

Adolescent girls and young women living with HIV: preconception counseling strategies

Deborah L Jones¹
 Marisa Echenique¹
 JoNell Potter²
 Violeta J Rodriguez¹
 Stephen M Weiss¹
 Margaret A Fischl³

¹Department of Psychiatry and Behavioral Sciences, ²Department of Obstetrics and Gynecology, ³Department of Medicine, Division of Infectious Diseases, University of Miami Miller School of Medicine, Miami, FL, USA

Background: Rates of pregnancy among women living with HIV are similar to those in the general population. Unintended pregnancies are also common, and among adolescents and young women perinatally infected (PHIV+) or behaviorally infected (BHIV+) with HIV, planning for both conception and contraception is an important element of HIV care that may be neglected. This pilot study examined the influence of intervention strategies targeting fertility planning, safer conception practices and patient-provider communication. It was hypothesized that preconception counseling interventions would enhance reproductive knowledge, planning and practices, as well as stimulate discussion with providers regarding conception.

Methods: Adolescent girls and young women (N=34) perinatally (n=21) or behaviorally (n=13) infected with HIV, aged 16–29 years, were recruited from urban South Florida, and completed measures of reproductive knowledge, sexual practices and fertility intentions. Participants were randomized to condition, ie, video presentation plus Motivational Interviewing (MI), MI only, control.

Results: The average age of women was 22 years (SD =3.27), and the majority of them were African American. Levels of depression were higher among BHIV+ compared to PHIV+ at baseline and 6 months. Pregnancy knowledge (pregnancy, safe conception and pregnancy planning) and the proportion of those engaging in birth control planning (condom use, long-term birth control, patient-provider discussions on preventing pregnancy and fertility desires) were similar between conditions at post-intervention and 6 months. Bayes factors indicated that the data were insensitive with regard to differences between conditions, limiting support for both the null and alternative hypotheses.

Conclusion: The impact of interventions used in this study to stimulate pregnancy planning was inconclusive. Results suggest that pregnancy planning interventions may require greater intensity to influence sexual behavior in this population. Despite adequate reproductive knowledge, HIV-infected adolescent girls and young women may fail to engage in planning behavior.

Keywords: adolescents, young women, HIV, reproduction, family planning, safer conception, preconception counseling

Introduction

Rates of pregnancy among women living with HIV (WLHIV) are similar to those in the general population, and most pregnancies are unplanned.¹ Unintended pregnancies are also common among adolescents and young women perinatally infected (PHIV+) or behaviorally infected (BHIV+) with HIV, and planning for both conception and contraception is an important element of HIV care that may be neglected. The majority of PHIV+ adolescent girls and young women are of reproductive age and many are sexually active and having children;² 22% of new HIV infections are among adolescents and young women aged 13–24 years.² Adolescents and young women with perinatally

Correspondence: Stephen M Weiss
 Department of Psychiatry and Behavioral Sciences, University of Miami Miller School of Medicine, Dominion Towers Suite 404, 1400 NW 10th Avenue, Miami, FL 33136, USA
 Tel +1 305 243 2601
 Fax +1 305 243 2126
 Email sweiss2@med.miami.edu

or behaviorally acquired HIV report sexual debut at an early age and unprotected sex,³ and among young women with HIV aged 13–21 years, 84% identified their pregnancy as unplanned.⁴

Recent initiatives have called for integration of reproductive goals with HIV treatment, including safer conception practices that enable WLHIV to achieve reproductive health while reducing risks for partners. Preconception counseling discussions, addressing pregnancy intentions and health recommendations, and reviewing risks and benefits of conception and contraception methods may not be routinely addressed to adolescents and young women. Young women with HIV may avoid discussing their desires for pregnancy or their sexual practices due to fear of disapproval by providers,^{5,6} and provider discussions on pregnancy intentions may focus on contraception rather than on conception.⁷ The health and lives of young women are affected by social determinants such as sex differences in income and consistently worse health indicators.⁸

Preconception counseling has been associated with reduction in the risk of fetal loss, preterm delivery, low birth weight, birth defects, and vertical and horizontal transmission of HIV; information on health recommendations can be presented in a variety of modalities, eg, pamphlets, videos and counseling. Motivational Interviewing (MI) is a collaborative, person-centered counseling method that has been shown to promote behavioral change among individuals living with HIV. MI is designed to strengthen motivation for change, identifying ambivalence within the individual to facilitate change from the patient's perspective. MI is empathic and nonjudgmental; when patients resist change, the practitioner "rolls" with it; when the patients are ready to change, the practitioner supports their decision.⁹ Previous studies with HIV-uninfected women have utilized MI-based interventions to attempt to increase contraceptive use but have obtained mixed results.^{10–13} However, a few studies have explored the potential of using MI-based interventions to increase contraceptive use among WLHIV. Contraceptive and reproductive health care for WLHIV is suboptimal worldwide, and strategies to optimize family planning among WLHIV are needed.¹⁴

Unplanned pregnancies among WLHIV carry the risk of negative health consequences for partners and neonates, including maternal and neonatal mortality. Yet, as WLHIV may neither plan nor prevent pregnancy, holding an intention to conceive that may suddenly be actualized by inconsistent or non-existent contraception. HIV infection may be especially challenging for adolescents and young WLHIV, requiring disclosure of HIV status to family and peers and

prevention of transmission to sexual partners. This pilot study tested the influence of two methods of providing preconception counseling information, video and one-on-one counseling, on stimulating consideration of fertility intentions. It was hypothesized that using a video or MI strategies to present information targeting pregnancy planning could increase preconception knowledge, improve preconception practices and stimulate pregnancy planning discussions with providers in comparison with a control condition. It was anticipated that results from this study could inform adolescent girls and young WLHIV about preconception counseling strategies, thereby enhancing positive health outcomes for women, partners and neonates.

Methods

Participants and procedures

Prior to any study-related activities, approval from the University of Miami Miller School of Medicine Institutional Review Board was obtained. Adolescents and young WLHIV (N=34) were recruited from University of Miami Miller School of Medicine Pediatric Immunology Clinic, the Miami Women's Interagency HIV Study (WIHS) site, community health centers, outpatient clinics at public and private hospitals and by word-of-mouth in urban South Florida. Participants consisted of two subgroups of women: n=21 PHIV+ and n=13 BHIV+. Criteria for participation were the following: age 16–29 years, female, HIV infected, fluent in spoken English, reading at or above a 6th grade level, sexually active in the last 6 months and capable of conception with no history of tubal ligation or hysterectomy. Primary reasons for ineligibility were related to age (n=36), lack of sexual activity in the past 6 months (n=4) or HIV serostatus (n=17). Prior to obtaining written informed consent, study staff reviewed the study in detail with each participant; informed consent was obtained from women aged 18 years and older; parental or guardian consent and participant assent were obtained from those aged 16–17 years. Following provision of consent, participants were randomized to either the control or an intervention condition and completed an audio computer-assisted survey instrument (ACASI) in English in a private room in the study offices. Study personnel guided the participant in learning to use the ACASI and were available in the next office at all times for assistance. Following completion of the survey, Session 1 was held, ie, intervention or control condition. The survey required 30–45 minutes, and the intervention and control conditions were 60 minutes in duration for each session. At the post-intervention visit, participants completed a follow-up survey and then Session 2. All participants were compensated USD

\$40 for time and transportation to the site at each study visit, ie, baseline, post-intervention and 6-months.

Intervention conditions

The intervention was based on established preconception counseling recommendations;^{15,16} it was developed in a previous pilot study by health care providers in psychology and obstetrics/gynecology, and supplemented by informal groups and discussions with hospital health care providers, scientists and patients. Intervention materials were tailored to a 6th grade reading level and were reviewed collaboratively by the team for “fit” with the population. Intervention Session 1 was provided using either a DVD format or a one-on-one counseling format. Both versions of the intervention session addressed fertility, planning, safer conception and contraception, 1) presenting recommendations for healthy conception (steps to be taken prior to conception, eg, adherence and viral load suppression in both partners or the woman, use of maternal supplements, revision of ART regimen, safer conception methods), 2) encouraging consideration of fertility intentions and 3) encouraging consideration of their current contraception method (long- or short-term) as appropriate to their fertility intentions.

The one-on-one counseling format integrated MI strategies in the presentation of the preconception counseling information. The MI component utilized MI strategies, including expressing empathy, identifying positive elements of target behaviors, discussing discrepancies between current behavior and goals, supporting positive behavior, promoting decision making, goal setting, exploring ambivalence and using change talk and reflecting.¹⁷ Intervention Session 2 utilized one-on-one MI strategies and focused on fertility desires, a plan for safer conception or selection of an appropriate contraceptive based on their own plan, and initiation of preconception communication with their provider.

Control condition

Control condition participants viewed time-matched DVDs on healthy lifestyle topics, ie, stress management, exercise and nutrition.

Measures

Sociodemographics and HIV medical history

Demographic characteristics assessed included age, ethnicity, relationship status, educational attainment, employment status and monthly personal income. Behaviors, eg, the use of condoms during last sexual encounter, and discussions with providers about preventing pregnancy and pregnancy

desires were assessed using yes or no questions. Medical history items included birth control methods.

Depression

The Beck Depression Inventory-II (BDI-II)¹⁸ measured depression in the past week. The BDI-II is a 21-item scale that assesses the frequency of depressive symptomatology, eg, sadness, past failures guilt and suicidal ideation. The scores for each of the items are summed, such that higher scores represent presence of greater depressive symptoms. Prior psychometric assessments¹⁸ of the BDI yielded excellent internal consistency ($\alpha=0.91$). The BDI-II has been validated for use among HIV-infected patients.¹⁹

Contraceptive and pregnancy knowledge

The Fog Zone²⁰ is a 23-item measure and assessed conception, pregnancy and contraception knowledge. The Fog Zone is composed of five subscales: condoms, birth control, intra-uterine devices, other hormonal methods and pregnancy. Items are presented as true or false questions, such as “A woman who is still breast feeding cannot get pregnant,” and are then scored as correct or incorrect. The total score correct ranges from 0 to 27, higher scores indicating greater knowledge.

Safer conception practices knowledge

This three-item scale assessed knowledge of safer conception practices. Participants checked all practices that could be used to minimize the risk of infecting their partner with HIV. One point was assigned for every safe conception practice selected. Total scores ranged from 0 to 14, higher scores indicating greater knowledge.

Pregnancy planning knowledge

An adapted version of the London Measure of Unplanned Pregnancy²¹ was used to assess pregnancy planning. Questions on this 6-item scale included “Before you become pregnant, do you do anything to improve your health in preparation for pregnancy?” Each question was scored 0, 1 or 2 (no, don’t know, yes). A total score of 0–3 represents lack of intentions to plan, 4–9 represents ambivalent intentions and 10–12 denotes an intention to plan for pregnancy.

Statistical analyses

Univariate descriptive analyses were conducted to describe demographic characteristics. Demographic differences between conditions at baseline were assessed using chi-square or Fisher’s exact test and *t*-tests or Mann–Whitney *Z* tests.

Given that no significant differences were found between the video presentation plus MI and MI only groups over time and the similarity in session delivery and virtually identical protocols (with the exception of video vs one-to-one presentation), the two experimental conditions were merged to increase sample size and power in subsequent analyses when comparing the effects of the experimental conditions versus control. Generalized linear mixed models (GLMMs) in combination with an unstructured covariance matrix – to model the dependency between repeated measures – were used to compare intervention versus control conditions over time (interaction of time \times condition) across different domains of knowledge (contraception and pregnancy, safe conception and pregnancy planning) and practices (condom use at last sexual encounter, use of long-term birth control and discussions with providers about preventing pregnancy and fertility desires). A similar procedure was utilized to test an interaction of time \times method of infection to assess levels of depressive symptomatology at baseline and 6 months; differences in levels of depressive symptoms between conditions were not tested given that the intervention was neither designed nor hypothesized to impact depression, but depression was believed to differ by mode of infection. For proportions, a binomial distribution and a logit link were specified. Results from GLMMs were followed by least square mean comparisons to test for differences between conditions at post-intervention and 6 months. A threshold of $P < 0.05$ was used to determine statistical significance.

Bayes factors (B_s) for comparisons at each time point were also calculated. As opposed to P -values, which do not provide evidence for the null hypothesis, B_s can enhance the interpretation of results by quantifying evidence in favor of the alternative hypothesis (ie, difference between conditions is not zero) versus the null hypothesis (ie, difference between conditions is zero). Conventional cutoffs dictate that B_s less than 1/3 provide evidence in support of the null, values between 0.33 and 3 indicate data insensitivity and $B_s > 3$ are interpreted as evidence in favor of the alternative hypothesis.²²

SAS software v9.4²³ for Windows 7 was used for analyses. To calculate B_s , Dienes'²⁴ B calculator was used.

Results

Demographic characteristics of participants

Participant ages ranged from 17 to 28 years, with a mean of 22 years ($SD = 3.27$). Most women were African American (71%), and two-thirds had never been married and were not in a relationship (62%). Half of the participants had not

completed high school, most (85%) were unemployed, and nearly two-thirds had a monthly personal income of less than \$600. On average, participants had been diagnosed with HIV for 14 years ($SD = 9.33$). PHIV+ women had been diagnosed at birth, for an average of 21 years ($SD = 3.41$), whereas BHIV+ women had been diagnosed for an average of 4 years ($SD = 4.21$) ($P < 0.001$). No statistically significant differences between intervention and control groups were observed at baseline (Table 1). Participant retention was 97% at post-intervention and 91% at 6 months.

Comparison of depression between perinatally and behaviorally HIV-infected women

At baseline, according to BDI-II scores, BHIV+ women reported greater depressive symptomatology compared to PHIV+ women ($M = 22.92$ vs $M = 14.10$; $P = 0.043$), and this difference approached significance at 6 months ($M = 21.83$ vs $M = 12.68$; $P = 0.073$). At both time points, BDI-II scores were consistent with mild depression for PHIV+, and moderate depression for BHIV+.

Changes in knowledge and practices over time by condition

Knowledge

Knowledge including contraception and pregnancy, safe conception and pregnancy planning were similar between conditions at post-intervention and 6 months. B_s for knowledge of contraception and pregnancy showed evidence supporting the null hypothesis over the alternative hypothesis for both post-intervention and 6 months, suggesting that the difference between conditions was truly zero. B_s for safe conception and pregnancy planning knowledge, on the other hand, showed that the data were insensitive, limiting support for both the null and alternative hypotheses (Table 2).

Practices

The proportion of participants who had used a condom during their last sexual encounter was not significantly different between control and intervention conditions at post-intervention and 6 months. In addition, the proportion of women who had discussed preventing pregnancy and fertility desires with provider, as well as those on long-term birth control, was similar between control and intervention conditions at post-intervention and 6 months. B_s for the difference between conditions in the proportions of participants who were using condoms, were on long-term birth control regimens, and had discussed preventing

Table 1 Sociodemographic characteristics by control and intervention conditions (N=34)

Characteristic	All	Control (n=10)	Intervention (n=24)	t/ χ^2 , P-value
Age (years), mean (SD)	22.09 (3.27)	23.30 (3.30)	21.58 (3.19)	1.42, 0.166
Ethnicity, n (%)				
Hispanic	3 (8.8%)	1 (10.0%)	2 (8.3%)	
African American	24 (70.6%)	6 (60.0%)	18 (75.0%)	
Haitian/Haitian American/Haitian Bahamian	4 (11.8%)	2 (20.0%)	2 (8.3%)	
Non-Hispanic White	1 (2.9%)	0 (0.0%)	1 (4.2%)	
Other	2 (5.9%)	1 (10.0%)	1 (4.2%)	1.89, 0.737 ^a
Relationship status, n (%)				
Never married	21 (61.8%)	6 (60.0%)	15 (62.5%)	
In relationship	11 (32.4%)	4 (40.0%)	7 (29.2%)	
Married	2 (5.9%)	0 (0.0%)	2 (8.3%)	1.10, 0.854 ^a
Educational level, n (%)				
Less than high school	17 (50.0%)	4 (40.0%)	13 (54.2%)	
High school	17 (50.0%)	6 (60.0%)	11 (45.8%)	0.57, 0.452
Employment status, n (%)				
Not employed	29 (85.3%)	10 (100.0%)	19 (79.2%)	
Employed	5 (14.7%)	0 (0.0%)	5 (20.8%)	2.44, 0.291 ^a
Monthly personal income (USD), n (%)				
Less than \$600	20 (60.6%)	7 (70.0%)	13 (56.5%)	
More than \$600	13 (39.4%)	3 (30.0%)	10 (43.5%)	0.53, 0.466 ^a
Want baby, n (%)				
No	20 (58.8%)	4 (40.0%)	16 (66.7%)	
Yes	14 (41.2%)	6 (60.0%)	8 (33.3%)	2.07, 0.252 ^a
Time since HIV diagnosis (years), mean (SD)	14.35 (9.33)	14.40 (9.87)	14.33 (9.31)	0.80, 0.832 ^b

Notes: ^aFisher's exact test was used. ^bMann-Whitney test was used.

pregnancy and fertility desires with their provider indicated that the data were inconclusive, suggesting inadequate evidence to support either the alternative or null hypotheses (Table 2).

Discussion

This pilot study explored the impact of providing preconception counseling information on consideration of fertility intentions among adolescents and young WLHIV. Contrary to hypothesis, interventions targeting pregnancy planning did not have an impact on conception and pregnancy knowledge exceeding that reported in the control condition. However, *Bs* derived from the analyses of safe conception and pregnancy planning knowledge suggest that the hypothesis was not ruled out with regard to these outcomes. Similarly, *Bs* derived for analysis of condom use, long-term birth control and discussions of fertility desires and contraception with providers suggest that the hypothesis was not ruled out for these outcomes. There were no substantial deviations between the results of *Bs* and the classical analysis and the two analyses reached many of the same conclusions. However, in those analyses in which no conclusive outcome was obtained, the benefit of *Bs* is illustrated.²² *Bs* may have been protective against drawing spurious conclusions, arising from

the fact that more weight is given to data as the sample size increases. Thus, the potential of the interventions to increase contraceptive use, knowledge and discussions with providers cannot be ruled out.

Within this ethnically diverse sample, many women endorsed wanting to conceive; a minority of women utilized long-term birth control methods, though most endorsed condom use at their last sexual encounter. Overall, knowledge regarding pregnancy, conception and contraception was high and as anticipated, more women had discussed pregnancy prevention with providers than pregnancy planning. The need for discussion of pregnancy planning appears supported. While not a focus of the current study, it is important to highlight the presence of mild to moderate depression among many girls and young women, which may put this group of WLHIV at risk for nonadherence to antiretrovirals²⁵ and discontinuity of care.²⁶ Of special interest is the consistently greater severity of depression among BHIV+ women, perhaps due to the temporal proximity of their diagnosis, in contrast to PHIV+. This outcome underscores the importance of long-term support services for the growing numbers of adolescents and young WLHIV and the need for inclusion of mental health services in HIV care to maximize adherence to antiretrovirals and optimize health outcomes.^{14,27}

Table 2 Comparison of control and intervention groups over time

	Control (n=10)			Intervention (n=24)			Post Control vs intervention t, P-value	B	6-month Control vs intervention t, P-value	B
	Baseline (n=10) Mean (SE)	Post (n=9) Mean (SE)	6-month (n=9) Mean (SE)	Baseline (n=24) Mean (SE)	Post (n=24) Mean (SE)	6-month (n=22) Mean (SE)				
Knowledge										
Contraception and pregnancy	21.30 (1.10)	21.49 (1.44)	21.50 (1.19)	21.53 (0.70)	21.03 (0.89)	21.24 (0.75)	0.27, 0.787	0.25	0.19, 0.849	0.21
Safe conception	9.30 (1.00)	8.71 (1.07)	9.33 (1.08)	8.12 (0.64)	8.60 (0.66)	8.20 (0.67)	0.08, 0.934	0.34	0.89, 0.380	0.48
Pregnancy planning	7.40 (0.82)	8.03 (0.93)	6.55 (0.95)	6.71 (0.53)	6.43 (0.59)	7.03 (0.60)	1.45, 0.155	0.88	-0.42, 0.674	0.38
Practices										
Condom use (proportion)	0.72 (0.16)	0.70 (0.17)	0.63 (0.22)	0.60 (0.12)	0.73 (0.11)	0.57 (0.13)	-0.14, 0.889	0.84	0.24, 0.809	0.87
Using long-term birth control (proportion)	0.10 (0.10)	0.10 (0.10)	0.32 (0.16)	0.20 (0.08)	0.24 (0.09)	0.20 (0.08)	-0.85, 0.396	0.96	0.70, 0.488	0.89
Discussed preventing pregnancy with provider (proportion)	0.80 (0.13)	0.80 (0.14)	0.81 (0.14)	0.75 (0.09)	0.96 (0.04)	0.86 (0.07)	-1.36, 0.183	1.07	-0.57, 0.545	0.90
Discussed fertility desires with provider (proportion)	0.60 (0.16)	0.68 (0.16)	0.90 (0.10)	0.71 (0.09)	0.80 (0.09)	0.81 (0.09)	-0.66, 0.513	0.88	0.57, 0.572	0.93

Note: B = Bayes factor.

Addressing psychological health in reproductive health care may contribute to reducing risk as well as increasing protective factors for unplanned pregnancy.⁸

This study utilized two strategies for providing preconception counseling information to stimulate consideration of fertility intentions: video and one-on-one MI. Though neither had an effect exceeding that of the control condition, the utility of both strategies cannot be ruled out. In previous studies among HIV-uninfected women, MI-based interventions have not been effective in increasing condom and contraceptive use, provider visits or satisfaction with services,^{10,12} while others have shown notable and promising benefits.^{11,13} Similarly, while some interventions have demonstrated increases in contraceptive use, pregnancy rates have remained unchanged.^{12,28} Future research should explore the utility of video presentations in venues such as clinic waiting rooms as a stimulant to promote contraceptive and reproductive patient-provider discussions. The use of mobile technologies, eg, multimedia applications, to provide contraceptive counseling in waiting rooms have proved effective among racial minorities and increased contraceptive knowledge and intentions; these methods may be worth exploring among WLHIV.²⁹ Similarly, MI remains a useful vehicle for facilitating behavioral change and utilizing patients' energy to address their own ambivalence regarding challenging behaviors such as pregnancy planning.

This analysis was primarily limited by its small sample size. While it may be tempting to conclude that the interventions had no effect, the results may be due to data insensitivity, as the use of *Bs* suggested inadequate evidence to support either the alternative or the null hypotheses.²² Additionally, the study utilized self-report of sexual behavior and patient consult, both of which are impacted by recall. Though computerized data collection strategies such as the ACASI system used in this study have been shown to reduce social desirability bias,³⁰ results should be interpreted with caution.

This study illustrated the need for ongoing preconception counseling discussions with adolescents and young WLHIV. Strategies to stimulate discussions during patient consultations and enhance contraceptive and reproductive health care among WLHIV should be explored, as their implementation could play an important role in enhancing positive health outcomes for women, partners and neonates.¹⁴

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Disclosure

The authors report no conflicts of interest in this work.

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