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Sexual risk behaviour among HIV-infected women in the first twelve months after delivery in South Africa

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Abstract

This study aimed to assess sexual risk behaviour and its social correlates in HIV-infected women living in rural South Africa at six and twelve months post-partum. Participants were 699 HIV-positive women recruited prenatally by systematic sampling from twelve community health centres in Mpumalanga province, South Africa (mean age = 28.4 years, SD = 5.7; married = 41.1%; serodiscordant or unknown partner status = 74.9%). They self-reported on their sexual activity six to twelve months after delivery; including use of condoms and partner involvement. Generalised linear mixed models were utilised to estimate unsafe sex outcomes from a prevention of mother to child transmission (PMTCT) intervention, socio-demographic factors, disclosure, and male involvement. About 20% of sexually active women in the past week had used condoms inconsistently at six and twelve months after delivery. Moreover, 16% and 18% of the women had not used a condom at last sex and 11% and 13% had unprotected sex with HIV-uninfected or unknown-status partners following delivery at six and twelve months, respectively. Higher

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inconsistent condom use was likely with lower male involvement. Promotion of condom use post-partum, as well as male involvement in sexual decisions, are important for safer sex post-partum by seropositive women.

Keywords

sexual risk behaviour; HIV-infected women; postnatal period; South Africa

Introduction

New mothers in high HIV pandemic regions may be particularly vulnerable to unsafe sexual practices, considering that a large proportion of couples may be serodiscordant (Eyawo et al., 2010). There is a dearth of studies on sexual risk behaviour among HIV-infected new mothers. For example, 39% of HIV-infected new mothers in Burkina Faso and Kenya (Irungu et al., 2012), 38% in Kenya (Bii, Otieno-Nyunya, Siika, & Rotich, 2008), and 31.9% of HIV-infected new mothers in South Africa reported “unsafe sex with an HIV-uninfected or unknown-status partner” (Peltzer, 2014, p. 186). Understanding the prevalence and possible predictors of sexual risk behaviour among HIV-positive new mothers is of great importance, as this information will be crucial in positive prevention efforts (Shukla et al., 2016).

Risk factors for unsafe sex among HIV-infected women post-partum include: younger age (Irungu et al., 2012); being unmarried (Bii et al., 2008); less-advanced HIV disease (Irungu et al., 2012); lack of male involvement (Peltzer, 2014); not disclosing their HIV status (Bii et al., 2008; Irungu et al., 2012; Peltzer, 2014); and mood disorder (Cunningham et al., 2016). Younger age, healthy, and unmarried women may be exposed to greater pressure to engage in sexual reproductive activities. Furthermore, a lack of sexual negotiation and communication and non-disclosure of one HIV status will increase sexual risk behaviour. Having depression symptoms might hamper self-determination and negotiation skills leading to more risky sexual behaviours.

Longitudinal studies are needed to examine sexual HIV risk behaviour and its social correlates among HIV-infected new mothers. By doing so, one would be able to more effectively learn about cause and effect relationships; including intervention effects. The present study aimed to assess sexual activity, use of condoms, and HIV status disclosure among HIV-infected women from Mpumalanga, South Africa at six and twelve months after delivery. Based on the latest National Antenatal Sentinel HIV Prevalence Survey (2013) among women 15–49 years, the HIV prevalence was 37.5% in Mpumalanga province (national 29.7%) (Department of Health, 2015). We hypothesised that post-partum women would engage in sexual risk behaviour mitigated by male involvement, HIV status disclosure, and a prevention of mother to child transmission (PMTCT) intervention.

Methods

Study design

This study was a part of a clinic-randomised PMTCT controlled trial recruiting HIV-infected women prenatally (8–24 weeks pregnant) and which conducted two assessments post-natal (six and twelve months). The trial was aimed at increasing prevention of mother to child transmission (PMTCT) uptake in the antenatal and post-natal process in twelve community health centres in rural Mpumalanga province, South Africa (Jones et al., 2012). More specific details on the study design are available from Peltzer and colleagues (2017).

Sample and procedure

Eligible women were HIV-seropositive pregnant women with partners, between eight and 24 weeks pregnant, aged 18 years or older. Exclusion criteria included not having a partner, below 18 years, and actively psychotic or intoxicated.

At baseline (8–24 weeks pregnant), 699 pregnant HIV-infected women with a male partner were recruited. More than half (54.1%) had been diagnosed with HIV during the current pregnancy, and 59.0% had disclosed their HIV status to their partner. The majority (79.8%) had one or more children, and 81.5% had a live birth (see Table 1).

Enrolled women completed study measures in English, isiZulu, or seSotho using “Questionnaire Development System” v3.0 (QDS™) “Audio Computer-Assisted Self-Interview (ACASI) software” (NOVA, 2013).

The Human Sciences Research Council (HSRC) Research Ethics Committee (REC) granted ethics approval for the study (protocol approval number REC4/21/08/13). Study approval was also obtained from the Department of Health and Welfare, Mpumalanga Provincial Government, South Africa and the University of Miami Miller School of Medicine Institutional Review Board (IRB ID: 20130238 (CR00006122)). Additionally, the study was registered as a clinical trial: clinicaltrials.gov: number NCT02085356. All participants granted written informed consent for the study.

Measures

Socio-demographic factors included, age, education, income, partner status, and number of children. HIV-related issues assessed included time of diagnoses of HIV, partner HIV status, HIV status of children, and HIV status disclosure (Jones et al., 2014).

Sexual risk factors were assessed using a 16-item scale adapted from the Sexual Risk Behaviour Assessment Schedule (Meyer-Bahlberg et al., 1990) that assessed the number of unprotected sexual intercourse occasions (i.e. with or without male or female condom use) for one week prior to each assessment, using timeline-follow back type cues for recall.

HIV knowledge (Carey & Schroder, 2002) measures included questions on HIV transmission, condom use, PMTCT, and AIDS. HIV knowledge was assessed using 18 items adapted from the HIV Knowledge Questionnaire. HIV knowledge was scored for the number of correct responses (Yes, No), with Don't Know responses scored as incorrect

(score 1 or 0), and the possible range of scores 0 to 18 expressed as the percentage correct. Cronbach's alpha ranged from 0.59 to 0.74 at the different assessment points.

Partner issues measures surveyed disclosure of HIV status to partner, HIV status of partner, consistence of condom use, psychological partner violence victimisation (Cronbach's alpha = 0.83), physical partner violence victimisation (Cronbach's alpha = 0.94) (Conflict Tactics Scale 18, adapted; CTS-18; Straus et al., 1979), and an 11-item male involvement index (Cronbach's alpha 0.78 to 0.84 at the different assessment points) (Jones et al., 2014). Male involvement included items around issues of antenatal and postnatal care, PMTCT, and condom use discussion.

Depressive status was assessed using an adapted version of the Edinburgh Postnatal Depression Scale 10 (EPDS-10; Cox, Holden, & Sagovsky, 1987) to assess perinatal depression. The EPDS-10 is a 10-item instrument asking participants to rate how often they have experienced different symptoms associated with depression in the past seven days. Scores range from 0 through 30; the validated cut-off score for South African populations is 12 (Lawrie, Hofmeyr, de Jager & Berk, 1998). Cronbach's alpha for the EPDS-10 scale was 0.80 in this study sample.

Data analysis

All data analyses were conducted using Mplus (version 7.4) (Muthén & Muthén, 2014). A multivariable logistic regression model was built, adjusting for the variables identified using the procedure above and those associated with attrition. The intraclass-correlation (ICC) for CHCs was accounted for using random effects (i.e., random intercept and random slope model), in which the covariance between random intercept and random slope were fixed to 0. Odds ratios were calculated and used as effect sizes (Allen & Le, 2008). Missing data was handled using multiple imputation technique (Asparouhov & Muthén, 2010), specifying ten imputed datasets.

Attrition analyses showed that more educated participants (odds ratio [OR] = 0.82, $p < 0.01$), and those with an HIV-infected infant (OR = 0.64, $p < 0.10$) were less likely to drop out of the study; these two variables were included as covariates in the final analyses evaluating associations with unprotected sex and condom use. Participants' age, monthly income, having an HIV-infected partner, disclosure of serostatus to partner, and relationship status were not associated with attrition.

Results

Sample characteristics at baseline

At baseline, the study included 699 pregnant (8–24 weeks pregnant) HIV-positive women who had a partner. More than half (54.1%) had been diagnosed with HIV during this current pregnancy, and 59.0% had disclosed their HIV status to their partner. The majority (79.8%) had one or more children, and 81.5% had a live birth (see Table 1).

Sexual behaviour after delivery

Almost two in five women had been sexually active in the past week at six and at twelve months after delivery. About 20% of the women had inconsistently used condoms in the past week at six and twelve months after delivery, and 15.8% and 17.8% had not used a condom at last sex at six and twelve months, respectively. Among the sexually active women, 15% engaged in unsafe sex (inconsistent condom use with negative or unknown status partner) in the past week at six and twelve months post-delivery (see Table 2).

Predictors of unsafe sex

In multivariable binomial logistic regression, HIV disclosure to the partner approached significance in being associated with unprotected last sex with negative or unknown status partner, and inconsistent condom use with negative or unknown status partner was associated with lower male involvement. The intervention did not influence neither of unprotected last sex with negative or unknown status partner, nor inconsistent condom use with negative or unknown status partner (see Table 3).

Discussion

This study of a large sample of HIV-infected sexually active new mothers in rural South Africa found that about 20% of women reported unsafe sex with an HIV uninfected or unknown-status partner. These modest rates were less than those identified in previous studies (Bii et al., 2008; Irungu et al., 2012; Peltzer, 2014; Tavengwa et al., 2007). It is possible that HIV-positive women in the current study were more likely to be on lifelong antiretroviral therapy, hence more aware of the potential risks of unprotected sex leading to lower rates of sexual risk behaviour.

In a previous study Peltzer (2014) reported increased male involvement was protective from inconsistent condom use. This finding shows the importance of male (sexual) communication for condom use, and suggests the need of creating prevention interventions that increase male involvement and partner communication on sexual issues (Villar-Loubert et al., 2013).

This study did not find an association between intimate partner violence and unprotected sex. This finding was unlike the findings of some previous studies (Peltzer, 2014; Saito et al., 2012). Other studies (e.g., Hove & Gwazane, 2011) also found that concordant HIV-positive couples experienced the most intimate partner violence compared to the discordant female positive couples. It is possible that HIV negative or unknown status male partners (with or without partner violence perpetration) are more likely to have protected sex than HIV-positive male partners.

In contrast with previous studies (Bii et al., 2008; Irungu et al., 2012; Peltzer, 2014), the protective effect of HIV status disclosure from unprotected sex was only significant in bivariate analysis. This outcome may arise as HIV status disclosure to partners was only assessed prenatally, and women may have disclosed their status to partners post-natally leading to a larger protective effect from unprotected sex.

Study limitations

Although this was a longitudinal study, there was a low retention rate at twelve months post-natally, which limits the robustness of the findings. Results may have been influenced by self-selection among women who were followed to twelve months post-partum. The inclusion criteria for the study participants were limited to women who had a partner, preventing generalisation to women without partners. The use of self-reported measures limits the study, due to their potential for assessment bias.

Conclusion

Results suggest modest rates of unprotected sex with HIV-uninfected or unknown-status partners following delivery. In that regard, findings highlight the importance of promotion of condom use post-partum as well as male involvement in PMTCT as part of post-partum counselling of women and their partners by health care providers.

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Table 1

Characteristics of HIV-infected women at enrolment (8–24 weeks pregnant) in Mpumalanga, South Africa ($N = 699$)

Variable	Mean (SD) or n (%)
<i>Socioeconomic characteristics:</i>	
Age	28.4 (5.7)
Education	
Grade 0–9	149 (21.5%)
Grade 10–11	344 (49.6%)
Grade 12 or more	200 (28.9%)
Monthly household income (South African Rand)	
< 600 (~ \$50)	339 (48.9%)
600	354 (51.1%)
Number of children	
None	140 (20.2%)
One	270 (39.0%)
Two or more	283 (40.8%)
Child status after current pregnancy	
Live birth	570 (81.5%)
Died/miscarriage/abortion	54 (7.5%)
Status unknown (lost or withdrawn from study)	76 (10.9%)
Diagnosed during this pregnancy	
No	318 (45.9%)
Yes	375 (54.1%)
Fix dose combination ART	
No	15 (2.3%)
Yes	629 (97.9%)
Partner status	
Married or cohabiting	285 (41.1%)
Having partner (not married/cohabiting)	408 (58.9%)
Disclosure of serostatus (to partner)	
No	279 (41.0%)
Yes	402 (59.0%)
HIV serostatus of spouse/partner	
Negative/Do not know	510 (74.9%)
Positive	171 (25.1%)
HIV knowledge (scale, range 0–18)	13.8 (3.2)
Emotional intimate partner violence victimization	
No	303 (44.5%)
Yes	378 (55.5%)
Physical partner violence victimization (mild and severe)	
No	545 (80.0%)

Variable	Mean (SD) or <i>n</i> (%)
Yes	136 (20.0%)
Male involvement index (scale, range 0–11)	7.1 (3.1)
Depression	
No	349 (51.2%)
Yes	332 (48.8%)
Study condition	
Standard care	357 (51.1%)
Enhanced intervention	342 (48.9%)

Table 2

Sexual behaviour in women in the first 12 months after delivery

Variable	6 months after delivery	12 months after delivery
<i>Sexual behaviour in the past week:</i>		
Sexually active in the past week	139/354 (39.3%)	161/416 (38.7%)
Inconsistent condom use in past week	29/139 (20.9%)	30/161 (18.6%)
Inconsistent condom use with negative or unknown status partner	20/134 (14.9%)	23/156 (14.7%)
Inconsistent condom use with positive status partner	9/134 (6.7%)	7/156 (4.5%)
<i>Condom use at last sex:</i>		
Unprotected sex at last sex	56/354 (15.8%)	74/416 (17.8%)
Unprotected last sex with negative or unknown status partner	39/344 (11.3%)	53/402 (13.2%)

Table 3

Multivariable logistic regression of factors associated with unsafe sex with an HIV-negative or unknown status partner in the first 12 months after delivery ($N = 521$)

	Unprotected last sex with negative or unknown status partner			Inconsistent condom use with negative or unknown status partner		
	OR [95 CI%]	AOR [95 CI%]	<i>p</i>	OR [95 CI%]	AOR [95 CI%]	<i>p</i>
<i>Fixed effects:</i>						
Intervention	0.832 [0.465, 1.490]	0.987 [0.846, 1.151]	0.869	1.649 [1.007, 2.703] [*]	0.928 [0.806, 1.067]	0.291
Educational attainment (ref = up to 10 years)						
10 to 11 years	0.512 [0.240, 1.089]	0.908 [0.811, 1.015]	0.090	0.881 [0.454, 1.708]	0.976 [0.850, 1.122]	0.735
12 years or more	0.792 [0.360, 1.741]	0.958 [0.848, 1.083]	0.493	1.289 [0.615, 2.702]	1.063 [0.914, 1.236]	0.430
HIV-positive children	1.239 [0.342, 4.492]	0.949 [0.803, 1.123]	0.546		1.007 [0.803, 1.261]	0.955
Disclosure of HIV status to partner	0.395 [0.208, 0.750] ^{**}	0.911 [0.824, 1.006]	0.066	NS	NS	NS
Male involvement index	0.889 [0.810, 0.976] [*]	0.992 [0.977, 1.008]	0.335	0.936 [0.317, 2.759]	0.981 [0.965, 0.997] [*]	0.022
<i>Random effects[†]:</i>						
Intercept		0.012 (0.007)	0.068		0.003 (0.005)	0.595
Intervention		0.000 (0.002)	0.941		0.008 (0.012)	0.509
Model Fit						
-2LL (Deviance)	-755.118				-1014.006	
Number of parameters	11				10	
AIC/BIC	823.931/789.015				1034.01/1076.56	
ICC	0.118				0.118	

Note. AOR = Adjusted Odds Ratio.

[†] Random effects indicates the estimated variances from adjusted random effects logistic regression model.

*** $p < 0.001$,

** $p < 0.01$,

* $p < 0.05$