change. It is a conceptual shift, rather than a new program."

Furthermore, this conceptual shift offers opportunities for more holistic approaches to reproductive health, Brady notes. By preventing and even treating infertility, for example, family planning programs could help both women and men with fertility problems, involve men in protecting reproductive health, and win the trust of their communities, while reducing STI rates and unplanned pregnancies.

Kathleen Henry Shears



Reference

1 Brady M. Preventing sexually transmitted infections and unintended pregnancy, and safeguarding fertility: triple protection needs of young women. *Reprod Health Matters* 2003;11(22):134-41.

Programs Begin to Emphasize STI, Infertility Link

Many people are unaware that lack of treatment or improper treatment of sexually transmitted infections (STIs) — particularly among women — is a major cause of infertility in developing countries.[1]

So, some family planning programs are emphasizing the link between STIs and infertility as they begin to offer more comprehensive reproductive health services, including infertility prevention and treatment. For example, the Family Planning Association of India's Comprehensive Reproductive Health for All project provides education and counseling about STIs to its clients, including men attending its infertility clinic or male reproductive health clinic (see article, page 19). Preserving fertility through STI prevention and treatment is an important theme in the program's community outreach efforts through village-level groups for women and men.[2]

▲ *Pedestrians and vehicles navigate a busy street in Delhi, India.*

Also attempting to increase awareness of the link between STIs and infertility is the Women's Health and Research Action Centre, a nongovernmental organization based in Benin City, Nigeria. The center's staff members hold community forums and appear on television and radio programs to educate people about the need for STI prevention and treatment to preserve fertility.

The center in Nigeria conducted a trial to evaluate an STI-prevention pilot program in schools. The pilot program, which included peer education, reproductive health clubs, and provider training to improve the quality of STI care for students, focused on preventing infertility. Researchers found statistically significant reductions in reported STI symptoms among students in four participating schools in Benin City, compared with students in eight local schools who did not receive this STI prevention information. The study also found significant improvements in knowledge of STIs and in partner notification and STI treatment-seeking behaviors among students in the intervention group.[3] The Women's Health and Research Action Centre subsequently has worked with communities to adapt the pilot program to reach out-of-school youth.

Dr. Friday Okonofua, executive director of the Centre, advocates early intervention to educate people about preserving their fertility through STI prevention and treatment. "Many people fear infertility," he says. "So, if we are able to tie STIs to information on infertility, these people will be much more receptive to our messages."

Kathleen Henry Shears

References

1 Dyer SJ, Abrahams N, Hoffman M, et al. Infertility in South Africa: women's reproductive health knowledge and treatment-seeking behavior for involuntary childlessness. *Hum Reprod* 2002; 17(6):1657-62; Passey M, Mgone CS, Lupiwa S, et al. Community based study of sexually transmitted diseases in rural women in the highlands of Papua New Guinea: prevalence and risk factors. *Sex Transm Infect* 1998;74(2):120-27.

2 Datta B. "What about us?" Bringing infertility into reproductive care. *Quality/Calidad/Qualité* 2002;13:3-29.

3 Okonofua FE, Coplan P, Collins S, et al. Impact of an intervention to improve treatment-seeking behaviour and prevent sexually transmitted diseases among Nigerian youths. *Int J Inf Dis* 2003; 7(1):61-73.

Men Contribute to and Suffer from **Infertility**

KEY MESSAGES

- Infertility affects men as well as women.
- Infertile men suffer stigmatization.
- Men can protect themselves and their partners from STIs and possible infertility by practicing abstinence, being faithful to one partner, or using condoms.

"Any man who has no children is considered a dead man."
— Second-century Talmud writings

When a couple cannot have children, the woman is usually blamed. However, men can be infertile, too — a situation that causes them embarrassment and disappointment.

Infertility affects about 8 percent to 12 percent of the world's population and — in about half of the cases — men are either the single cause of, or contribute to, the couple's infertility.[1]

Various myths exist about causes of male infertility. A survey of 120 residents of an urban slum area of Bangladesh, for example, found that male infertility was often attributed to God's will or psychological problems.[2] In Nigeria, some women and men correctly suggested in a study that sexually transmitted infections (STIs) can cause infertility, but others said male infertility was the result of eating sweet foods, having a small penis, or engaging in sexual intercourse with older women.[3]

However, true causes of male infertility are abnormal sperm production or sperm function, obstruction of the genital tract, or disorders of the sex organs.[4] Many of the root causes of male infertility, such as infectious and parasitic diseases or toxins (see table, page 4), are preventable. While research on the link between STIs and male infertility is conflicting, some studies suggest that gonorrhea or chlamydial infection can spread from the urethra to the epididymis, sometimes generating infections that block the sperm ducts or cause disorders in sperm production.[5]

The use of male condoms can reduce STI risks for men and — more importantly — for their partners, thus protecting fertility. Yet, many individuals incorrectly believe that condoms — as well as other contraceptives — cause permanent infertility. In Botswana, participants in a recent study said they did not want to use family planning methods because they thought the methods damage the body's immune and reproductive systems. "Contraception, condoms, pills, they all block the bloods. . . . For men, if the blood is blocked, he will not be able to have a child, and then people will think that he is sick. . . . What woman will want you if you are known to be sick, to not be able to give any woman child?"[6]

Men, attitudes, and risky behaviors

To protect themselves against STIs — and the possible consequences of infertility — men can practice sexual abstinence. Or, they can be faithful to one partner. The African Proverbs Project, which applies traditional wisdom to modern-life circumstances, has used the Kiswahili proverb "better a curtain hanging motionless [than] a flag blowing in the wind" to caution young people about the risks of having multiple sexual partners. Finally, using male condoms offers protection.

Ironically, in trying to prove their virility and fertility, some men may behave in ways that put them at greater risk of acquiring and transmitting fertility-threatening STIs.

An FHI study of youth ages 15 to 24 years in the Kakamega, Vihiga, and Bondo districts of Kenya found that young men saw sexual activity as a sign of manhood. Many young men reported that they had sexual intercourse to gain community recognition and to test their virility. Others said intercourse was essential to preserving fertility and health. "Most men say it is not right for a man to stay for one to two months without having sex. If there are too many sperms in the body, the man becomes shapeless or too fat. . . . If the sperms take too long in the body . . . one cannot make a woman pregnant because his sperms are expired," a young woman explained.[7]

Although study participants recognized the dangers of STIs, many said men were reluctant to use condoms to prevent infection because condoms also prevent pregnancy. "Young men usually compete over one girl. To win a girl, the man has to make her pregnant," one young man said.[8]

Studies conducted in other countries confirm that attitudes about what is natural or appropriate masculine behavior encourage men to be sexually active, often with little regard for the possible consequences of that activity. A study in Nigeria

found that nearly one-third of the 1,527 young men surveyed said they wanted to have sexual intercourse to feel like "real" men.[9] In Brazil, young men said they felt pressure from their fathers and friends to be sexually active.[10] A study of approximately 800 men in Latin America found that nearly one-fourth of men surveyed in Argentina, Cuba, and Peru said that men are incapable of saying no to sexual intercourse; more than half of the men surveyed in Bolivia gave the same response.[11] Research in Thailand and Haiti found that married men were expected to have affairs with girlfriends or prostitutes,[12] while research in Grenada and St. Lucia showed that having multiple sexual relationships was considered permissible for men.[13]

Expectations that men be virile and strong also may make them reluctant to seek treatment when they notice STI symptoms, such as urethral discharge or a burning sensation during urination.

Infertile men stigmatized

Men and women who cannot bear children often face terrible consequences, including loss of status within the family and community.

For women, infertility can be particularly cruel. Women may be ostracized in their families and communities, ridiculed by friends and neighbors, or abandoned or beaten by husbands. Infertile women may not be allowed to touch babies and may be feared as witches. Some women who have no children cannot inherit property and may find themselves without financial support in old age. They may be denied a proper burial. Among the Yoruba tribe in Nigeria, infertile women are called "agon," from a word that means to hold in contempt or to despise.[14] Even when male infertility is the reason a couple cannot have children, women may still face the threat of divorce.[15] In Bangladesh, remarriage often was suggested as a remedy for infertility in the family. "Whoever stays with an infertile wife, people call him bad," one man explained.[16]

Men who are infertile also face ridicule and stigmatization — although to a lesser degree than women. In some cultures, children are an indicator of a man's wealth and prosperity; men without children do not receive the same respect as fathers. In research conducted in Zimbabwe, some men said they were denied work because they did not have children or that they were excluded from leadership roles in their communities. Other men said their inability to father children brought shame to their extended family, and some men, determined to prove their fertility, had sexual intercourse with multiple partners hoping to impregnate one.[17]

Men who learn they are infertile may perceive themselves as less masculine. A small study of 36 couples in the United States found that men felt "disabled" or "emasculated" when they learned they were infertile. Some men described themselves as "losers."[18]

Yet, in some countries, men may never learn they are infertile. A participant in an Egyptian study explained, "Usually when it's [infertility] known to be from the husband, they don't tell him anything, because it would make him feel embarrassed, and his manhood would be shaken."[19]

Men who do recognize that they may be infertile may be reluctant to seek counseling about the condition. "Men do not want their personal lives to be known, especially when it comes to infertility problems," says Betty Chishava, the director of Chipo Chedu Trust, a nongovernmental organization in Zimbabwe that provides education and counseling about infertility and its consequences. "In Zimbabwean society, a man is recognized as a man only if he has some children. Without a child, men would think that after their death, no one will inherit their property and carry their name in the future."

Barbara Barnett

▲ ***Boys and young men, often expected and even encouraged by male relatives and peers to prove their manhood, may adopt sexual behaviors that put them and their sexual partners at risk for fertility-threatening infections. Here, two students bicycle through a school courtyard in Ouagadougou, Burkina Faso.***

continued on page 20

Helping Men Understand Infertility

Reproductive health programs and clinics can play an important role in helping men understand and prevent infertility. They may be able to:

- Educate men about the prevalence and causes of infertility. They can explain that infertility can affect men as well as women, and that preventing sexually transmitted infections (STIs) may be one of the best ways of preserving fertility.
- Challenge attitudes and customs that encourage men to prove their fertility and manhood through unsafe sexual behaviors.
- Counsel men about how to protect both their own fertility and that of their sexual partners by reducing risky sexual behaviors.
- Offer STI screening, when resources are available. Providers should encourage individuals with STIs to ask their partners to seek treatment as well.

Reproductive health programs and clinics may also be able to help men and their partners cope with infertility. Some can:

- Offer infertility information and counseling to infertile couples or make referrals to organizations that offer such services.
- Encourage both men and women to seek diagnoses and treatment for the condition. Diagnostic tests for men are less complex than those for women. And these tests can uncover reasons for infertility that may be easily treatable, such as low sperm counts due to excessive heat[1] or to diabetes.[2]
- If no treatment is available, counsel both men and women to help them accept their infertility.

BERYL GOLDBERG

▲ ***Family planning providers may have an opportunity to educate men about ways to prevent infertility, such as reducing risky sexual behaviors. In Bamako, Mali, a provider discusses family planning and other reproductive health matters with a male client.***

In India, the Comprehensive Reproductive Health for All project has a goal to "leave no man out" when screening and treating couples for infertility.[3] The program, administered by the Family Planning Association of India, offers a special reproductive health clinic for men that includes condom distribution, education, and counseling, as well as infertility screenings that include STI testing, semen analyses, blood tests for testosterone levels, and a physical examination. In addition, the program encourages men to accompany their wives who seek treatment for infertility.

In Zimbabwe, the nongovernmental organization Chipo Chedu Trust promotes income-generation projects to help infertile women and men earn enough money to pay for medical treatments, in addition to offering programs to educate the community about infertility.[4]

Betty Chishava, director of Chipo Chedu Trust, says it is important to educate men about infertility so that they can protect themselves and their partners from STIs. "Men are left out of infertility programs because the blame is always pointed to women," she says. "Reproductive health programs can encourage men to prevent STIs by organizing and conducting health education [efforts]. . . . Both [members of the] couple must seek treatment at the same time."

Chishava suggests infertility education efforts should begin early. "Since infertility is an ongoing thing, and the rate is always increasing, there is a need to impart the knowledge to school children. The education sector should write school books on infertility so as to encourage early treatment and to [help people] accept whatever has come across their lives."

Barbara Barnett

References

1 Datta B. "What about us?" Bringing infertility into reproductive health care. *Quality/Calidad/Qualité* 2002;13:3-29.

2 Gunaratne M. *Childlessness: The Laymans' Guide*. Peradeniya, Sri Lanka: University of Peradeniya, 1987.

3 Datta.

4 Cohen P. Overcoming the stigma of infertility in Zimbabwe. *Changemakers.net J* 2001. Available: *http://www.changemakers.net/journal/01june/sango.cfm*.

continued from page 18

References

1 Cates W, Farley TM, Rowe PJ. Worldwide patterns of infertility: is Africa different? *Lancet* 1985;2(8455):596-98; Program for Appropriate Technology in Health (PATH). Infertility. Overview/lessons learned. *Reproductive Health Outlook* 2002. Available: *http://www.rho.org/html/infertility.htm.*

2 Papreen N, Sharma A, Sabin K, et al. Living with infertility: experiences among urban slum populations in Bangladesh. *Reprod Health Matters* 2000;8(15):33-44.

3 Okonofua FE, Harris D, Obebiyi A, et al. The social meaning of infertility in southwest Nigeria. *Health Transit Rev* 1997;7(2):205-20.

4 International Planned Parenthood Federation. *IMAP Statement on Infertility*. London, UK: International Planned Parenthood Federation, 1995.

5 Berger RE. Acute epididymitis. In Holmes KK, Märdh P-A, Sparling PF, et al., eds. *Sexually Transmitted Diseases*. New York, NY: McGraw-Hill, 1990.

6 Upton RL. Perceptions of and attitudes towards male infertility in northern Botswana: some implications for family planning and AIDS prevention policies. *Afr J Reprod Health* 2002;6(3):103-11.

7 Family Health International. Dual protection study: formative research qualitative report. Unpublished paper. Family Health International, nd.

8 Family Health International.

9 Oladepo O, Brieger WR. Sexual attitudes and behaviors of male secondary school students in rural and urban areas of Oyo State, Nigeria. *Afr J Reprod Health* 2000;4(2):12-34.

10 Simonetti C, Simonetti V, Arruda S, et al. Listening to boys: a talk with ECOS staff. In Zeidenstein S, Moore K, eds. *Learning about Sexuality: A Practical Beginning*. (New York, NY: Population Council and International Women's Health Coalition, 1996)324-32.

11 Pantelides EA. Male involvement in prevention of pregnancy and HIV: results from research in four Latin American cities. *Programming for Male Involvement in Reproductive Health. Meeting of WHO Regional Advisers in Reproductive Health, Washington, DC, September 5-7, 2001*. Geneva, Switzerland: World Health Organization, 2002.

12 Tangchonlatip K, Ford N. Husbands' and wives' attitudes toward husbands' use of prostitutes in Thailand. In Ford N, Chamratrithirong A, eds. *UK/Thai Collaborative Research Development in Reproductive and Sexual Health: Proceedings of the Symposium on Mahidol-Exeter British Council Link*. (Nakornpathom, Thailand: Mahidol University, 1993)117-34; Ulin PR, Cayemittes M, Metellus E. *Haitian Women's Role in Sexual Decision-Making: The Gap between AIDS Knowledge and Behavior Change*. Research Triangle Park, NC: Family Health International, 1995.

13 Caribbean male: macho and insensitive? *IPPF/WHR Forum* 1991:31.

14 Pearce TO. She will not be listened to in public: perceptions among the Yoruba of infertility and childlessness in women. *Reprod Health Matters* 1999;7(13):69-78.

15 Inhorn MC. "The worms are weak": male infertility and patriarchal paradoxes in Egypt. *Men Masculinities* 2003;5(3):236-56.

16 Papreen.

17 Runganga AO, Sundby J, Aggleton P. Culture, identity, and reproductive failure in Zimbabwe. *Sexualities* 2001;4(3):315-32.

18 Nachtigall RD, Becker G, Wozny M. The effects of gender-specific diagnosis on men's and women's response to infertility. *Fertil Steril* 1992;57(1):113-21.

19 Inhorn.

NewsBriefs

continued from page 2

91-day regimen, rather than the 28-day regimen of most conventional OCs. With Seasonale, women take one active pill daily for 84 days (12 weeks) and then one placebo pill daily for seven days. This induces withdrawal bleeding only four times a year. In contrast, women who take most conventional OCs take one active pill daily for 21 days (three weeks), then one placebo pill daily for seven days. This induces withdrawal bleeding 13 times each year.

A one-year, multicenter, randomized trial from the United States, reported in the August 2003 issue of the journal *Contraception*, confirmed that Seasonale effectively prevents pregnancy and has a safety profile similar to that of comparable conventional OCs. Women who took Seasonale did report more breakthrough bleeding during the first few months of use than did women taking conventional OCs, but the new regimen was still well tolerated.

Possible but unproven benefits of extended-regimen OCs are greater protection against anemia than that provided by conventional OCs; increased effectiveness during typical use because of fewer pill-free intervals; and improved compliance for women who have difficulty returning to clinics or pharmacies for more pill packets. "A four-month supply of pills is built into the extended regimen, so the all-too-common practice of providing clients with only one cycle of pills at a time can be avoided," notes Dr. James D. Shelton, senior medical scientist at the U.S. Agency for International Development.

Because menstrual suppression reduces overall menstrual bleeding and associated pain and cramping, many health care providers already prescribe continuous OC use for women with severe menstrual problems. But because the long-term effects of menstrual suppression and of slightly higher levels of hormonal exposure are unknown, some researchers and providers are reluctant to recommend extended-regimen OCs to women with normal menstrual cycles. "Hopefully, over time, good evidence will emerge on all of these issues," Dr. Shelton says. ■

ClinicalChallenges

Pill 'Vacation' Unnecessary

A married 24-year-old woman who has been using oral contraceptives (OCs) for several months comes to the clinic for advice. She is happy with her choice of contraceptive method. However, she has heard that she needs to give her reproductive system a "vacation" from OC use, or else she may not be able to "reactivate" it later when she wants to have children. The young woman is thinking of not taking the pills for a while. What should she be counseled to do?

Since she is satisfied taking OCs, the woman should be advised to continue using them. Women do not need to periodically stop taking OCs to preserve fertility. Research has shown that contraceptive pills do not cause infertility,[1] regardless of duration of use.[2]

Return to fertility may be immediate after OC users stop taking the pills.[3] However, several studies have shown that OC users often experience a temporary delay in return to fertility. Generally, it takes a woman a few months longer to conceive after discontinuing OCs than it would have if she had not taken them.[4]

Taking a "vacation" from the pill would improve neither this woman's health nor her fertility. But it would increase her risk of unintended pregnancy if she had unprotected sexual intercourse or intercourse using a less effective contraceptive method during this time. Of note, use of OCs can protect against ectopic pregnancy[5] that could jeopardize long-term fertility.

Can Douching Threaten Fertility?

A 23-year-old sexually active, single woman wants to know whether regular vaginal douching is a good practice. Some of her friends and female family members have told her that douching can help protect her from acquiring sexually transmitted infections (STIs), but others have told her that it can be harmful and might even threaten her fertility. Based on the best research to date, should this practice be recommended?

Many women douche, believing that the practice is hygienic, healthy,[6] and even prevents STI transmission.[7] However, douching has not been shown to either protect against STIs or provide other health benefits. Furthermore, a recent cross-sectional analysis found that douching — particularly frequent or recent douching — for symptoms such as vaginal discharge or for hygiene was associated with bacterial vaginosis (BV), an overgrowth of unhealthy bacteria.[8] These findings confirm those of several cross-sectional studies[9] and a single, small prospective cohort study[10] that have shown an association between douching and BV. BV can cause fertility-threatening pelvic inflammatory disease (PID) if either gonorrhea or chlamydial infection is present. It can also harm a pregnancy. A recent meta-analysis of 18 studies involving some 20,000 patients has confirmed that BV, present early in pregnancy, is a strong risk factor for preterm delivery and spontaneous abortion.[11] How different douching products affect vaginal health has not been established yet. But, given growing concerns about the adverse health effects of douching, this practice should not be recommended.

Of note, some studies have suggested that douching is associated with cervical chlamydial infection and PID.[12] However, this association was not observed in the recent study that linked douching with BV. That study, conducted among 1,200 U.S. women at high risk for STIs, found no association between douching and either gonorrhea or chlamydial infection of the cervix.[13] Similarly, in a recent randomized study conducted among 1,827 women, the risk of PID for women assigned to use a newly designed douche product was only slightly greater or no greater than for those women assigned to use a cloth towel wipe.[14]

Vasectomy's Permanency Could Cause Regret

A 29-year-old man comes to the family planning clinic with his 25-year-old wife six months after the birth of their second child. They have been discussing their contraceptive options, and wonder whether vasectomy would be a good choice. Struggling financially, they doubt that they will ever be able to afford more children; thus, they are considering a permanent contraceptive method. Would vasectomy be advisable in this case?

Vasectomy is a good contraceptive for couples seeking a safe, effective, and permanent method. However, it may not be the best choice for a couple who, in reacting to immediate financial pressures, have not fully considered their ultimate reproductive goals. Since this couple wishes to delay fertility for an indefinite time, a long-acting method — such as the intrauterine device (IUD) — might be a better option.

Vasectomy involves a brief surgical procedure in which the *vasa deferentia* — the two tubes that carry sperm from the testicles to the penis — are interrupted so that sperm can no longer enter the semen. Although vasectomy failure may be more common than previously thought, recent evidence from Nepal still shows pregnancy rates of only 2 percent in the first year and 4 percent in the three years following the procedure.[15] New techniques such as cautery and fascial interposition may make vasectomy even more effective.[16]

Reversing a vasectomy is difficult, expensive, and has no guarantee of success, so it is important that providers counsel clients about the method's permanency.[17] To help clients make informed choices, provider-initiated counseling before vasectomy is performed should also include discussion of other long-term but reversible contraceptive options.[18] By exploring clients' feelings about ending fertility and their readiness for the procedure, providers can identify clients who have doubts or unrealistic expectations and those who have requested sterilization in response to short-term stresses or external pressure. These are all factors associated with post-operative regret. Young age at sterilization and changes in marital status are also common predictors of sterilization regret.[19]

Kathleen Henry Shears and Kim Best

References

1 Doll H, Vessey M, Painter R. Return of fertility in nulliparous women after discontinuation of the IUD: comparison with women discontinuing other methods of contraception. *Br J Obstet Gynaecol* 2001;108(3):304-14; Bracken MB, Hellenbrand KG, Holford TR. Conception delay after oral contraceptive use: the effect of estrogen dose. *Fertil Steril* 1990;53(1):21-27; Vessey MP, Smith MA, Yeates D. Return of fertility after discontinuation of oral contraceptives: influences of age and parity. *Br J Fam Plann* 1986;11(4):120-24.

2 Doll.

3 World Health Organization. *Improving Access to Quality Care in Family Planning. Medical Eligibility Criteria for Contraceptive Use*. Geneva, Switzerland: World Health Organization, 2000.

4 Spira A. Fertility following hormonal contraception. *Contracept Fertil Sex* 1983;11(7-8): 903-7; Linn S, Schoenbaum SC, Monson RR, et al. Delay in conception for former 'pill' users. *JAMA* 1982;247(5):629-32; Pardthaisong T, Gray RH. The return of fertility following discontinuation of oral contraceptives in Thailand. *Fertil Steril* 1981;35(5):532-34; Bracken MB, Hellenbrand KG, Holford TR. Conception delay after oral contraceptive use: the effect of estrogen dose. *Fertil Steril* 1990;53(1):21-27.

5 Ankum WM, Mol BWJ, Bussuyt PMM, et al. Contraception and the risk of ectopic pregnancy: a meta-analysis. *Contraception* 1995;52(6):337-41.

6 Ness RB, Hillier SL, Richter HE, et al. Why women douche and why they may or may not stop. *Sex Trans Dis* 2003;30(1):71-74; Oh MK, Funkhouser E, Simpson T, et el. Early onset of vaginal douching is associated with false beliefs and high-risk behavior. *Sex Transm Dis* 2003; 30(9):689-93.

7 Wilson TE, Uuskula A, Feldman J, et al. A case-control study of beliefs and behaviors associated with sexually transmitted disease occurrence in Estonia. *Sex Transm Dis* 2001; 28(11):624-29.

8 Ness RB, Hillier SL, Richter HE, et al. Douching in relation to bacterial vaginosis, lactobacilli, and facultative bacteria in the vagina. *Obstet Gynecol* 2002;100(4):765-72.

9 Royce RA, French JI, Savitz DA, et al. Vaginal douching, bacterial vaginosis, and preterm birth. *Congr Epidemiol Abstr* 2001;S161; Rajamanoharan S, Low N, Jones SB, et al. Bacterial vaginosis, ethnicity, and the use of genital cleaning agents: A case control study. *Sex Transm Dis* 1999;26(7):404-9; Fonck K, Kaul R, Keli F, et al. Sexually transmitted infections and vaginal douching in a population of female sex workers in Nairobi, Kenya. *Sex Transm Infect* 2001;77(4):271-75; Holzman C, Leventhal JM, Qiu H, et al. Factors linked to bacterial vaginosis in nonpregnant women. *Am J Public Health* 2001;91(10):1664-70.

10 Hawes SE, Hillier SL, Benedetti J, et al. Hydrogen peroxide-producing lactobacilli and acquisition of vaginal infections. *J Infect Dis* 1996;174(5):1058-63.

11 Leitich H, Bodner-Adler B, Brunbauer M, et al. Bacterial vaginosis as a risk factor for preterm delivery: a meta-analysis. *Am J Obstet Gynecol* 2003;189(1):139-47.

12 Stergachis A, Scholes D, Heidrich FE, et al. Selective screening for *Chlamydia trachomatis* infection in a primary care population of women. *Am J Epidemiol* 1993;138(3):143-53; Scholes D, Stergachis A, Ichikawa LE, et al. Vaginal douching as a risk factor for cervical *Chlamydia trachomatis* infection. *Obstet Gynecol* 1998;91(6):993-97; Wolner-Hanssen P, Eschenbach DA, Paavonen J, et al. Association between vaginal douching and acute pelvic inflammatory disease. *JAMA* 1990;263(14):1936-41; Beck-Sague CM, Farshy CE, Jackson TK, et al. Detection of *Chlamydia trachomatis* cervical infection by urine tests among adolescents clinics. *J Adolesc Health* 1998;22(3):197-204.

13 Ness, Hillier, Richter, 2002; Ness R, Richter H, Stamm C, et al. Does douching elevate the risk for incident gonococcal/chlamydial cervicitis and pelvic inflammatory disease (PID)? *The 2003 International Society for Sexually Transmitted Diseases Research Congress*, Ottawa, Canada, July 27-30, 2003.

14 Rothman KJ, Funch DP, Alfredson T, et al. Randomized field trial of vaginal douching, pelvic inflammatory disease and pregnancy. *Epidemiology* 2003;14(3):340-48.

15 Nazerali H, Thapa S, Hays M, et al. Vasectomy effectiveness in Nepal: a retrospective study. *Contraception* 2003;67(5):397-401.

16 Chen-Mok M, Bangdiwala SI, Dominik R, et al. Termination of a randomized controlled trial of two vasectomy techniques. *Control Clin Trials* 2003;24(1):78-84; Sokal D, Irsula B, Chen M, et al. A comparison of vas occlusion techniques: cautery vs. ligation and excision with fascial interposition. *Contraception* 2003;68(2): 143 [abstract #14].

17 Sandlow JI, Westefeld JS, Maples MR, et al. Psychological correlates of vasectomy. *Fertil Steril* 75(3):544-48; Sterilization. ACOG technical bulletin. *Int J Gynaecol Obstet* 1996; 53(3):281-88.

18 Burkman RT. Contraceptive sterilization: trends, options, and surprising new data. *Dialogues Contracept* 1997;5(2):5-7.

19 EngenderHealth. *Contraceptive Sterilization: Global Issues and Trends*. (New York, NY: EngenderHealth, 2002)8,126-28.

YouthLens

Abstinence, Fewer Partners, Condom Use Are Complementary Messages

The first phase of a major six-country study suggests that promotion of abstinence from sex to prevent HIV infection contributed to an approximately one-year delay of sexual initiation among youth in two countries — Uganda and Zambia — where HIV prevalence declined throughout the 1990s.[1] In both countries, delayed sexual initiation among youth, abstinence, and condom use with nonregular partners all contributed to declines in HIV prevalence. However, the study concluded, HIV declines were probably due primarily to both adolescents and adults having fewer sexual partners.

In Thailand, a third country where HIV prevalence declined, reductions in commercial sex and other nonmarital sexual relationships and increases in condom use during commercial sex likely contributed to the decline. This type of multifaceted behavior change did not occur to the same extent in the other three countries in the study — Cameroon, Kenya, and Zimbabwe — where HIV prevalence did not decline.

Thus, the "ABC strategy" (**a**bstinence, **b**e faithful to one partner or reduce number of partners, or — if "A" or "B" cannot be achieved — use **c**ondoms consistently and correctly) continues to be an appropriate general recommendation. And messages to delay sexual initiation or to begin practicing abstinence even after having been sexually active need to be an integral part of programs to prevent HIV, other sexually transmitted infections (STIs), and pregnancy among unmarried youth.

Delaying sexual initiation

Throughout the world, the age of puberty is falling while the age of marriage is generally rising. These factors result in a longer period during which unmarried youth can be sexually active, often in a series of monogamous relationships. In demographic and health surveys among 15- to 19-year-olds, more than 25 percent of boys in Brazil, Gabon, Haiti, Hungary, Kenya, Latvia, Malawi, Mozambique, and Nicaragua reported having had sexual intercourse before they were 15 years old. Generally, more than 15 percent of surveyed girls reported having had intercourse before age 15.[2]

For behavioral as well as physiological reasons, early sexual debut increases adolescents' risk for infection with HIV and other STIs. Youth who begin sexual activity early are more likely to have high-risk or multiple partners and are less likely to use condoms.[3]

Many factors affect the timing of sexual debut. A World Health Organization review of studies in 53 countries found common protective factors and risk factors throughout the world. Having positive relationships with parents and teachers, holding spiritual beliefs, and attending school were associated with a decreased likelihood of early sexual debut. In contrast, engaging in other hazardous behaviors and having sexually active friends were associated with an increased likelihood of early sexual debut.[4]

Delaying first sex or abstaining from sexual intercourse after having been sexually active may be difficult. Youth may not practice abstinence perfectly, just as they might not use condoms consistently and correctly. Some may consider themselves to be practicing abstinence if they abstain from vaginal intercourse, even if they engage in other kinds of sexual intimacy. A young person may have sexual intercourse in a "weak" moment, which emphasizes the need to help youth develop abstinence skills. Other youth may be coerced into sexual intercourse. In a study conducted in KwaZulu Natal, South Africa, a province greatly affected by the HIV/AIDS epidemic, 24 percent of some 800 girls ages 15 to 24 years reported having been "persuaded" or "tricked" into their first sexual experience.[5]

However, delaying sexual debut or abstaining from sexual intercourse after having been sexually active can be empowering. "Youth may lack power in many aspects of their lives," said Dr. Nancy Williamson, director of YouthNet and an FHI vice president. "But most youth *do* have the ability to abstain from or delay sex, once they understand the benefits of doing so."

Claudia Daileader Ruland,
YouthNet Information Dissemination

References

1 Bessinger R, Akwara P, Halperin D. *Sexual Behavior, HIV, and Fertility Trends. A Comparative Analysis of Six Countries. Phase I of the ABC Study*. Washington, DC: U.S. Agency for International Development, Measure Evaluation, 2003.

2 United Nations Children's Fund (UNICEF). *Young People and HIV/AIDS: Opportunity in Crisis*. New York, NY: UNICEF, 2002.

3 World Health Organization. The context of young people's sexual relations. *Progr Reprod Health Res* 2000;53:2-3.

4 World Health Organization. *Broadening the Horizon: Balancing Protection and Risk for Adolescents*. Geneva, Switzerland: World Health Organization, 2002. Available: *http://www.who.int/child-adolescent-health/New_Publications/ADH/WHO_FCH_CAH_01_20.pdf*.

5 Manzini N. Sexual initiation and childbearing among adolescent girls in KwaZulu Natal, South Africa. *Reprod Health Matters* 2001; 9(17):44-52.