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ORIGINAL PAPER

Comparing Couples' and Individual Voluntary Counseling and Testing for HIV at Antenatal Clinics in Tanzania: A Randomized Trial

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Abstract Voluntary counseling and testing (VCT) for couples (CVCT) is an important HIV-prevention effort in sub-Saharan Africa where a substantial proportion of HIV transmission occurs within stable partnerships. This study aimed to determine the acceptance and effectiveness of CVCT as compared to individual VCT (IVCT). 1,521 women attending three antenatal clinics in Dar es Salaam were randomized to receive IVCT during that visit or CVCT with their husbands at a subsequent visit. The proportion of women receiving test results in the CVCT arm was significantly lower than in the IVCT arm (39 vs. 71%). HIV prevalence overall was 10%. In a subgroup analysis of HIV-positive women, those who received CVCT were more likely to use preventive measures against transmission (90 vs. 60%) and to receive nevirapine for themselves (55 vs. 24%) and their infants (55 vs. 22%) as compared to women randomized to IVCT. Uptake of CVCT is low in the antenatal clinic setting. Community mobilization and couple-friendly clinics are needed to promote CVCT.

Keywords Couples · Voluntary counseling and testing · HIV · Antenatal care · Tanzania

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Introduction

A substantial proportion of HIV transmission in sub-Saharan Africa occurs within married or in union couples [1, 2]. Individual HIV voluntary counseling and testing (IVCT) addresses only half of the sexual partnership. Thus, IVCT cannot address the behavioral dynamics within the couple that could present barriers to behavior change. A recent study of home-based VCT among household members of HIV-infected individuals on antiretroviral therapy found that 43% of spouses were HIV negative [3]. In light of the substantial serodiscordance among couples, it is vital that couples be encouraged to counsel and test for HIV together. Couples voluntary counseling and testing (CVCT) is an opportunity for couples to learn about HIV transmission, discuss personal and combined risks, find out their and their partner's HIV status, and develop a collaborative plan with assistance from a professional for future protection from transmission [4–6]. Studies have shown that CVCT leads to greater protected sexual intercourse either compared to before the counseling [7–11] or to individuals receiving IVCT [12]. Furthermore, CVCT has been shown to be more cost-effective than IVCT [13].

CVCT is particularly relevant for pregnant couples. It can provide information on preventing transmission to HIV-negative women during pregnancy or while breast feeding, and, for HIV-positive women, preventing both mother-to-child transmission (MTCT) and transmission to her partner. Results on nevirapine use and formula feeding after CVCT vs. IVCT have been mixed [8, 14–16]. Documented uptake of CVCT in antenatal clinics in sub-Saharan Africa is below 20% [14, 16], presumably because most are not couple-friendly. Comparing CVCT with IVCT outcomes until now has been limited as studies have not utilized a randomized design. Here we report on a

randomized study comparing CVCT and IVCT at three antenatal clinics in Tanzania.

Methods

The objective of this research was to evaluate the acceptance and effectiveness of CVCT relative to IVCT in the context of antenatal care clinics in Dar es Salaam. We hypothesized that: (1) Offering women CVCT will not decrease their individual acceptance of VCT; (2) Among those offered CVCT, those who accept are younger and of higher socio-economic status than those who do not; (3) For HIV-positive women, compared to those having IVCT, those completing CVCT will have: (a) greater use of nevirapine for prevention of MTCT; (b) reduced sexual risk behaviors; (c) less domestic violence and marital disruption.

Population

The target population was pregnant women up to the sixth month of pregnancy, presenting for their first antenatal care visit at three antenatal clinics in the Temeke district of Dar es Salaam: Tayma, Seventh Day Adventist, and Khoja Isthner Asher. These clinics had not previously provided VCT. Pregnant women beyond the sixth month of pregnancy were ineligible because they might not return to the clinic before delivery. These women were not enrolled in the study, but rather offered IVCT at that visit. Those eligible for the study were pregnant married women currently residing with their spouse. For our purposes 'married' women were defined as those with a legal marriage, traditional marriage, or those living with the same partner for at least 2 years.

The requisite sample size was determined given the following parameters: the ability to detect a difference of 0.20 between the proportion of women testing in the two study arms and, among HIV-positive women, the proportion accessing nevirapine at the time of delivery, and the proportion reporting protective sexual behaviors at the time of the follow-up interview. Type I and Type II errors were fixed at 0.05 and 0.20, respectively, and HIV-prevalence was estimated at 14% [17]. Based on the aforementioned parameters, the largest sample size required was 720 per arm, which was rounded to 750.

In addition, two other outcomes for seropositive women were of interest: marriage dissolution and domestic violence. Grinstead [18] estimated marriage dissolution (approximately 7 months post-test) to be 1 and 19% and physical abuse from husbands to be 6 and 21% among HIV-negative and HIV-positive women, respectively. A sample of 750 women per study arm would yield approximately 100 HIV-positive women per study arm. With this sample size of HIV-positive study participants it would be possible to detect (assuming the same Type I and Type II errors) differences in the marital dissolution and domestic violence outcomes between the two study arms at the levels reported by Grinstead between HIV-negative and HIV-positive women.

Procedures

Before study recruitment began, formative research was conducted to determine the best modalities for the study. In-depth interviews and focus group discussions with women, men, and counselors in a nearby, similar antenatal clinic were carried out to determine the acceptability of CVCT, how to make the clinics couple-friendly, provide test results and counseling for serodiscordant couples, and resolve conflict within couples. Details of this research are reported elsewhere [19].

Counselors at each antenatal clinic were trained in couple counseling techniques. UNAIDS [20] and the U.S. Centers for Disease Control [21] both had detailed training guidelines for HIV VCT counselors generally, and these were adapted to the Temeke antenatal setting. The training also drew on the formative research results.

During an eligible woman's first visit to the clinic between May 11th, 2003 and February 23rd, 2004, after biological tests were done for gonorrhea and syphilis per standard procedures, the study was explained to the woman and she was asked to consent to study participation. Women who did not consent were offered IVCT. Each consented woman then completed a baseline questionnaire administered by a trained interviewer. The questionnaire collected information on: demographic, social, and economic variables (age, parity, schooling, occupation, and household possessions); knowledge of HIV transmission and prevention; and, whether she had experienced physical violence from her husband in the past 12 months.

All consented women were randomized to either CVCT or IVCT (every other one, sequentially). Women randomized to the control arm were then consented to receive IVCT immediately. Women randomized to the CVCT arm were asked to bring their husbands with them for CVCT at the next antenatal clinic visit. These women were given a letter from the Medical Officer addressed to the husband inviting him to come to the clinic to "discuss your pregnant wife's health as well as that of your unborn child". The letter, a recommendation from the formative research, did not explicitly state that the husband would be asked to consent to CVCT. The woman was told to return to the clinic even if her husband refused, or was unable to come. If the husband did not come with the woman, she was offered IVCT.

If the couple came to the clinic together and consented, they received counseling together. If only one spouse consented to counseling, s/he continued with IVCT; however, s/he was given a future appointment to receive the HIV test results in order to maximize confidentiality. If both members of a couple consented to testing, rapid HIV tests were performed.

If both partners consented to test but not to receive results together, we continued with IVCT for each. If both consented to receive results together, they had post-test counseling together. If the tests were negative, the couple was counseled on safe sex practices. For serodiscordant couples, if the woman was HIV-positive, they were counseled on nevirapine therapy and the father's role in supporting formula feeding or exclusive breast feeding. These couples were counseled intensively. The use of abstinence or condoms for protection was emphasized. If the husband was HIV-positive, the importance of abstinence or safe sex was stressed to protect the woman and baby. If both were seropositive, the couple was counseled on antiretrovirals, preventing MTCT, safe sex practices, and self-care, e.g. eating well and promptly seeking medical care in the case of opportunistic infections.

HIV serostatus was determined using a rapid HIV test algorithm comprised of screening with Capillus HIV-1/HIV-2 (Galway, Ireland), followed by confirmation of reactive samples by Determine HIV-1/2 (Abbott Diagnostics). Samples that were non-reactive on screening were considered sero-negative. According to the algorithm used, the tie-breaker for discordant samples (reactive on screening and non-reactive on the second rapid test) was an ELISA-based confirmatory strategy. On a weekly basis a random sample of up to ten specimens was re-tested at the Reference Laboratory at Muhimbili University College of Health Sciences for quality assurance.

All HIV-positive study participants were given information on the availability of antiretroviral treatment. Nevirapine was provided to the Temeke Hospital delivery ward where most women from these clinics reportedly delivered—to ensure access for all HIV-positive study participants. A nevirapine prescription was given to the woman, and a copy of the prescription was left at the hospital.

Each HIV-positive woman was asked to return to the clinic three months after the expected delivery date. She was told of the compensation for her travel if she returned. At that visit between January 7th, 2004 and October 28th, 2004, after consent a follow-up questionnaire was administered by an interviewer blinded to the woman's study arm. In the interview we asked about: (1) nevirapine use; (2) marital disruption; (3) domestic violence; and (4) using protection from HIV transmission. Specifically, the questions regarding protection from HIV transmission since testing were: "Are you using some ways to protect yourself and your husband from HIV transmission?" IF YES, "Which ways are using to protect yourself and your husband from HIV transmission?" Attempts were made by an interviewer to visit women at their homes if they did not return to the clinic.

Consent was sought at three stages during VCT: at counseling, testing, and receiving results (including sharing results with the partner in the CVCT arm). Persons not consenting to continue with CVCT at any time were encouraged to continue with IVCT.

The request that women randomized to the CVCT arm bring their husbands to the antenatal clinic could dissuade them from returning to the clinic; however, we thought this unlikely for several reasons: the receptiveness to the study during the formative research; all consenting women were fully informed about the study procedures; women who did not consent were still offered IVCT; and the high rate of return for antenatal clinic visits (mean of 4.0 visits) in Tanzania [22].

Ethical approval for this study was received from the Institutional Review Boards (IRB) of Muhimbili University College of Health Sciences and the Johns Hopkins School of Public Health. Participants were informed of the study purpose, the procedures, risks and benefits, and gave full informed consent before participating. A Data Safety Monitoring Board was created to monitor the acceptance of VCT in the two study arms, since failure to accept VCT meant that pregnant women who were HIV-positive would not be given the opportunity to receive nevirapine, constituting an adverse event. Although the interim reports from hand tallies of study logs showed no significant differences between the two arms, when the computerized data were later tabulated, it was found that the hand tallies had been in error. As reported in this paper, the computerized data showed that the VCT acceptance rate in the couples arm was significantly below that in the individual arm. When this was discovered, randomization to CVCT was discontinued and all women were offered IVCT. Soon thereafter study enrollment stopped. Only data for women randomized are reported here; data for $n = 8$ women enrolled after randomization ended are not included in the analysis. The Johns Hopkins School of Public Health IRB investigated the discrepancies between the study log and computerized tabulations, and determined that these differences were due to methods of tracking individuals in the hand tallies. The IRB approved the cleaned data for further analyses. This trial was registered at ClinicalTrials.gov number NCTOU631384.

Statistical Methods

Utilizing the clinic record books, baseline questionnaires, VCT forms, and follow-up forms, we determined the

numbers and proportions of women and couples who participated in the sequential steps of VCT. For this study we define CVCT as a couple receiving counseling, testing, and test results together. To examine selection bias by subgroup within the CVCT arm, distributions and means of key socio-demographic, HIV, and domestic violence variables were calculated for the following CVCT subgroups: a. women who completed CVCT; b. women who completed IVCT; c. women who returned to the clinic but did not complete VCT; and, d. women who did not return to the clinic. ANOVA with *F*-tests and chi-squared statistics were utilized to assess differences between the four CVCT subgroups. To test hypothesis 2, *t*-tests and multiple logistic regression were utilized to compare those who completed CVCT with those who did not. For the subgroup analyses on the follow-up data for HIV-positive women, due to the small sample, Fisher's exact test was utilized.

An economic variable was created from questions about household ownership of six items: radio, television, refrigerator, bicycle, motorcycle, and car or truck. Since very few households owned items other than a radio, a binary variable was created by assigning 0 to women in households that owned none of the items or only a radio, and assigning 1 to all other women.

The HIV knowledge score was based upon correct answers to six HIV knowledge related questions—(1) Two questions related to HIV prevention: Can people protect themselves from getting the AIDS virus: by abstaining completely from sex?; by using a condom every time they have sex? (2) Two questions on general HIV knowledge: Can a person get the AIDS virus from mosquito bites?; and Is it possible for a healthy-looking person to have the AIDS virus?, and (3) Two questions related to mother to child transmission: Can HIV be transmitted during pregnancy?; and, Can HIV be transmitted during breast feeding? Each correct answer was given a score of 1; individual total scores ranged from 0 to 6.

The baseline questionnaire also included questions on physical violence. The study participants were asked if a husband is justified in beating his wife for six specific situations (burning the food, neglecting the children, answering him back, talking to other men, wasting his money, and refusing him sex). Each response was coded 0 if the respondent said beating was not justified and 1 otherwise; total scores ranged from 0 to 6. Age was imputed for seven women and similarly years of schooling for four women.

Results

Randomization was checked by examining the background characteristics by study arm (first 2 columns of Table 1). The two experimental groups are comparable on all background characteristics except for the percentage knowing someone living with HIV/AIDS or who had died from AIDS related causes. It is important to note that with tests for 12 variables, the probability by chance of one or more showing significant results at the 0.05 level is 0.46.

The study results are summarized in Fig. 1. Among the 761 women randomized to receive IVCT, 704 (93%) agreed to counseling, 595 (78%) to testing, and 538 (71%) to receive results. Among the 760 women randomized to CVCT, only 254 (33%) returned with their partners, 115 (15%) returned alone and 391 (51%) did not return at all. Of those who came as couples, 119 (47%) agreed to counsel, test, and receive results together. Only 16% of all women randomized to receive CVCT actually completed CVCT. Including those who opted for IVCT (cross-overs), overall in the CVCT arm 327 (43%) women tested and 294 (39%) received results ($z = 12.5$, $p < 0.001$ for the test of the hypothesis of equal proportions testing and receiving results in the two arms). Thus hypothesis 1 is not supported. To summarize, using intent-to-treat analyses, of those randomized to CVCT, 39% (294/760) completed VCT, while of those randomized to IVCT 71% (538/761) completed VCT. Among women in the CVCT arm who returned to the clinic (alone or with their husbands), 80% (294/369) completed VCT whereas of the women randomized to and offered IVCT, 75% (538/717) completed VCT.

Of the 922 women who tested in both arms combined, 93 (10%) were HIV-positive and 81 (87%) of the 93 completed the follow-up interview. Among those who tested, HIV prevalence was 10% in both the IVCT arm (59/595) and the CVCT arm (34/327).

The last 4 columns of Table 1 show the characteristics of women randomized to CVCT by their level of participation. ANOVA and chi square tests of the four groups demonstrate significant selection by age, parity, years of schooling, working status, and religion. In the bivariate comparison of women randomized to CVCT who did not receive it ($n = 641$)—to women who participated as part of a couple in CVCT ($n = 119$), those who completed CVCT were significantly younger, of lower parity, were less likely to be Muslim, and were less likely to have ever experienced domestic violence. In the multiple logistic regression only age and religion remained significant (not shown). The regression model did not include parity as it was collinear with age and only one domestic violence variable—ever beaten—was included. Thus, hypothesis 2 is partially supported (younger age). In a comparison of the women in the IVCT and CVCT study arms who tested and received results, without regard to type of VCT received (intent-to-treat analyses), those in the IVCT arm

Table 1 Characteristics of women randomized to individual or CVCT, and by their actual participation in CVCT in an experimental study in 3 antenatal clinics in Dar es Salaam, Tanzania

Characteristic	IVCT ($n = 761$)	CVCT ($n = 760$)	Participation of women randomized to CVCT			
			CVCT[b] ($n = 119$)	IVCT[c] ($n = 175$)	Incomplete VCT[d] ($n = 75$)	Lost to follow-up ($n = 391$)
Age (mean)	24.9	24.7	23.5†	24.7	24.0	25.2‡
Parity (mean)	1.2	1.1	0.8†	1.2	1.0	1.2‡
Education (mean)	7.0	7.0	7.1	6.6	6.4	7.2‡
No items or radio only[a] (%)	52	53	61	52	59	50
Working (%)	28	27	21	29	16	30‡
Religion: % Muslim	75	73	61†	73	77	75‡
HIV knowledge score (mean)	4.7	4.6	4.5	4.7	4.6	4.7
Know someone with HIV or who died of AIDS (%)	73*	68	64	65	63	71
Know where to buy condoms (%)	81	79	76	79	71	81
Ever beaten by husband (%)	19	16	10†	14	17	19
Beaten in last 6 months (%)	8	7	4	4	5	9
Beating scenarios justified (mean)	1.7	1.6	1.5	1.8	1.7	1.6

* $p < 0.05$ for test of hypothesis that women in the two randomized study arms are from the same population (*t*-tests)

† $p < 0.05$ for the test of hypothesis that the women receiving CVCT are the same as those randomized to CVCT who did not receive CVCT (*t*-tests)

‡ $p < 0.05$ for the test of hypothesis that four CVCT subgroups are from the same population (ANOVA/chi square tests)

[a] Out of a total of six items: radio, television, refrigerator, car, motorcycle, and bicycle

[b] Complete CVCT is interpreted here as receiving counseling, testing, and test results as a couple

[c] IVCT is interpreted here as receiving counseling, testing, and/or test results as an individual

[d] Incomplete VCT is refusing either counseling, testing, or receiving results

were significantly more likely than those in the CVCT arm to have experienced domestic violence ever and in the past six months (results not shown).

Results from a subgroup analysis of HIV-positive women who completed the follow-up questionnaire are reported in Table 2. Compared to HIV-positive women in the IVCT arm, the 11 women who completed CVCT had slightly lower levels of marital dissolution and domestic violence since testing. Reported experience of domestic violence at baseline was not associated with reported domestic violence since HIV testing at follow-up; therefore, the domestic violence estimates in Table 2 are not adjusted for domestic violence reported at baseline. Women in the CVCT subgroup were more likely to have received nevirapine (55 vs. 24%, $p = 0.07$), as were their infants (55 vs. 22%, $p = 0.06$) and to have used abstinence or condoms for protection since testing positive (90 vs. 60%; $p = 0.14$), as compared to women in the IVCT study arm. Although the differences between the two subgroups are large, they are not statistically significant (at the $p < 0.05$ level) due to the small size of the samples. Given the *p*-values of 0.07 and 0.06 for nevirapine received by the mother and infant, respectively, one could conclude that hypothesis 3 is partially supported.

Discussion

In this study only 16% of women randomized to the CVCT arm came to the clinic with their husbands, counseled, tested, and shared HIV test results together. Furthermore, 51% (391/760) of consented women randomized to the CVCT arm did not return to the antenatal clinic—in a setting where most women return for subsequent antenatal visits. Including women in the CVCT arm who opted for IVCT, the percentage testing and receiving results was only 39% compared to 71% in the IVCT arm, a significant difference.

Levels of couple involvement in VCT have been low in sub-Saharan Africa and this is particularly true for antenatal clinic-based VCT. In a Nairobi clinic women were asked to return to the clinic and they were given a choice of coming alone or with their partners. Only 5% (166/2,231) of the sample returned with partners and completed CVCT [14]. In two antenatal clinics in Lusaka, only 9% of women presented with husbands despite community outreach activities promoting CVCT [16]. Given research findings published since our study began, and the study context, it is not surprising that participation in CVCT was low in this study. The first hypothesis, that offering CVCT will not

Fig. 1 Study flow diagram

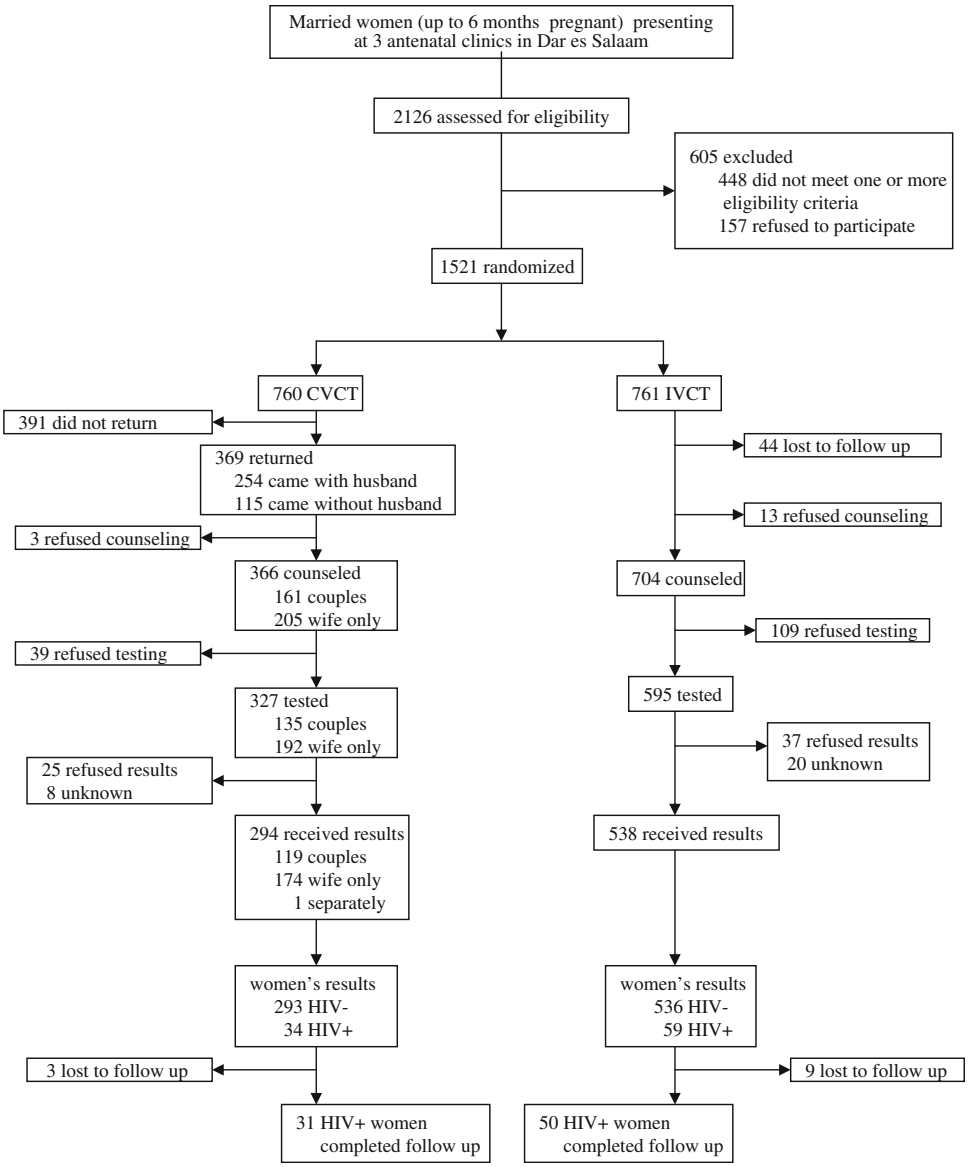

Table 2 Percent of HIV+ women with selected outcomes postpartum reported in follow up survey, by study group

Postpartum outcome	All HIV+ women with follow-up ($n = 81$)	ICVT arm ($n = 50$)	CVCT arm ($n = 31$)	
			Received IVCT ($n = 20$)	Received CVCT[c] ($n = 11$)
Lives with husband (%)	84	80	90	91
Experienced domestic violence since testing (%)	10	14	0	9
Using protection for HIV since testing[a] (%)	69	60	78	90
Nevirapine treatment received				
By mother (%)	25	24	10	55
By child[b] (%)	24	22	11	55

[a] Includes condom use and abstinence. $n = 71$ as some women were no longer living with their husbands at the time of follow-up

[b] $n = 79$ as some infants did not survive

[c] Complete CVCT is interpreted here as receiving counseling, testing, and test results as a couple

decrease acceptance of VCT was thus rejected. We note that women randomized to IVCT could receive it immediately while those randomized to CVCT could only receive it at a subsequent visit. This was a major limitation of this study inherent in the study design. Although we can only generalize to other antenatal clinics in Dar es Salaam, this finding of low CVCT acceptance is consistent with research in other settings in sub-Saharan Africa.

In a comparison of the women randomized to CVCT, we found that the women who completed CVCT were significantly younger than those randomized to CVCT but who did not complete CVCT. This finding provides partial support for hypothesis 2.

Nevirapine use was low among the HIV-positive women in both study arms. This could be due to the fact that many of these women feared the stigma associated with the potential breach of confidentiality upon receiving nevirapine in the local hospital—so they opted to deliver elsewhere. The Johns Hopkins School of Public Health IRB required that nevirapine be given to study participants at the hospital at the time of delivery; therefore, it was not possible to give women the preventive treatment at the clinic prior to delivery.

At follow-up, HIV-positive women who had CVCT reported higher rates of protective sexual behaviors and nevirapine use, as well as lower rates of violence and marital disruption, than HIV-positive women in the IVCT arm. However, these differences were not statistically significant and are likely the result of selection effects; in particular, women who were committed to return and test with their partner would also be more likely to be committed to using protection and MTCT prevention. The achieved sample size was too small to provide adequate power to detect all but very large differences in outcomes for HIV-positive women in the two study arms. Thus, from this study, there is partial support for hypothesis 3 but a larger study is needed to confirm these findings.

Previous research has shown that a sizable proportion of women who test HIV-positive at antenatal clinics do not disclose their results to their husbands, due to fear of violence, abandonment and/or divorce during this vulnerable time [23–28]. A possible alternative in this study would have been to offer all women IVCT at the clinic prior to asking half of them to return to the clinic for CVCT; however, this scenario is problematic given that women fear abandonment and violence with HIV results disclosure if they are HIV-positive. Specifically, asking them to first receive IVCT would likely deter those who test positive from returning to the clinic for CVCT. One major advantage of CVCT is that women and men in partnership are assisted with disclosure by counselors. In addition, the counselor is able to facilitate discussion before and after disclosure to reduce fears and the probability of negative consequences [4, 6].

From these results and those of other studies of CVCT, several recommendations can be made. First, community mobilization is necessary for CVCT acceptance to increase. In this regard, the campaign for VCT that was launched in 2007 by Jakaya Mrisho Kikwete, the President of Tanzania, has inspired participation in CVCT because he and his wife tested and received their results together publicly in promotion of CVCT [29]. A study at one VCT center in Lusaka, Zambia showed how numbers accessing CVCT waxed and waned over six years in tandem with promotional activities [8]. Another study found increased uptake of CVCT after public endorsement followed by a personal invitation [30]. Thus, continuous community advocacy appears essential to achieve sustained CVCT use.

Second, CVCT is not appropriate for some couples. Specifically, it is crucial that both partners are willing to participate in CVCT. Of considerable debate is whether CVCT is or is not appropriate for couples with a history of domestic violence. While a priori one might think such couples should be excluded, there is a cogent counter-argument: a woman in such a couple (especially one in a discordant couple where she is HIV-positive) would probably be safer having test results shared in front of a trained counselor as opposed to disclosing to her partner alone or not disclosing and risking his finding out later when AIDS symptoms become apparent. In this study, history of domestic violence was not an exclusion criteria; however, individuals were asked to consent at the start, then received results as individuals and were asked to consent again to share (or not) results with the partner. In fact, there was a selection effect in that women who participated in CVCT were less likely to have a history of domestic violence than women who participated in IVCT. A key criterion for VCT is the voluntary nature of the process; the CVCT counselor needs to be sensitive to cases in which an individual in a couple appears to be participating involuntarily.

Third, settings other than antenatal clinics may be preferred for CVCT due to perceptions that antenatal clinics are a 'woman's place' and the fact that women are especially vulnerable during pregnancy. In the present study, all three clinics had both weekend and evening hours to accommodate men's work schedules. However, a more neutral setting such as a pharmacy or stand-alone VCT clinic would likely attract more couples given the cultural emphasis on antenatal clinics as places serving only women. Alternatively, one could offer CVCT in a mostly male workplace, asking men to bring in their partners. One study of such an intervention in Zimbabwe had low participation rates, but that could be due to a two-week waiting period and displacement to another site to receive

test results [31]. Another possibility is to offer testing, inclusive of CVCT, in homes [30]. Home-based VCT has been successful in Uganda [3, 32].

More generally, couple-friendly services are needed in multiple settings in order to increase CVCT acceptance and use. Since the VCT acceptance rates were comparable between CVCT women who returned and women randomized to IVCT, this reinforces, in conjunction with the low overall CVCT acceptance rate, that VCT should be offered at the first encounter and couples should be encouraged to visit testing sites together. The advantages of CVCT are many, but further studies are needed to determine the best modalities for its delivery so its full potential can be realized.

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