The role of reproductive coercion in women's risk for HIV: A case-control study of outpatients in Gauteng, South Africa

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Abstract

Objectives: To investigate how reproductive coercion, or men's attempts to control their partners' use of contraception, may contribute to adverse reproductive health outcomes for women including abortions, sexually transmitted infections, and HIV for young women in South Africa.

Methods: Findings are based on a case-control interview study of 882 South African women outpatients aged 15–29 years, 48.5% (n=427) of whom were HIV seropositive. Covariates include demographics, intimate partner violence, sexually transmitted infections, having an abortion, using long-acting reversible contraception, and unequal sexual relationship power.

Results: Most covariates with the exceptions of abortion and unequal relationship power increase the risk of HIV, and all relate to reproductive coercion. Intimate partner violence is strongly associated with reproductive coercion (odds ratio 3.86, 95% confidence interval 2.89–5.15). When intimate partner violence is included in the full model reproductive coercion remains a significant predictor of HIV by 42%, and acts as a partial mediator between IPV and HIV.

Conclusion: Findings confirm the significance of reproductive coercion as a risk marker for HIV. Reproductive coercion undermines women's reproductive health and warrants clinical intervention. Recommendations are offered for clinical practice within the South African context to increase training and assessment and provide covert long-acting reversible contraception as one pathway towards promoting women's reproductive autonomy.

Keywords: Contraception; HIV in Africa; Intimate partner violence; Reproductive coercion; Sexually transmitted infections

1 INTRODUCTION

There is mounting evidence that women's lack of power in heterosexual relationships fuels the HIV-AIDS pandemic in southern and Southeast Africa.[1] Gender inequities provide one explanation for the conspicuous sex differences in the dispersal of HIV across South Africa with 62% of seropositive cases attributed to women and new infections three times higher among females under 25 years compared with males of the same age group.[2] As a result, HIV symptoms occur 5–7 years earlier for seropositive women compared with men and adolescent girls die of HIV infection at disproportionate rates.[3, 4] Structural gender inequality leaves a unique imprint on South African women's lives, curbing their educational and economic opportunities and fostering dependency on men even at the cost of their health.[5] Such inequality translates into poor access to contraception and unwanted pregnancies, often cementing a cycle of poverty. In South Africa there is an unmet need for contraception with only about half of sexually active women using medical birth control.[6] Although education and access are critical to promoting effective contraceptive use,[6] some women may fail to adhere to birth control because of their partners' restrictions, a scenario rarely addressed in current research on contraception in sub-Saharan Africa.

Across the globe, intimate partner violence (IPV) threatens women's reproductive health as reflected in unintended pregnancies, abortions, and sexually transmitted infections.[7, 8] South Africa displays a similar pattern linking IPV to reproductive risk.[5] Where one in five women from rural Mpumalanga disclose partner abuse, HIV has surged as high as 21% among women under 22.[9] Another correlate of HIV in South Africa is herpes simplex virus type 2, which is widespread and acts as a portal of entry (ulcers) to HIV in sub-Saharan Africa.[10] Men's physical abuse of their partners often co-occurs with ostensibly non-violent efforts at control, such as psychological and emotional abuse,[11] economic control,[12] or coerced unintended pregnancy or sabotage of contraception, known as "reproductive coercion".[13] Reproductive coercion indexes men's intrusive efforts to manage their partners' fertility by pressuring them to become pregnant or sabotaging their attempts to use contraception.[13] It may co-occur with IPV, as observed in studies of adolescents,[14] or surface in otherwise non-violent couples.[15] How much pregnancy coercion and contraceptive sabotage account for women's reproductive morbidity remains largely unknown in sub-Saharan Africa, although in the Côte d'Ivoire 18.4% of women reported experiencing reproductive coercion triggering symptoms of anxiety and depression.[16]

Reproductive coercion affects girls and women on a global scale.[8] Because South Africa harbors the largest HIV pandemic in the world[17] it is critical to identify all potential conduits to infection. Adolescent girls and young women are vulnerable to reproductive coercion and subsequent pregnancies: in California, 12% of teenaged girls had boyfriends who regularly interfered with their use of contraception, especially when partners were substantially

older.[14] Our objectives were to test whether reproductive coercion raises the likelihood of HIV among women between 15 and 29 years of age in South Africa, and to uncover whether it intersects with other parameters of HIV risk such as physical and sexual IPV, sexual power inequality, preferred use of long-acting reversible contraception (LARC), having an abortion, or contracting sexually transmitted infections.

2 MATERIALS AND METHODS

Our research is based on a case-control one:one interview study of 882 unmatched outpatient women recruited from a township hospital and four satellite clinics, 427 (48.5%) of whom were medically confirmed as positive for HIV. Women outpatients were enrolled in the study from the township hospital and affiliated clinics within the City of Tshwane (Pretoria) in Gauteng Province. Interviewers recruited participants directly from waiting areas within hospital antenatal, gynecology, internal medicine, and pediatric clinic waiting rooms. The sample includes 427 seropositive outpatients (48.5%) and 455 (51.5%) controls. Patients were invited to participate if they were between 15 and 29 years of age, understood any of four languages (English, SeSotho-Setswana, isiZulu, or Shona), had been sexually active, and were willing to share HIV results. Prospective participants received an oral and written description of the study, which preceded the fuller description during the consent process. If women were interested we took their names and presented them to the front desk staff who conveyed their positive or negative HIV status. We therefore were able to maintain a balance of HIV-positive and HIV-negative outpatients as every day we performed our own census of the interviews. Participants who revealed during the interview that their HIV diagnosis dated to before the age of 15 were omitted from analyses (n=6) as their status would necessarily predate any behavioral sources of risk and was possibly due to maternal transmission.

2.1 Ethics approval

Internal review boards at the University of Pretoria, Indiana University, the township Hospital and each of the four clinics and the City of Tshwane (Pretoria) approved the research. All participants gave signed informed consent. Minors under 18 (16) submitted signed parental consent and assent. A Masters' level mental health counselor was available to counsel participants if requested or referred by interviewers.

2.2 Measurement

2.2.1 HIV test results

HIV test results were recorded from medical charts provided by the patient herself or by medical personnel at the clinic. Most women had undergone recent HIV testing as part of routine care within the past 6 months, and for the few who lacked test results we asked them to obtain them at the free testing clinic in the hospital where results would be entered into

their charts. The director of the HIV treatment clinic and co-author (SH) documented the standard practice of HIV testing at the hospital and affiliated clinics: a rapid screening test issued by OraQuick Advance® (Orasure Technologies, Bethleham, PA, USA) or ABON™ HIV 1/2/0 Tri-line HIV test® (ABON Biopharm, Hangzhou, China) was used to detect antibodies to the HIV virus type 1 or 2. In the case of discordant results (e.g., first one positive, second one negative), a blood sample was sent out to a South African laboratory for an HIV enzyme-linked immunosorbent assay test, which detects both HIV antibodies and antigens, with these test results confirming the final status.

2.2.2 Sociodemographics

Participants supplied demographic information regarding their race, age, educational level last completed, and whether they were ever married (including divorced, separated, or widowed).

2.2.3 Intimate partner violence

Our measure derives from the multi-country World Health Organization questionnaire reflecting the WHO definition of IPV as inflicting physical, psychological or sexual harm.[18] We selected five items from the original questionnaire in which women were asked whether they "ever had a partner who treated you in the following ways" such as "pushed or slapped you or threw something at you," or "beat you up, kicked or dragged you," or "physically forced you to have sexual intercourse." Women were classified as exposed to IPV after "experiencing any single episode of abuse".[18]

2.2.4 Reproductive coercion

The American Congress of Obstetricians and Gynecologists (2013)[19] recognizes reproductive coercion as behavior "intended to maintain power and control in a relationship related to reproductive health…to include explicit attempts to impregnate a partner against her will, control outcomes of a pregnancy, coerce a partner to have unprotected sex, and interfere with contraceptive methods." The Reproductive Coercion Scale assesses "pregnancy coercion" and contraceptive "sabotage".[20] We administered three items from the pregnancy coercion subscale of the Reproductive Coercion Scale, including whether their partner had ever "Told you not to use birth control," "Told you he would have a baby with someone else if you didn't get pregnant," or "Made you have sex without a condom so you would become pregnant."

2.2.5 Long-acting reversible contraception

Women who used "intrauterine devices or the coil" at any time were classified as using LARC.

2.2.6 Sexually transmitted infections/herpes simplex virus type 2

The interview probed lifetime history of sexually transmitted infection with questions asking whether "a doctor or other healthcare professional ever told you that you had genital herpes?" and whether they had ever been "diagnosed for other sexually transmitted infections (like syphilis, chlamydia, gonorrhea)?"

2.2.7 Sexual power inequality

We administered four items from the "relationship control" subscale of the 23-item Sexual Power Relationship questionnaire.[21] The statements are rated on a four-point scale, and higher scores signify inequality or powerlessness, as in "If I asked my partner to use a condom, he would think I'm having sex with other people."

2.3 Statistical analyses

Analyses were performed with SAS 9.4 (SAS Institute Inc., Cary, NC, USA). Descriptive findings were based on bivariate frequencies or mean scores for the sample and by the outcomes of HIV or reproductive coercion. Multivariable logistic regression models resulted in odds ratios (OR) for HIV and reproductive coercion. Mediation analyses tested the degree to which reproductive coercion mediates between IPV and HIV.

3 RESULTS

All participants self-described as black with their average age 24 years (standard deviation [SD] 3.3 years), and 12.2% (n=107) were born outside South Africa. The average length of women's current relationship was 3.7 years (SD 2.7 years). Table **1** presents the frequencies or/and mean scores and unadjusted odds ratios of key variables predicting HIV. Seropositive respondents tended to be somewhat older, less likely to have completed secondary school and twice as likely to have been married than controls. More seropositive than seronegative outpatients experienced IPV, reproductive coercion, and sexually transmitted infection. There were no HIV group differences for sexual relationship power or having an abortion. About half of seropositive women 214 (50.2%) reported reproductive coercion in contrast to 175 of the seronegative women (38.5%) (adjusted OR 2.1, 95% confidence interval [CI] 1.58–2.76).

Table **2** presents the same predictors of HIV with reproductive coercion as the outcome. Of the 359 women experiencing reproductive coercion 194 (54%) endorsed one item; 95 (26.5%) endorsed two, and 70 (19.5%) endorsed all three questions. Each social behavioral variable distinguished women with and without reproductive coercion yielding unadjusted OR well above chance as shown for IPV (OR 3.86, 95% CI 2.89–5.15), sexually transmitted infection (OR 1.89, 95% CI 1.39–2.55), abortion (OR 2.46, 95% CI 1.41–4.26), and sexual relationship inequality (OR 1.78, 95% CI 1.44–2.2). Despite the strong link to IPV, as many

Table 1. Sociodemographic and risk variables associated with HIV diagnosis.

Variables	**n**	**Total sample (N=882)**	**Cases** **HIV+ positive** **n=427**	**Controls** **HIV− negative** **n=455**	***P***	**Unadjusted odds ratios**
Age in years mean, (SD)	—	*M*=24 (3.3)	*M*=25.8 (2.9)	*M*=22.8 (3.2)	0.000	1.319 (1.26, 1.39)
Matriculated completed 12th year (%)	490	55.6%	48%	60%	0.157	0.583 (0.45, 0.76)
Relationship status (%) ever married, divorced or widowed	131	14.9%	19.35%	10.55%	0.000	1.969 (1.34, 2.89)
Reproductive coercion (any)	360	40.8%	50.2%	31.8%	0.000	2.1 (1.58, 2.76)
Intimate partner violence (any)	451	51.2%	62.4%	40.7%	0.000	2.41 (1.84, 3.17)
STI_HSV-2	254	28.8%	33.8%	24.1%	0.001	1.6 (1.19, 2.16)
Long-acting reversible contraception or LARC	79	8.9%	10.7%	7.1%	0.000	1.57 (0.97, 2.53)

Variables	n	Total sample (N=882)	Cases HIV+ positive n=427	Controls HIV− negative n=455	*P*	Unadjusted odds ratios
Abortion (any)	58	6.6%	7.1%	6.2%	0.62 n.s.	1.15 (0.67, 1.95)
Sexual relationship power	—	M=2.2 (.07)	M=2.2 (.07)	M=2.2 (.07)	0.75 n.s.	1.03 (0.85, 1.26)

Abbreviations: CI, confidence interval; HSV, herpes simplex virus type 2; SD, standard deviation; STI, sexually transmitted infection.

Table 2. Bivariate associations of demographic and sexual behavioral risk variables to reproductive coercion.

Variable	Any reproductive coercion (n=358)	No reproductive coercion (n=519)	*P* value	OR (95% CI)
Age	24.6 (3.1)	23.6 (3.4)	0.000	1.11 (1.06–1.15)
Matriculated (completed 12th year)	52.2%	57.8%	0.10	0.80 (0.61–1.05)
Relationship status (married, divorced, or widowed)	14.5%	15.2%	0.77	0.95 (0.65–1.38)
Intimate partner violence (any)	70.3%	38%	<0.000	3.86 (2.89–5.15)
STI/HSV2	36.4%	23.2%	0.000	1.89 (1.39–2.55)
Long-acting reversible contraception	11.4%	7.2%	0.03	1.67 (1.04–2.68)
Abortion (any)	9.9%	4.3%	<0.000	2.46 (1.41–4.26)
Sexual relationship power (high score=inequality), mean (SD)	2.4 (.7)	2.1 (.6)	0.000	1.78 (1.44–2.20)

Abbreviations: CI, confidence interval; HSV, herpes simplex virus type 2; OR, odds ratio; SD, standard deviation; STI, sexually transmitted infection.

as 127 (29.7%) of women describing reproductive coercion were not dual victims of IPV. More women experiencing reproductive coercion used LARC (43, 10.1%) versus controls (32, 7.1%). reflected in logistic regression analysis (OR 1.67, 95% CI 1.04–2.68). The association of social behavioral variables with the measure of reproductive coercion underscores the construct validity of this brief adapted scale.

To determine whether reproductive coercion raises the odds of HIV we tested four cumulative adjusted models as displayed in Table **3**. Demographic covariates were entered exclusively in the first model with reproductive coercion as the signal predictor for HIV status (adjusted OR 1.74, 95% CI 1.29–2.36); model 2 adds sexually transmitted infection to demographics with a resulting adjusted OR for reproductive coercion of 1.67 (95% CI 1.23–2.27); model 3 includes all previously tested predictors with LARC (adjusted OR 1.71, 95% CI 1.25–2.34); and model 4 adds IPV as a predictor to the final full model showing that reproductive coercion generates a 42% increase in odds of HIV when all covariates are entered (adjusted OR 1.42, 95% CI 1.02–1.98). We tested a mediational model between IPV, reproductive coercion and HIV within SAS MACRO (Table **4**). The proportion mediated was 0.183 and the model was significant (P<0.0001). Reproductive coercion, therefore, acts as a partial or incomplete mediator between IPV and HIV yet exerts independent influence on HIV outcomes.

Table 3. Adjusted logistic regression models showing reproductive coercion predicting HIV.

Model 1[a]	**aOR (95% CI)**	**Model 2**[b]	**aOR (95% CI)**	**Model 3**[c]	**aOR (95% CI)**	**Model 4**[d]	**aOR (95% CI)**
	1.75 (1.29–2.36)	Reprod. coercion	1.67 (1.23–2.27)	Reprod. coercion	1.71 (1.25–2.34)	Reprod. coercion	1.42 (1.02–1.98)
Nagerkele r^2	0.2359		0.2578		0.2578		0.2767

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; IPV, intimate partner violence; LARC, long-actiing reversible contraception; STI, sexually transmitted infection.

[a] Model 1 adjusted for age, matriculation, ever married.

[b] Model 2 adjusted for age, matriculation, ever married, STI.

[c] Model 3 adjusted for age, matriculation, ever married, STI, LARC.

[d] Model 4 adjusted for age, matriculation, ever married, STI, LARC, IPV.

Table 4. Reproductive coercion partially mediates intimate partner violence in predicting intimate partner violence.

Effect	Estimate	*P* value	95% CI
Natural direct effect	1.97	0.000	1.44–2.69
Natural indirect effect	1.11	0.042	1.00–1.22
Total	2.19	<0.000	1.62–2.96

Note:

Proportion mediated 0.183.

4 DISCUSSION

Our study highlights the role of reproductive coercion in women's risk for HIV infection in South Africa where the number of people living with HIV is the highest in the world at 7.7 million.[17] Results confirm that women who disclose reproductive coercion are at elevated risk for abortion and sexually transmitted infections, including herpes simplex virus type 2, which is consistent with studies of IPV and reproductive coercion in other countries.[7] Feelings of sexual power inequality are also associated with reproductive coercion, illustrating the broad canvas of control in these relationships.[5, 21] In our study, women with a partner who pressured her to become pregnant were 37% more likely to use LARC, consistent with a 2009 survey of more than 20 000 women across six African countries in which women with abusive partners were more likely than non-abused women to use any form of contraception including long-acting.[22]

Although the association between reproductive coercion and HIV is attenuated when other covariates, and especially IPV, are added to the regression model, it nevertheless retains its influence on HIV risk. This finding demonstrates that reproductive coercion generates an independent path to infection beyond even IPV and, in fact, almost one in three women experiencing reproductive coercion were not victims of violence. To further explore the triangulated relationships between IPV, reproductive coercion, and HIV we examined whether reproductive coercion bridges the effect of IPV to HIV through mediation. IPV

retains most of the explanatory variance for HIV, whereas reproductive coercion captures some proportion of its effect as a partial mediator.

Reproductive coercion is a marker for a broad array of men's abusive behaviors and is clinically observed in women who do not disclose violent victimization in other forms. The putative effects of reproductive coercion are devastating. Forcing a pregnancy on a woman derails her life, threatens her health, deprives her from timing her birth, thereby compromising that infant's future. Given that the problem is not rare in outpatient populations, that it undermines women's and infants' health, and is preventable suggests that investing in training for staff and education for patients is warranted. Assessing IPV is equally important, although not all cases of reproductive coercion will be detected in IPV surveys because some of the women have not experienced IPV. Yet even the brief reproductive coercion subscale used here captured nearly half (40%) of the outpatients attending antenatal, obstetrics, gynecology and other medical clinics, suggesting that the scale can be adapted.

Policy makers and practitioners have focused attention on how to prevent reproductive coercion or shield women from the consequences. The Family Violence Prevention Fund sponsored a guide on remedies for reproductive coercion*, Futures without Violence*.[23] The authors provide a useful toolkit for training medical and counseling staff about IPV and reproductive coercion, covering a range of topics such as assessment, language barriers, harm reduction in counseling patients, the limits of confidentiality, and follow-up or referral.

Health care is a critical venue for addressing reproductive coercion. The American Congress of Obstetricians and Gynecologists recommends that reproductive coercion be addressed in clinical encounters with patients in North America.[19] In addition to helping patients recognize reproductive coercion as an abuse tactic, healthcare providers may prescribe LARC in the form of intrauterine devices, implants and even progesterone injectables. All are covert forms of contraception that can help women evade attempts at pregnancy control. LARC is the most effective form of birth control outside sterilization, although fewer than 10% of South African women use such methods, in part because they are unavailable in the clinics and staff often lack training.[24] On the other hand, nearly half (41.8%) used injectables which would be worth promoting because of the ease of delivery in clinics[24] Our results show that almost twice as many women experiencing reproductive coercion use long-lasting methods compared with control women, indicating that they have discovered the merits of LARC as a line of defense against forced, unsupported pregnancies. LARC offers a feasible alternative to voluntary sterilization, which is also more common for women in abusive relationships.[25] Further research on gender inequities, reproductive coercion, and HIV risk in cultural context can inform fresh approaches to prevention to end the practice of coerced

pregnancy and to stem the tide of HIV in Africa, which thwarts the health of women in their prime.

AUTHOR CONTRIBUTIONS

LM, IE, SH, and KM contributed to the study design; LM, SH, and KM contributed to data collection and measurement; LM, SH, and IE contributed to gaining ethics approval; LM, IE, and SH contributed to writing and editing the manuscript; LM and PD planned the data analyses; PD performed the data analysis and edited the manuscript; and LM drafted the tables. All authors (LM, IE, SH, KM, PD) lent final approval of the manuscript.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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