Commentary

HIV Prevention: The Need for Methods Women Can Use

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Abstract: Efforts to prevent heterosexual transmission of HIV (human immunodeficiency virus) infection have thus far focused on modifying sexual behaviors and the use of condoms. While the experience of family planners, particularly in those countries most threatened by heterosexual HIV transmission, has shown that the most effective measures of pregnancy prevention have relied on women, little attention has been given to barriers to HIV transmission that depend on the woman and are under her control. Tactics which interrupt transmission of the virus should be considered in their own right and separated from those that interrupt pregnancy, for insurance, the diaphragm. Greater emphasis is urged for research on preventive methods women could use, including the possibility of a topical virucide that might block transmission through the vaginal route. (*Am J Public Health* 1990; 80:460–462.)

Introduction

At present, the sole physical barrier promoted for the prevention of sexual transmission of human immunodeficiency virus (HIV) infection from men to women is the condom. With condoms, active male cooperation is crucial. The proposition of this paper is that the empowerment *of* women is crucial for the prevention of HIV transmission *to* women. It follows that prophylaxis must include procedures that rely on the woman and are under her control. A wider range of chemical and physical barriers that block transmission through the vaginal route must be developed and tested. A few potential candidates for topical use are available, for example, nonoxynol 9,[1] sodium oxychlorosene,[2] and benzalkonium chloride;[3] these have been used as gels, suppositories, ovules, or sponges. These might be used immediately before or after intercourse. Alternatively, a virucide might be incorporated into a vaginal ring or an intra-cervical device. A female condom has also been described.[4] This, as well as the traditional diaphragm, need evaluation.

Prevention of Sexual Transmission

Worldwide, the main route for the transmission of HIV infection is sexual. Current public health strategies for the prevention of sexual transmission focus on four issues, namely, partner selection,[5–7] partner number,[8–10] mode of sexual expression,[11–14] and the use of condoms.[15,16] Advocacy bearing on each of these has proved effective in some circumstances and to some degree.[17–21] Thus there is excellent reason to persist with efforts to disseminate persuasive health education messages about these issues. Nonetheless, one must accept that in the world perspective these strategies are woefully inadequate.

Condom Use

The *efficacy* of condom use can be defined as the reduction in HIV transmission risk achieved on each occasion a condom is used in the prescribed manner. Efficacy is not easy to establish.[15] One working estimate suggests that condoms reduce risk by a factor of 10.[7] Combined with spermicidal lubricants, they may be considered more efficacious.[16]

The *effectiveness* of a program based on condom use must be measured against the public health objective, which is to prevent the spread of the AIDS (acquired immunodeficiency syndrome) epidemic in the population by blocking transmission of virus in individual sexual encounters. Effectiveness requires acceptability and compliance as well as efficacy. Hence condoms may be highly efficacious—transmission might be interrupted in as many as 99 percent of encounters—and yet be ineffective if used in few encounters. The equation between public health objective and the effect of intervention is well illustrated by a report from Africa on seropositivity and condom use among women whose livelihood depends on earnings from sex (prostitutes or, as some prefer to be called, sex workers). Condom use appeared to be efficacious; all 22 women who used condoms for every episode of vaginal intercourse were sero-negative. At the same time, as a method, condom use was not effective. The 22 regular condom users comprised under 4 percent of the 568 women interviewed, and the overall rate of seropositivity in the group was 11 percent.[22]

Programs promoting condoms have achieved substantial success in establishing their efficacy and acceptability, hence effectiveness, among men who have sex with men.[10,17] Among hetersexual couples, effectiveness is likely to depend far less on efficacy (in barring transmission per coital act) and much more on acceptance by the male partner. Apart from the report mentioned above, there are other reports of varying degrees of effectiveness of the condoms among women sex workers.[19,23] In these sexual encounters, as more generally, men must comply with the woman's suggestion that they use the condom. For the sex worker, the woman's leverage depends on the market for her services. For other women, leverage depends on more subtle power relations between the sexes. In general the mixed results obtained in several programs urging the use of condom emphasize their limited acceptability.[15,17,22] The ultimate effects of condom use on HIV transmission, in heterosexual populations at large with either high or low HIV prevalence, remain largely untested.

In the more developed world and the less developed world, a key problem with the condom from the point of view of the woman is that it calls upon the woman to assert dominance in the sexual act. Almost everywhere such dom-

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inance is not the traditional mode, and imposes unfamiliar behavior on both members of the couple. Logic dictates that the educational message about condoms, to be effective, must be targeted at the man or couple. If targeted at the woman, she in turn has to persuade her partner, and therein lies the difficulty.

The Role of Women in Prevention

Partner selection, partner reduction, mode of intercourse, and use of condoms, even taken together and on the most optimistic view, do not begin to approach a capability for the complete prevention of sexual transmission. Despite this gap in the defenses against AIDS, little effort has so far been made to expand the range of preventive tactics. Under the circumstances, one may ask why so little attention has been given to barriers to HIV transmission that depend for their use on the woman.

One reason may be that the initial attempts to interrupt sexual transmission of the HIV virus were faced with an epidemic in the United States and Europe that raged not among women but among men. In a crisis that seemed to be passing women by, the relevance of the experience garnered over the years from family planning programs mainly engaged with women would not have been immediately evident. Many social scientists, demographers, health professionals, and field workers stress methods that give women independent control over their fertility.* In those countries now most threatened by heterosexual HIV transmission, it has been learned and relearned that the most effective methods of pregnancy prevention have depended upon women. Among all couples using contraceptives in Africa and Latin America in 1983, fewer than 7 percent relied on the male methods of condoms or vasectomies.[24]

Discussions of the HIV epidemic and the prevention of transmission scarcely refer to this literature. We have been slow to respond to an observation of Ehrhardt: "The threat of HIV infection dramatically reduces women's control. Use of a condom reduces the risk of transmission of HIV infection through sexual behavior, but using condoms requires the cooperation of the male partner."[25] Even family planning professionals who have written on the HIV problem[15] have seemed insufficiently aware that the HIV epidemic restored to men the locus of control over the consequences of sexual behavior.

The lack of notice accorded to this new situation perhaps accounts for the analogous lack of attention to methods that might bar transmission at the woman's initiative. The literature on the sexual transmission of other diseases to women is relevant here.[26] Diaphrams protect women from gonorrhea as well as do condoms used by their partners. Spermicides, used alone or together with diaphrams, also confer protection. With or without spermicides, no evidence shows that condoms protect women better than diaphrams do. Epidemiologists today recognize cervical cancer as a sexually transmitted disease. In two quite different studies, risk of either dysplasia or neoplasia was reduced three-to four-fold. Men control the use of condoms. Women control diaphragms and can control topical virucides. To prevent AIDS, both men and women need to be empowered.

At the international meetings on AIDS in Stockholm in 1988 and again in Montreal in 1989, remarkably few of the thousands of presentations and abstracts considered the prevention of transmission by means that did not involve at least the active participation of the man. One important and influential study, presented at both meetings,[27,28] compared the effectiveness, among sex workers in Nairobi, of a contraceptive sponge and a placebo suppository. In that study, acceptability, hence compliance, was gratifying for both treatments (86 percent for the sponge, 95 percent for the placebo suppository).[27] Unfortunately, the seroconversion rate remained high in both groups, suggesting that neither treatment was efficacious. The later report in Montreal[28] confirmed the poor results and evoked the possibility of especially adverse effects in women using the spermicidal sponge. This study urgently needs full evaluation, if it is not to have untoward effects on any further work in this field. One obvious interpretation is that it was the sponge (as compared to the suppository) and not the spermicide used with the sponge, that caused the adverse effects in this particular field situation.

Two other reports, one from Rwanda[29] and the other from Zaire,[20] bear closely on the issue of acceptability in the use of barriers by women. In Rwanda, among 221 women advised about the routes and risks of HIV transmission, 112 agreed to try a preventive method. Three-fourths of those women who cooperated opted for a method that they could use themselves without calling upon the man: one-fourth opted for a foam and one-half for a cream; only one-fourth opted for condom use. In Zaire, this time again among sex workers, spermicidal ovules were well accepted by the women, and were used in 92 percent of client encounters. Up to half the women reported regular condom use; the main non-use of these was attributed to client refusal.

Properties Required of Topical Barriers

To the extent that family planning experience and the Rwanda and Zaire observations hold true over much of the world, the role and preferences of women in controlling the manner of the sex act raise serious questions about the effectiveness of condoms. Barriers that depend on the woman alone may be less efficacious than condoms and at the same time, more effective in the long run, if consistently and widely used.

Desirable properties of a vaginally inserted barrier or virucide therefore concern acceptability (they must be convenient to use, non-irritant, non-toxic, and low-priced) and efficacy (they must be governed by knowledge about the nature of sexual transmission of the virus). Transmission to a woman from an infected man involves the deposition of HIV-infected seminal fluid into the mucous membranes lining the vaginal or anal passages. The virus is transported, arguably not usually by sperm, but certainly by the lymphocytes or macrophages in the seminal fluid. Spermatozoa making their way through the vaginal mucus to the cervical os are unencumbered by these cells, and therefore may not typically be involved in transmission.

Tactics which interrupt transmission of the virus should be considered in their own right and separated from those that interrupt pregnancy. Recent documentation of the high prevalence of pro-natalist sentiment in Zaire points to the potentially important role of making this separation.[30] Steps taken to prevent reproduction (vasectomy, or intra-uterine devices and oral contraceptives) may do nothing to interrupt HIV transmission. Spermicides and other barriers to reproduction need be effective only during the short period of ovulation; virucides and other barriers to HIV transmission must be in place during every intercourse and always effective.[15]

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A virucide might be toxic to the sperm (and perhaps, for safety or at the woman's individual choice, it should be). Nevertheless, by distinguishing the purposes of a virucide from those of a spermicide, we open up possibilities for development and varied use. With regard to the efficacious timing of the action of the barrier agent, spermatozoa are mobile and must be trapped in their course. By contrast, lymphocytes and macrophages are relatively immobile and are vulnerable to attack over a longer time. Thus a virucide could be packaged so that it is released at a rate optimal for scavenging the virus-containing cells likely to be present in the female urogenital passages after intercourse. With regard to topical application, a spermicide must be used before the seminal fluid reaches the vaginal cavity. Insertion of a virucide shortly after ejaculation might be as effective as insertion beforehand, which could add considerably to a woman's leverage and control in protecting herself.

The chance that a vaginal virucide would offer complete protection against transmission may or may not be high, and it would certainly be irresponsible for development of this new tactic to supersede or diminish any of the existing approaches. Even if women prefer a topical virucide, one would certainly not advocate that condom use be superseded. As illustrated above, however, a less efficacious barrier (one that fails more often than another on each sexual encounter), if frequently used, might serve the public health as well or better than a more efficacious but less frequently used barrier, and could in the end play an important role in preventing transmission at the population level. For these reasons, we should urge development of vaginal barriers including virucides as an addition to the preventive means currently available. Only in those circumstances that the condom is not available or acceptable should it be the sole barrier used; but in that case it would be far superior to using no barrier at all. The technical means for soon effecting this addition to our preventive armamentarium seem well within our grasp.[31]

In conclusion, methods that women could use to prevent HIV transmission seem so far to claim very little of national or international research budgets whether at the level of biological or clinical or social sciences. Fuller recognition of some of the issues raised above, at the science and public policy levels, seem to be badly needed.

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