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Use of Withdrawal (Coitus Interruptus) for Both Pregnancy and HIV Prevention among Young Adults in Rakai, Uganda

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Abstract

Introduction—Though understudied in the context of AIDS, use of withdrawal (coitus interruptus) with or in place of other prevention methods affects exposure to both pregnancy and HIV.

Aim—We used mixed methods to assess use of withdrawal among 15–24 year-olds in a rural Ugandan setting with considerable HIV prevalence.

Methods—We measured withdrawal reporting among 1) sexually active 15–24 year-olds enrolled in a quantitative community survey (n=6722) and 2) in-depth qualitative interview participants systematically selected from the latest round of the community survey (N=60). Respondents were asked about family planning and HIV prevention practices, including a direct question about withdrawal in the in-depth interviews.

Main Outcome Measures—Reports of current use of withdrawal on the quantitative survey (general question about family planning methods) and reports of current or recent use withdrawal in qualitative interviews (specific question about withdrawal). Qualitative interviews also probed for factors associated with withdrawal use.

Results—Although less than 1% of quantitative survey participants spontaneously named withdrawal as their current family planning method, 48% of qualitative interview respondents reported current or lifetime use of withdrawal. Withdrawal was often used as a pleasurable alternative to condoms, when condoms were not available, and/or as a “placeholder” method before obtaining injectable contraception. A few respondents described using withdrawal to reduce HIV risk.

Conclusion—Qualitative findings revealed widespread withdrawal use among young adults in Rakai, mainly as a condom alternative. Thus, withdrawal may shape exposure to both pregnancy and HIV. Future behavioral surveys should assess withdrawal practices directly—and separately

Conflict of Interest:

No conflicts of interest need to be noted.

from other contraceptives and HIV prevention methods. Further clinical research should further document withdrawal's association with HIV risk.

Introduction

Withdrawal, or coitus interruptus, is conventionally regarded as a less effective method of pregnancy prevention. With typical use, approximately 18% of heterosexual couples practicing withdrawal and no other contraceptive method will become pregnant over one year (although *perfect* use of this method is associated with a 4% failure rate) (1). Withdrawal is thus slightly less effective than male condoms, which have typical use and perfect use failure rates of 17% and 2%, respectively (1, 2). Moreover, although withdrawal users in many studies employ it as a secondary method of protection, withdrawal remains unexplored as part of a larger sexual risk reduction strategy, particularly among heterosexual couples (3)—despite reports of withdrawal use as an occasional strategy for reducing odds of HIV transmission among men who have sex with men (4). Despite two recent calls for more research on this prevention method (3, 5), the literature remains notably sparse both domestically and globally. More accurate assessments of withdrawal are needed to understand and address how people attempt to prevent both pregnancy *and* HIV.

The dearth of research on withdrawal in sub-Saharan Africa is particularly striking. The overwhelming majority of family planning research in the area has focused on modern methods of contraception (5). Moreover, the devastating HIV epidemic in the region has led to an understandable focus on HIV prevention technologies such as condoms, microbicides and male circumcision. Yet the higher prevalence of HIV in this region provides even further justification for a study of withdrawal, particularly since use of withdrawal instead of condoms may affect HIV exposure. Studies from Western countries indicate that withdrawal users are likely to practice the method in conjunction with other coital-dependent methods such as condoms, but this “method sequencing” phenomenon remains unexplored in sub-Saharan Africa (6). The ways in which people use withdrawal versus other prevention methods will affect their risk of both pregnancy *and* HIV (7).

Withdrawal and Sexual Risk Reduction

Though withdrawal's efficacy as a pregnancy prevention mechanism is well established, its effect as an HIV prevention mechanism is unknown. Previous studies measuring semen and pre-ejaculate have observed macrophages and CD4 lymphocytes in most samples, indicating the potential exposure to intracellular HIV (8), and cell-free virus is present in semen. Genital viral load is predictive of HIV transmission risk (9). However, given that withdrawal reduces semen exposure and possibly viral exposure in the receptive partner, researchers have suggested withdrawal may provide some protection against male-to-female transmission of HIV (7, 10, 11). One prospective, longitudinal study of 256 sero-discordant heterosexual couples found that male-to-female transmission of HIV decreased by more than one half when withdrawal was practiced compared to intercourse with ejaculation inside the vagina (12). Moreover, at least some men who have sex with men have used withdrawal prior to ejaculation during anal intercourse in order to reduce risk to the receptive partner (4).

Regardless of withdrawal's potential role in HIV risk reduction, the ways in which withdrawal is practiced in place of condoms will affect STI exposure, justifying better assessments of how and when withdrawal is used. For example, a study of withdrawal use among African American adolescents found that those participants who reported withdrawal use *and* inconsistent condom use were significantly more likely to have contracted Chlamydia, gonorrhea, or Trichomoniasis in the past three months compared to those reporting consistent condom use and no withdrawal (13). Evidence from the US suggests that use of withdrawal influences condom use (i.e., withdrawal is used in addition to condoms or as an alternative to condoms), and most people who use withdrawal consider it a *secondary* versus a *primary* method of preventing pregnancy (14–16). Withdrawal is also regularly used as a back-up method or as an occasional method when no others are available (15), in cases of condom breakage (13), and in cases of unprotected vaginal intercourse prior to condom application (17). However, withdrawal's role in potential sexual risk-reduction strategies has been almost entirely unexplored among heterosexual couples, particularly in higher prevalence settings.

This study attempts to fill these gaps analyzing community cohort data and qualitative sexual history data from young adults (15–24 year-olds) in Rakai, Uganda.

Methods

Rakai Youth Project Study Overview and Design

Data derive from the Rakai Youth Project (RYP), which uses mixed methods to explore changing patterns of HIV incidence and family planning practices among 15 to 24 year-olds in a southwest district of Uganda—Rakai. In a quantitative arm of the study, RYP investigators analyzed Rakai community cohort data from approximately 7000 young adults over nine years to explore changing behavioral, biological, and demographic risk factors (18). We also conducted qualitative life history interviews to assess young people's "risk" or "protective" factors within the context of their lives, relationships, and sexual histories. Sexual history participants were recruited using an innovative "qualitative case-control" design: Thirty incident HIV-positive participants were systematically selected from the cohort study and then matched to 30 HIV-negative "controls" by gender, marital status, age group, and place of residence (19). The goal was to pair HIV+ with HIV- respondents while controlling for variables most strongly associated with HIV exposure. All respondents were sexually experienced, though some more so than others based on age, marital status, and number of prior partners. More information on the qualitative case control design and participants can be found elsewhere (19). The final sample consisted of 60 young adults, half HIV+ and half HIV-, half women and half men, a mix of marital status (married, previously married and never married), and a mix of villages (rural and peri-urban).

Community Cohort Survey Procedures and Measures

The Rakai Community Cohort Study (RCCS) is an ongoing longitudinal epidemiological surveillance study of 15–49 year-old residents in 50 communities in Rakai District, southwestern Uganda (described previously (20, 21)). RCCS participants are surveyed approximately annually, at which time they also receive HIV prevention education and

provide biological specimens for HIV and STI testing. HIV detection uses two separate ELISA tests, and discordant results or new seroconversions are confirmed by HIV-1 western blot (22). Voluntary HIV counseling and testing (VCT) is offered to all study participants. As of 2004–5, when antiretroviral therapy became available, all HIV+ study participants have access to this service, provided free of charge by the Rakai Health Sciences Program with PEPFAR support.

The community survey subpopulation included in this analysis involved sexually experienced youth participating in the RCCS between 2002 and 2011. For minors, assent and parental/guardian consent for research participation was obtained. Adults aged 18+ years provided individual informed consent. RCCS questionnaires are administered via face-to-face interviews, which are conducted in private locations by same-sex interviewers. The RCCS achieves over 85% coverage among all eligible residents present in the community at each survey round. Among consenting participants, 99% respond to the full questionnaire and over 90% agree to specimen collection.

Withdrawal estimates were derived from the RCCS question on current family planning method. Participants were asked, “Are you or your partners currently using any of the following family planning methods?” Response prompts included pills, condoms, spermicide, injection, abstinence, calendar/rhythm, IUD, breastfeeding, herbs/traditional medicine, and “other method (specify: _____). If a respondent indicated “other,” the interviewer would write down the method reported (e.g., withdrawal, tubal ligation, hysterectomy, etc.).

Qualitative Interview Procedures and Measures

Between June 2010 and June 2011, using rounds 13 and 14 of the RCCS data, investigators located a total of 30 young adults between the ages of 15–24 who had acquired HIV in the last twelve months. These 30 incident cases were then matched with HIV negative controls given the criteria outlined above.

Sexual history participants were interviewed in Luganda (the local language) in private settings in or near participants’ homes. Interviews explored a range of factors pertinent to withdrawal use, including relationship history, pregnancy history and desires, past and current sexual practices, and the importance of pregnancy prevention versus HIV prevention in respondents’ lives. Participants were asked about contraceptive methods they had used and/or were using currently. To address the anti-reporting bias sometimes observed with withdrawal (i.e., since many people fail to think of withdrawal as a “method”(3)), participants were also asked the following questions (here in their English versions):

1. Many people use condoms some of the times they have sex, but not every time. Have you had situations in which it is hard to use a condom every time you have sex? If so, please tell me about that.
2. How about withdrawal, or “pulling out”? Do you ever use it currently or have you used it in the past? What might explain those times in which you use withdrawal or do not use withdrawal?

Respondents' answers to these questions have the potential to illuminate withdrawal practices in this higher HIV setting, particularly when considered in light of relationship issues, HIV versus pregnancy prevention priorities, etc.

Data Analysis

For the quantitative analysis, we used data from sexually experienced youth aged 15–24 years from five rounds of the community survey (rounds 9–14, or 2002–2011). Since respondents were not specifically asked about withdrawal as contraceptive method, we used the responses provided for the “other family planning” category to generate a binary withdrawal variable.

The recorded qualitative interviews were translated and transcribed, and the resulting data were cleaned and entered into Atlas.ti, a qualitative software package. Four masters- and doctoral-level team members led by the first author coded the data and identified 30 conceptual codes relevant to our research interests—most immediately the larger question of why some young people acquire HIV and some do not in a relatively socio-demographically homogenous area of Uganda (19). Examples of codes include death of a parent, school and work experiences and aspirations, HIV testing history, and transactional sexual experiences. These codes were defined, operationalized, then applied to blocks of interview text that contained those particular codes. For the current paper, the codes of “withdrawal” and “condoms” were especially pertinent. Though withdrawal use did not emerge as a primary explanatory factor in why some young people had recently contracted HIV while their HIV-matches remained seronegative, the widespread reporting of withdrawal seemed notable and deserving of further analysis. We read every occurrence of withdrawal in the interview transcripts, including the larger interview context, and noted the co-occurrence of other codes such as condom use or family planning. A data display matrix organized by both gender and HIV status helped track the main themes that emerged throughout the analysis (described below).

Ethics

Institutional review board (IRB) approvals for the current analysis and RCCS were obtained from Uganda Virus Research Institute's Science and Ethics Committee, Uganda National Council for Science and Technology, and from IRBs at Columbia University, Johns Hopkins University, and University of Wisconsin-Madison in the U.S.

Results

Overview

Reported use of withdrawal in the community survey was low. Among sexually active 15–24 year-olds, only 0.41% reported withdrawal as their current contraceptive method.

Although withdrawal was rare in the quantitative community survey, the attendant interview data revealed more widespread occasional withdrawal use among study participants, particularly in conjunction with condoms and/or as a precursor to more effective contraceptive methods. Twenty nine out of 60 respondents (48%) described ever using

withdrawal at least occasionally when asked directly about the practice during in-person interviews.

Qualitative data analysis revealed three primary themes relating to withdrawal practices, presented here in order of occurrence and magnitude: 1) withdrawal as a back-up method of pregnancy prevention, 2) withdrawal use alternated with condom use, and 3) withdrawal as an HIV risk reduction strategy. Few differences emerged by either gender or HIV status; however, only women discussed withdrawal as a precursor to a different family planning method as well as their partner's willingness to try a different method.

Withdrawal as a Back-Up Method of Pregnancy Prevention

The overwhelming majority of withdrawal users reported using the method for pregnancy prevention purposes—but usually *used alternatively with or as a contraceptive placeholder for* more effective methods of family planning, and often with a realistic sense of withdrawal's limitations. For example, one married, HIV-positive woman reported that withdrawal was an important precursor to a contraceptive method that demanded interaction with the health care system. She said, "I use withdrawal because I have not yet gone for family planning [hormonal contraception]. I was told you first have to go for a blood check-up because Depo Provera affects women. You have to ask a health worker about contraceptives. So we decided to use withdrawal." She was one of several respondents who indicated that, ideally, they would use a more effective method of contraception, and may even have plans to do so, but withdrawal was more readily available in the meantime.

On a related note, participants not only expressed a realistic sense of withdrawal's limitations, but they also described outright failure to use the method effectively—though they did not necessarily stop using withdrawal as a result. For example, one previously married, HIV negative woman reported that her partner consistently used withdrawal. When asked if there were times when her partner would fail to use withdrawal, she responded, "When he failed that is when I conceived." When similarly prompted with the question, "What might explain those times in which you use withdrawal or do not use withdrawal?" a married, HIV positive man responded:

I have a lot of sexual desire...at times I develop a lot of sexual desire and it gets to a time of ejaculation and decide not to withdraw. I felt so bad and got to a point of regretting why I failed to withdraw, you know there are some women whom we find on the way and have one time sex with them. Such women one would not want to fail to withdraw as you have sex. Such women are very fast at becoming pregnant.

Though this respondent described the difficulty of using withdrawal, as well as the unintended pregnancies that can result from its use, he nonetheless described using withdrawal at least occasionally—in keeping with other respondents who used it as a back-up method from time to time when other methods were not available or palatable. Even though study participants reported withdrawal's inefficacy and the difficulty of its appropriate use every time, many of them were still using coitus interruptus to reduce overall pregnancy risk.

Withdrawal Alternated with Condoms

A number of withdrawal users reported practicing withdrawal as an occasional or regular alternative to condoms. For example, when asked if he and his partner had taken any steps to prevent pregnancy, a married, HIV-negative man responded, “At times, I use a condom. At times, I use withdrawal.” A never-married, HIV-negative woman said, “We use withdrawal when we don’t use condoms.”

Several reasons helped explain such method sequencing, including unavailability of condoms in the heat of the sexual moment, partner refusal of condoms, and/or when pleasure and desire undermined condom use. Many participants described how condoms could reduce sexual pleasure and satisfaction—a criticism never described in relationship to withdrawal. One married, HIV-negative man reported, “Sometimes it is difficult to use a condom if I really want to feel pleasure. Sometimes I will withdraw before I ejaculate instead.” Women also reported difficulty in negotiating condom use with their male partners, and these gendered power dynamics could sometimes help explain withdrawal use. One never-married, HIV positive woman said, “Yes, I have used withdrawal. [...] Sometimes he refuses to wear condoms, so we use withdrawal instead.”

Withdrawal as an HIV Risk Reduction Strategy

A small but notable minority of respondents discussed withdrawal as a way for reducing HIV risk. Though this theme did not occur as commonly as the ones above, its salience to our larger research question justifies a closer analysis. The most salient example comes from a never-married, HIV-positive man, who said the following when asked if and when he uses withdrawal:

Respondent: I have HIV and I would not like to spread it to other people. Second, I do not want to produce a baby when I have HIV. It is something difficult to me and I do not want it.

Interviewer: Do you mean to say that the withdrawal method helps you prevent both HIV and pregnancy?

Respondent: Yes. Though it is not 100% effective.

This respondent and two others (one an HIV-positive married woman, one an HIV-negative previously-married woman) reported using withdrawal as a way to reduce either one’s person risk or one’s partner’s (and potential offspring’s) risk of acquiring HIV. Outside from associating withdrawal with HIV risk reduction, these three respondents did not differ in meaningful ways from other interviewees. In keeping with a pervasive pattern, all three reported condom use at the beginning of their relationships with their respective partners then cessation of condoms later in the relationship as intimacy developed.

Discussion & Implications

This study of young adults in Rakai, Uganda was among the first to examine withdrawal practices in a high HIV-prevalence setting and to consider how, through alternation with condom use, withdrawal use may affect exposure to both pregnancy and STIs/HIV.

Consistent with other quantitative surveys, including the 0.08% of Ugandans reporting withdrawal as their current contraceptive on the 2010 Ugandan Demographic and Health Survey, our findings revealed that less than 1% of community cohort survey participants reported withdrawal as a current family planning method. This low rate presumably reflected, at least in part, the way the question was asked. However, reporting of occasional withdrawal use was more widespread in the qualitative in-depth sexual history interviews, in which participants were asked directly about withdrawal. Findings are consistent with studies of withdrawal use in the United States, in which fewer research participants select withdrawal from a longer list of family planning methods compared to those who respond positively to direct questions about pulling out and/or single items regarding withdrawal use (3).

In keeping with research from the US on withdrawal, respondents frequently used withdrawal alternatively with condoms (and/or other contraceptive methods). Also in keeping with literature in the US, most described withdrawal as a secondary versus a primary method of reducing pregnancy and/or HIV risk—which helps explain why reporting of withdrawal use may be low when prompted with a question about current family planning methods. Finally, a minority of respondents described using withdrawal as a way of reducing HIV transmission. Regardless of withdrawal's association with HIV risk, participants' use of this method (versus condoms) influenced their exposure to HIV as well as pregnancy (particularly when they failed to use it effectively); withdrawal practices also shaped their *partners'* exposure to HIV in the case of the HIV positive respondents.

Findings should be considered in light of study limitations. For example, we were unable to compare identical questions about withdrawal across both data sources. The community survey assessed withdrawal use from a question about *current* contraceptive method with multiple response options, while the sexual history interview asked directly about withdrawal in a separate question, but responses pertained to both *current* and *recent* or *ever* use of withdrawal. In keeping with other contraceptive surveys, the community survey did not actually include withdrawal on its list of family planning response prompts, meaning people had to offer it spontaneously and independently. Thus, estimates from the community survey are likely to be underestimates.

Despite these limitations, findings have implications for both behavioral and clinical studies. At the measurement level, people who consider withdrawal a secondary (or tertiary) pregnancy prevention method versus a primary one will be unlikely to select withdrawal from contraceptive method lists on Demographic Health Surveys and/or other questionnaires (3). Researchers and practitioners will remain un-informed about whether and how people use withdrawal in conjunction with condoms and other contraceptive methods unless we ask directly about “pulling out.” Furthermore, men must be included in such measurement efforts. Many withdrawal prevalence estimates worldwide are based on *women's* reports. Moreover, despite interest in increasing men's participation in family planning practices (23), researchers have conducted few studies on the methods available to men, particularly withdrawal (24). Heterosexual men are often left out of HIV prevention efforts, too (25). Of course, like condoms, coitus interruptus is a method that must be negotiated between two members of couple within the context of the sexual experience. Gendered power dynamics

are thus likely to play a role in withdrawal's use, and should therefore be attended to in any future studies.

With better prevalence estimates of withdrawal practices, we could conduct larger scale studies of risk-reduction practices, including how withdrawal is used in conjunction with condoms and as an alternative to condoms. Such studies which would not only provide a more accurate picture of sexual practices relating to both family planning and STIs/HIV, but would also provide important fuel for educational and clinical programs.

Finally, given that men and women in the US, Uganda, and elsewhere are already using withdrawal as part of an HIV risk reduction strategy, we encourage more clinical studies of potential HIV risk reduction through withdrawal use. Withdrawal is free and widely practiced—at least occasionally—by millions worldwide. Though such studies would need to be approached with great care given the potential exposure to HIV in pre-ejaculate fluid (8), at least preliminary exploration could potentially expand our public health toolkit of risk reduction strategies (and/or information on what *increases* risk). Following the example of male circumcision, one might analyze observational data before conducting a randomized controlled trial. Many Demographic Health Surveys and other behavioral studies collect systematic data on withdrawal; even though such reports are likely to be underestimates, these data could potentially be used to explore associations between withdrawal rates and HIV rates across regions and/or countries. Clinical studies of condom-and-withdrawal combinations versus condoms alone may also be justified given the pervasiveness of these combined practices. Further exploring the potential utility or danger of withdrawal as an HIV risk reduction method seems pragmatic.

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