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Intimate partner violence and engagement in the HIV care continuum among women in sub-Saharan Africa: a prospective cohort study

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Ethics approval: The authors certify that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. The study was approved by the following institutional review board or ethics committee at each study site and corresponding collaborating institutions in the US, if required:

Name and Location of Implementing Site	Ethics Committees/IRBs that provided approval
Medical Research Council Sites (Durban, South Africa): • Chatsworth • Botha's Hill • Isipingo • Overport • Tongaat • Verulam • Umkomaas	UKN BREC: University of KwaZulu-Natal Biomedical Research Ethics Committee
CAPRISA Sites: • eThekwini (Durban, South Africa) • Aurum (Klerksdorp, South Africa)	UKN BREC: University of KwaZulu-Natal Biomedical Research Ethics Committee
UZ-UCSF HIV Prevention Trials Unit Sites (Harare, Zimbabwe): • Seke South • Spilhaus • Zengeza	MRCZ: Medical Research Council of Zimbabwe RCZ: Research Council of Zimbabwe UCSF-CHR: University of California, San Francisco- Human Research Protection Program & IRB (formerly CHR) UZ JREC: University of Zimbabwe Joint Research Ethics Committee
• Wits RHI CRS (Johannesburg, South Africa) • Perinatal HIV Research Unit (Soweto, South Africa)	Wits HREC: Wits University Human Research Ethics Committee
• MU-JHU Research Collaboration (Kampala, Uganda)	Johns Hopkins University IRB NARC: National HIV/AIDS Research Committee UNCST: Uganda National Council for Science and Technology

Consent: Informed consent was obtained from all individual participants included in the study.

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Abstract

Research suggests that women's experience of intimate partner violence (IPV) is associated with poor engagement in HIV care and treatment. However, most studies have been cross-sectional and conducted in North America. We examined the association between physical IPV and HIV care outcomes in a prospective cohort study of women living with HIV (WLHIV) in Malawi, South Africa, Uganda, and Zimbabwe. At enrollment, 15% of the 351 participants self-reported physical IPV. IPV experience was not associated with time to first engagement in HIV care or the proportion virally suppressed after 6 months on ART. Women reporting physical IPV were less likely to initiate ART within 6 months of becoming eligible (adjusted RR 0.74, 95% CI 0.53–1.03). IPV screening is critical to identify survivors and link them to appropriate services. However, addressing IPV may not increase engagement in HIV care or viral load suppression among WLHIV in sub-Saharan Africa.

Keywords

Intimate partner violence; women living with HIV; sub-Saharan Africa; HIV care continuum; ART initiation; viral suppression

Introduction

Intimate partner violence (IPV) is a highly prevalent public health problem that violates women's rights and affects their physical and mental health. In the World Health Organization (WHO) Africa region, 20% of women report physical or sexual violence in the past year (1), and women living with HIV (WLHIV) experience higher rates of IPV than HIV-negative women (2). Among WLHIV, IPV is associated with poor engagement in care and treatment, including delayed antiretroviral therapy (ART) initiation, lower self-reported ART adherence, and lower rates of viral suppression (3). IPV-related challenges to clinic visits and consistent ART use include women's desire to hide their HIV status from their partners to avoid further violence, direct partner interference, and violence-induced depression, stress, physical illness, and injury (3). However, the majority of studies on the association between IPV and HIV care outcomes have been cross-sectional and conducted in North America. The impact of IPV on these outcomes in sub-Saharan Africa, where the burden of HIV is highest, is not well-described. The few longitudinal studies in the region have been conducted among WLHIV who are pregnant, post-partum, or engaged in sex work, rather than the general population of WLHIV, and most have not found an effect of IPV on HIV care outcomes (4–7). More longitudinal studies are needed to establish whether IPV is a risk factor for poor engagement in the HIV care continuum among women in sub-Saharan Africa, to improve support services for IPV survivors and health outcomes among WLHIV.

We examined the association between physical IPV and HIV care and treatment outcomes in Microbicide Trials Network (MTN)-015, a prospective cohort study of women who acquired HIV while participating in clinical trials of biomedical HIV prevention methods in East and Southern Africa (ClinicalTrials.gov number NCT00514098). We hypothesized that women who reported physical IPV at enrollment would be less likely to engage in HIV care, to initiate ART, and to be virally suppressed during follow-up, compared to women who did not report physical IPV.

Methods

Study population and parent trials.

MTN-015 enrolled women who acquired HIV-1 during participation in MTN clinical trials (8). This analysis included participants from two parent trials, MTN-003/VOICE and MTN-020/ASPIRE, conducted in Malawi, South Africa, Uganda, and Zimbabwe (9,10). In both trials, eligible women were 18–45 years old, healthy, HIV-1-uninfected, not pregnant, sexually active, and willing to use highly effective contraception. All participants with confirmed HIV seroconversion were offered enrollment into MTN-015 unless the site investigator believed participation would be unsafe or interfere with achieving the study objectives. The protocol was approved by an institutional review board at each study site, and by collaborating institutions in the United States when required. Written informed consent was obtained from each participant.

MTN-003/VOICE was a randomized placebo-controlled trial assessing the safety and effectiveness of daily treatment with vaginal tenofovir gel, oral tenofovir disoproxil

fumarate (TDF), and oral TDF-emtricitabine (FTC) for the prevention of HIV-1 infection in women (ClinicalTrials.gov number NCT00705679) (9). The study was conducted from 2009 through 2012 and enrolled 5029 women from 15 sites in South Africa, Uganda and Zimbabwe. In intent to treat analyses, HIV incidence in the intervention arms did not differ from that in the respective placebo arms.

MTN-020/ASPIRE was a randomized placebo-controlled trial assessing the safety and effectiveness of a monthly dapivirine vaginal ring for the prevention of HIV-1 infection in women (ClinicalTrials.gov number NCT01617096) (10). The study was conducted from 2012 through 2015 and enrolled 2629 women at 15 sites in Malawi, South Africa, Uganda and Zimbabwe. The study demonstrated 27% efficacy overall and greater than 50% efficacy among women aged >21 years, who had higher adherence levels.

Study procedures.

Detailed procedures have been described previously (8). Eligible participants were enrolled into MTN-015 at any time after confirmation of HIV seroconversion in the parent trial. Study visits occurred at enrollment, at 1, 3 and 6 months after first detection of HIV seroconversion, and then every 6 months thereafter with a minimum follow-up duration of 12 months. Participants who initiated ART for treatment or for prevention of maternal to child transmission (PMTCT) switched to a revised schedule with study visits 2 weeks, 1, 3, and 6 months and then every 6 months following initiation. At each visit, procedures included medical history, counselling, physical examination, and laboratory testing for CD4+ T cell count and HIV-1 RNA, plus urine pregnancy testing if clinically indicated. Clinical care included testing and treatment of sexually transmitted infections and provision of contraceptives. Participants were referred for HIV care and PMTCT either within the study site or at local clinics that had an established referral relationship with the site.

Behavioral assessments were completed at enrollment, at months 3, 12, and 24 following seroconversion, and (for those who initiated ART) at months 3, 12, and 24 following ART initiation. The behavioral assessments were conducted by face-to-face interview initially but were changed to audio-computer-assisted self-interviews (ACASI) with an abbreviated face-to-face interview beginning in May 2013.

Measures.

The exposure, physical IPV, was assessed at enrollment only by self-report of whether the participant's husband or regular partner had "*ever slapped, hit, kicked, thrown things at you, or otherwise physically hurt you*" in the last 12 months. Engagement in care was defined as self-report of having seen a provider for HIV care or treatment since diagnosis or since the last interview. We also considered self-report of ART initiation in between behavioral assessments as evidence of engagement in care. Timely ART initiation was defined as self-report of ART initiation within 6 months of becoming eligible, where eligibility was defined by pregnancy, diagnosis of an AIDS-defining event according to WHO criteria, or CD4 count below the threshold determined by local and/or WHO guidelines in place at the time of the study visit. Viral suppression was defined as HIV RNA <200 copies/ml or below the lower limit of detection among those who had initiated ART at least 6 months ago.

Analysis.

All analyses were restricted to those who had not experienced each outcome at enrollment. We used Cox proportional hazards models to compare time from seroconversion to first engagement in care, censoring participants at their last follow-up visit. Risk ratios for timely ART initiation were estimated with Poisson regression models. Risk ratios for viral suppression were estimated using Poisson regression models with generalized estimating equations (GEE) to account for multiple observations per participant. All analyses were run with robust standard errors as bivariate (unadjusted) models and then as multivariable models adjusting *a priori* for country and parent trial. Several additional baseline variables, selected based on literature review and causal diagrams, were assessed as potential confounders and retained in the model if they resulted in meaningful changes (>10%) to the estimated risk ratios. These included sociodemographic characteristics, relationship factors, sexual behaviors, and time since seroconversion, MTN-015 enrollment, or ART initiation.

Results

Of 531 women who seroconverted during MTN-003 and MTN-020, 379 (71.3%) enrolled into MTN-015, and 351 (92.6%) had data on physical IPV and were included in this analysis. Median age was 24 years (interquartile range [IQR] 21–28) and median time from seroconversion to MTN-015 enrollment was 69 days (IQR 37–135). The majority of participants were from the MTN-003 trial (72%), from South Africa (86.3%), had at least some secondary education (91.2%), and earned their own income (57.4%). Nearly all women (94%) reported a male sex partner: the majority received financial or material support from their partner but were not married or cohabiting.

Fifty-two women (14.8%) reported physical IPV in the past 12 months at enrollment. Among 232 participants who had not engaged in HIV care at enrollment, 128 (55.17%) engaged in care at some point during follow-up. Median time to engagement in care was 1.6 years, and did not differ by exposure to physical IPV in either bivariate analysis or multivariate analysis (adjusted hazard ratio 0.91, 95% CI 0.54–1.53, p=0.71; Table 1). Among the 175 women who became eligible for ART during follow-up, 105 (60.0%) initiated ART within 6 months. Women who reported physical IPV were less likely to initiate ART within 6 months than women who did not report physical IPV, though the result did not reach statistical significance (adjusted risk ratio [aRR] 0.74, 95% CI 0.53–1.03, p=0.08). There were 360 participant visits that occurred ≥6 months after ART initiation, among 129 participants. Of these, HIV RNA levels indicated viral suppression at 97 visits (65.10%). There was no difference in the proportion of visits with viral suppression in women who reported physical IPV vs. those who did not (aRR 0.98, 95% 0.86–1.11, p=0.73).

Discussion

In this prospective cohort study of newly diagnosed WLHIV in Malawi, South Africa, Uganda, and Zimbabwe, about 1 in 7 women reported experiencing physical IPV in the past year, and this experience was not significantly associated with engagement in HIV care or viral suppression, though a trend for delayed ART initiation was observed.

Our findings do not support conclusions from a recent scoping review that IPV impedes women's uptake of, and adherence to, HIV care and treatment (3). The majority of the studies included in this review used a cross-sectional design with self-reported outcomes. However, among cross-sectional or longitudinal sub-Saharan African studies that used objective measures of adherence (e.g. pharmacy records, pill counts) or biomarker measures of viral suppression, IPV was not associated with reduced viral suppression in four of five studies (4,5,7,11,12), and was not associated with on-time ART refills (4) or ART adherence (5). Three longitudinal studies in the region also did not find associations with self-reported measures of engagement in care (5,6) or adherence (4,6). Only one longitudinal study measured receipt of ART as a potential marker of ART initiation; similar to our study, the authors found that women reporting physical IPV were less likely to have received ART at 6 months after enrollment, although ART eligibility was not reported (6). While these studies suggest that IPV is not a strong predictor of HIV care and treatment outcomes, they are few in number and were all conducted among specific populations of pregnant or post-partum women, women engaged in sex work, or young women with perinatally-acquired HIV. These populations experience higher rates of IPV and often receive HIV-related services at dedicated facilities. In contrast, our study was conducted among trial participants belonging to the general population of WLHIV, who may experience different general and IPV-related motivations, barriers, and facilitators to HIV care and treatment.

Other studies have suggested that emotional IPV is more strongly associated with ART adherence than physical IPV and that the risk of poor outcomes increases with increasing frequency of physical IPV (13,14). Our IPV measure was restricted to a baseline assessment of physical violence only, and we did not collect data on the frequency or severity of reported violence. A more detailed and repeated measure may improve our understanding of how IPV impacts engagement in HIV care by identifying women who have experienced emotional, sexual, or economic IPV, more frequent or severe violence, or ongoing IPV after study enrollment. There are two additional limitations to this study. First, our IPV, engagement in care, and ART initiation outcomes were self-reported and may have been subject to social desirability bias. However, our IPV prevalence estimate is similar to representative estimates of physical IPV in the study countries and participants were asked to provide documentation of ART initiation, which should have minimized overreporting. Second, the study was conducted among clinical trial participants who received high quality counseling and viral load results at every study visit, which may have mitigated the effect of IPV and limited the generalizability of our findings. Experience of IPV may have a greater impact on engagement in HIV care in a community-based sample of WLHIV receiving less intensive support.

Intimate partner violence is endemic in sub-Saharan Africa and is associated with health effects including mental illness, poor birth outcomes, STI incidence, injury, and mortality. Screening for IPV at HIV clinics may provide opportunities to identify survivors and link them to programs to prevent further violence and mitigate its consequences. However, our findings do not suggest that IPV is a substantial barrier to engagement in HIV care or viral load suppression. Additional studies are needed among the general population of WLHIV outside of clinical trial settings, using longitudinal designs, detailed IPV assessment, and objective outcome measures to understand how IPV impacts women's engagement in the

HIV care continuum, and whether targeted interventions could improve HIV-related health outcomes among IPV survivors.

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Data, materials, and code availability:

Study data and analysis are available upon request from the Microbicide Trials Network by submission of a Dataset Request Form available at http://www.mtnstopshiv.org/resources. The reason for the restriction on public data deposition is because of ethical and legal restrictions. Study materials such as the protocol and data collection tools are publicly available at http://www.mtnstopshiv.org.

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Table 1:

Engagement in the HIV care continuum during MTN 015 follow-up

	Total	Physical IPV	No physical IPV	Unadjusted model		Adjusted model	
	n/N (%)	n/N (%)	n/N (%)	RR (95% CI)	p	aRR (95% CI)	p
Engaged in care[a]	128/232 (55.17)	17/29 (58.62)	111/203 (54.68)	1.03 (0.63–1.68)	0.90	0.91 (0.54–1.53)	0.71
Timely ART initiation[b]	105/175 (60.00)	14/26 (53.85)	91/149 (61.07)	0.88 (0.61–1.27)	0.50	0.74 (0.53–1.03)	0.08
Visits with viral suppression[c]	266/360 (73.89)	45/57 (78.95)	221/303 (72.94)	1.08 (0.98–1.19)	0.13	0.98 (0.86–1.11)	0.73

[a]Hazard ratio for time to first reported engagement in HIV care after study enrollment. Adjusted model (n=229) controls for study, education, marital status, and relationship length.

[b]Risk ratio for proportion of women reporting ART initiation within 6 months of meeting country- and time- specific eligibility criteria. Adjusted model (n=160) controls for study, age, income, cohabiting, transactional sex, and partner HIV status.

[c]Risk ratio for proportion of visits with viral load undetectable or <200 copies/ml among women who initiated ART >=6 months ago. Adjusted model (N=354 visits from 125 women) controls for study, marital status, and transactional sex.