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HIV Risk Among Pregnant Teenagers With a History of Interpersonal Violence

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Abstract

This study examined the relationship between interpersonal violence, depressive symptoms, and HIV risk behaviors among pregnant teenagers. A sample of 116 pregnant teenagers was recruited in Rhode Island. Multivariate logistic regressions tested whether the relationship between history of interpersonal violence and HIV risk remained after controlling for age and education. Participants reported a young age of sexual debut and low rates of condom use. Multivariate logistic regressions indicate a significant relationship between interpersonal violence and HIV risk but not in degree of depression symptoms and HIV risk. Pregnant teenagers with a history of interpersonal violence may benefit from interventions that address HIV risk.

Keywords

HIV; sexually transmitted infections; pregnancy; teenagers; interpersonal violence; depression

In the United States, youth 13 to 24 years of age represent 13% of newly diagnosed HIV cases in 2009 (CDC, 2008) and nearly half of all sexually transmitted infections (STIs) (Weinstock, Berman, & Cates, 2004). Pregnant teenagers are especially vulnerable to HIV (Meade & Ickovics, 2005). Studies have shown that pregnant teenagers are more likely to be

infected with HIV prior, during, and after pregnancy due to high rates of risky sexual behavior and existing STIs which can increase the biological potential for HIV infection (Campbell et al., 2008; Ickovics, Niccolai, Lewis, Kershaw, & Ethier, 2003).

A subset of pregnant teenagers – those with a history of interpersonal violence – may be at even higher risk for HIV. Although there are limited studies of the relationship between interpersonal violence and HIV risk among pregnant women (Russell, Eaton, & Petersen-Williams, 2013) these studies, combined with studies among women more generally, demonstrate that victims of interpersonal violence are at elevated risk for HIV due to biological factors (e.g., comprised immune systems or trauma to the vaginal wall), behavioral factors (e.g., limited or compromised safe sex negotiation, substance use, sex with older partners)(Campbell et al., 2008). Victims of interpersonal violence are also likely to experience poor psychological sequelae (Briere & Elliott, 2003), of which depression is particularly common (Devries et al., 2013).

We are beginning to understanding whether and how depression and interpersonal violence contribute to HIV risk. For examples, studies have demonstrated a syndemic of depression and violence among men who have sex with men (Stall et al., 2003) and minority women (Gonzalez-Guarda, McCabe, Florom-Smith, Cianelli, & Peragallo, 2011). One of the possible linkages between interpersonal violence, depression, and HIV risk is psychological dysregulation. Difficulty managing the dysregulation of emotions can result in cognitions and behaviors that increase HIV risk (Cavanaugh, Hansen, & Sullivan, 2010) including sexual impulsivity and substance use (Chaney & Chang, 2005) (Seedat, Stein, & Forde 2003), decreased ability to assess risk (Ehlers & Clark, 2000) (Messman-Moore & Long, 2003), decreased ability to negotiate or implement protective behaviors, and engagement in multiple short-term sexual partnerships (Plotzker, Metzger, & Holmes, 2007). Virtually no studies to date have examined HIV risk, depression, and interpersonal violence among pregnant teenagers using mixed racial and ethnic samples. Additional exploration of whether or not depression and/or interpersonal violence are related to HIV risk among pregnant teenagers would provide insight into the needs of this vulnerable youth population.

We conducted our study in Rhode Island, where rates of pregnancy, sexual risk behavior, and interpersonal violence are high. Among the New England States, Rhode Island has the highest rates of teenage pregnancy, at 28.5 per 1,000 births (Mathews, Sutton, Hamilton, & Ventura, 2010). Significant numbers of teenagers report dating violence (8%) and forced sexual intercourse (7%). Nearly half of teenagers (44%) reported being sexually active and 39% had unprotected sex at last intercourse (Cryan, 2010). In 2010, rates of chlamydia (2,500 new cases) and syphilis (154 new cases) increased, with infections highest among teenagers (Rhode Island Department of Health, 2011). Depression is another important consideration among Rhode Island teenage girls; female teenagers are twice as likely to experience major depression compared to male teenagers (The Substance Use and Mental Health Services Administration, 2012). Because the prevalence of pregnancy, interpersonal violence, and sexual risk behavior is particularly high, Rhode Island provides a unique setting to examine the intersection between interpersonal violence, depression, and HIV risk behaviors among pregnant teenagers.

This paper reports on intake data from a larger study testing the efficacy of a psychosocial intervention to prevent postpartum depression in pregnant teenagers in Rhode Island (Phipps, Raker, Ware, & Zlotnick 2013). The primary aim of this paper was to examine the relationship between HIV risk behaviors and history of interpersonal violence and level of depressive symptoms in a diverse ethnic and racial sample of pregnant teenagers. Understanding this relationship can inform our understanding of multiple risks for HIV as well as the design of interventions to address HIV risk among a potentially vulnerable population.

Method

Participants

Participants were recruited from the Women's Primary Care Center, an urban prenatal clinic that cares for women of all ages and diverse backgrounds at Women and Infants Hospital (WIH) between February 2007 and August 2008. Participants were informed about the study from a research assistant and asked questions (via our screener form) to determine eligibility. Eligibility criteria included: 17 years or younger when pregnancy was conceived and less than 25 weeks gestational age at the first prenatal visit. If the subject was eligible, she was asked to participate and if willing and interested, parental or guardian consent was obtained in person or by phone and then the participant also provided informed assent. After consent/assent completion, the subject received a copy of the signed assent form, completed a registration form to capture contact information, and was scheduled for an intake/randomization visit. A total of 116 participants were administered the intake survey. Of these, 111 participants were screened for the Children's Depression Rating Scale - Revised (CDRS-R), comprising data for or analysis; five presented with evidence of depression or treatment for depression and thus screening with the CDRS-R was unwarranted (Poznanski et al., 1984). These five participants with existing depression were also excluded in this study for ethical reasons, since there are existing treatments for teenagers with depression. The study protocol was approved by the Institutional Review Board of WIH (# 06-0031).

Materials and Procedures

All study surveys and assessments were administered by a trained research assistant under the supervision of MP, principal investigator of the study. The status of the subjects in terms of condition assignment was unknown to the research assistant in an attempt to reduce a potential bias. A book and increasing financial incentives were offered for ongoing participation. Subjects could earn up to \$80.00 (\$10.00 at the 20–24 week interview, \$10.00 at the 34–36 weeks interview, \$20.00 at the 6 week postpartum interview, \$20.00 at the 3 month postpartum interview, and \$20.00 at the 6 month postpartum interview). As part of standard study procedures, all participants were referred to the adolescent social worker during their prenatal visit as part of their routine care. If the assessment interview, answers to questionnaires, or intervention sessions raised concerns about depression, abuse, or safety issues, the participant was referred to social services for appropriate evaluation and follow-up and the PI was informed. This practice was clearly explained to the participant as part of the informed consent process.

The questionnaire gathered information on sociodemographic characteristics. HIV risk behaviors included self-report of the following risk behaviors: a yes/no response to condom use in the month prior to pregnancy, age of first sexual experience, and age of first vaginal intercourse. The questionnaire also gathered information on depression symptoms using the CDRS-R. This 17-item scale has items ranging from 1 to 5 or 1 to 7, with a total possible score from 17 to 113. A score of 40 is indicative of depression. The CDRS-R had a reliability of $\alpha=0.63$ (95% CI: 0.43 to 0.76), somewhat lower than the recommended value of $\alpha=0.70$. However, certain CDRS-R items exhibiting lower internal consistency may have been impacted by pregnancy: hypoactivity, appetite disturbance, excessive fatigue, and physical complaints. Removal of these items resulted in a raw score that was highly correlated with the full scale standardized CDRS-R ($r=0.85$). To be consistent with other reports using CDRS-R, we elected to use the full CDRS-R as a measure of depressive symptoms. History of interpersonal violence was assessed using the following questions drawn from the Abuse Assessment Screen (McGrath, Hogan, & Peipert, 1998; Norton, Peipert, Zierler, Lima, & Hume, 1995): “Has a family or household member physically abused you during your lifetime?” “Has someone else physically abused you during your lifetime?” and “Has someone forced you to have a sexual experience in your lifetime?” We chose to aggregate the interpersonal violence measures into a yes/no response because the literature strongly demonstrates that any form of interpersonal violence is related to STI risk (Becker, 1974) and because correlations among these three measures were moderate, ranging from $r=0.37$ for physical abuse by family/household member and sexual abuse to $r=0.54$ between both physical abuse measures.

Data was analyzed using SAS version 9.2. Chi-square, *t*-tests, and linear regressions assessed the relationship between HIV risk, history of interpersonal violence, and depression symptoms. Multivariate logistic regressions tested whether the relationship between condom use in the month prior to pregnancy and history of interpersonal violence persisted after adjusting for age, education, depressive symptoms, and pregnancy intention. We did not control for ethnic or racial differences as there were no differences among these groups for condom use and history of interpersonal violence.

Results

Participants were a median age of 16 years (Range 13 to 18 years). Half were Latina (55.9%) followed by African American (18.0%), Caucasian (15.3%), Multiracial (7.2%), Asian (1.8%), American Indian/Alaskan Native (2%), or unidentified (7.2%). The majority were enrolled in school (76.7%). The majority did not intend to become pregnant (89.7%). Nearly half (41.4%) reported a history of physical and/or sexual abuse with 36% reporting physical abuse and 11.7% reporting sexual abuse. Participants reported an average depression symptom score of 53.5 ($SD = 6.5$, Range 40 to 75), corresponding to a clinically significant level of depression.

HIV risk behaviors were high and these risk behaviors did not vary by ethnicity or race. In the month prior to pregnancy, only 33.6% reported using condoms (Latina 33.9%, African-American 38.9%, Other race/ethnicity 28.6%; $p = 0.8$). Participants were an average of 14.2 years ($SD = 1.5$, Range 9 to 17 years) for their first sexual experience, defined as anything

more than kissing. Similarly, participants were an average of 14.5 years ($SD = 1.3$, Range 11 to 17 years) when they first had vaginal sex. Nearly a fifth of the sample reported never using a condom when they had sex (Overall 18.1%; Latina 20.0%, African-American 16.7%, Other race/ethnicity 14.3%; $p = 0.9$). For condom use in the month prior to pregnancy, there were no significant variations by race, ethnic category, age, or level of education.

Participants with a history of interpersonal violence were significantly more likely to have sex without a condom in the month prior to pregnancy (82.6%) than participants with no history of interpersonal violence (56.3%; $OR = 3.69$, $X^2 = 8.45$, $p < 0.003$). Lack of condom use was more pronounced among participants who responded affirmatively to two or three of the interpersonal violence measures (100%) compared to participants who responded affirmatively to just one measure (75%; p -trend < 0.001), suggesting a dose effect. Participants with a history of interpersonal violence were significantly younger at age of sexual debut (mean difference = -1.19 years, $SD = 1.35$, $T = 4.59$, $p < 0.0001$), and significantly younger at age of first vaginal intercourse (mean difference = -0.68 years, $SD = 1.28$, $T = 2.73$, $p < 0.007$) compared to those without history of interpersonal violence. Depression symptom scores were inversely correlated with age of first sexual experience ($r = -0.24$, $p < 0.01$). However, depressive symptoms and other measures of HIV and STI risk were not significantly correlated. Participants with a history of interpersonal violence were also significantly more likely to report higher depressive symptom scores compared to those without a history of interpersonal violence (mean difference = 3.73 , $SD = 6.24$, $T = 3.10$, $p < 0.003$).

Multivariate logistic regression analyses focused on condom use. Participants with a history of interpersonal violence were significantly less likely to use condoms in the month prior to pregnancy than participants without a history of interpersonal violence (*Model 1*: $OR = 0.23$, 95% $CI = 0.08$ – 0.63 , $p < 0.004$), even after adjusting for differences in chronological age ($OR = 0.95$, 95% $CI = 0.61$ – 1.47 , $p < 0.8$), age at sexual debut ($OR = 0.90$, 95% $CI = 0.63$ – 1.30 , $p < 0.6$) and education ($OR = 1.60$, 95% $CI = 0.51$ – 4.96 , $p < 0.4$). Because participants with a history of interpersonal violence were more likely to report higher depression symptoms and an intended pregnancy in bivariate analyses, we also included these variables in analyses. Participants with a history of interpersonal violence were still significantly less likely to use condoms in the month prior to pregnancy than participants without a history of interpersonal violence (*Model 2*: ($OR = 0.22$, 95% $CI = 0.08$ – 0.66 , $p < 0.006$) even after adjusting for depressive symptoms ($OR = 0.97$, 95% $CI = 0.91$ – 1.05 , $p < 0.5$), chronological age ($OR = 0.99$, 95% $CI = 0.63$ – 1.54 , $p < 0.9$), age at sexual debut ($OR = 0.87$, 95% $CI = 0.60$ – 1.28 , $p < 0.5$), education ($OR = 1.65$, 95% $CI = 0.52$ – 5.18 , $p < 0.4$), and pregnancy intention ($OR = 1.56$, 95% $CI = 0.33$ – 7.43 , $p < 0.6$). The odds ratios estimates from both models were similar, suggesting minimal confounding by depressive symptoms or pregnancy intention. The slight changes in p -values were likely due to decreased precision from additional model covariates.

Discussion

This study indicated a concerning level of HIV risk behaviors among this sample of pregnant teenagers. Our findings indicated low levels of condom use, young age of sexual debut, and young age of first vaginal intercourse in this mixed racial and ethnic sample. Low levels of condom use might be explained by a desire for pregnancy among some of the teenagers, but does not fully explain low levels of condom use given that the majority of our sample reported unintentional pregnancy. Our study also examined whether depression or history of interpersonal violence was related to low levels of condom use. It was surprising that severity of depression symptoms was not a significant factor for HIV risk behaviors. However, the non-significant association between depression and HIV risk behaviors may be due to the small sample size and needs to be further investigated. In contrast to depression, history of interpersonal violence was a significant risk factor for HIV risk behaviors. Furthermore, while we only found a trend towards significance, findings indicate a dose effect, with lack of condom use more common among participants who responded affirmatively to two or three of the interpersonal violence measures. This finding should be interpreted as exploratory given the sample size. There was no variability in HIV risk by race/ethnicity, suggesting that history of interpersonal violence increases risk for HIV regardless of race/ethnicity.

We recognize several limitations of our study. The cross-sectional nature of the study limited our ability to assess causal pathways between interpersonal violence, depression, and HIV risk. We also recognize that the CDRS-R lower than optimal reliability. Moreover, we did not explore the relational aspects of HIV risk among this population by gathering data from our study population's sexual partners. The perspectives of male partners would provide insight into dynamics of sexual risk among these pregnant teenagers. These limitations also highlight some potential directions for future research.

Future studies can explore the role of major depressive disorder, and factors associated with depression such as emotional dysregulation which may increase risk for HIV among pregnant teenagers. This includes, for example, longitudinal studies that would allow one to determine how changes in depression symptoms might affect HIV risk behaviors. Longitudinal studies that incorporate neuroimaging would also enable one to better understand sexual risk taking from a developmental perspective. Imaging studies could explore how changes in affective and motivational regulation affect risk behaviors affected to HIV including impulsivity and risk taking behaviors (McGrath et al., 1998; Organisation, 2011; Peltzer, 1999). Future studies might utilize audio computer-assisted self-interview to assess HIV risk behaviors to overcome the issue of possible underreporting of these sensitive behaviors. This sort of study design might incorporate biological measures of HIV risk including testing for HIV and other STIs to validate self-report of HIV infection as an outcome of risk behaviors. Our findings also indicate the need for future studies that explore partners' desires for pregnancy and the role of reproductive coercion including birth control sabotage among teenagers who experience interpersonal violence from intimate partners. Birth control sabotage might include partners dictating use of birth control including verbal directives from partners to refrain from birth control use, partners preventing teenagers from obtaining contraception, or other active measures to control contraception actions such as

throwing away contraceptive tools (Norton et al., 1995). Reproductive coercion, including the use of birth control sabotage, is another possible explanation for HIV risk behavior that can result in high rates of unintended pregnancy (Miller, Decker, et al., 2010; Miller, Jordan, Levenson, & Silverman, 2010; Moore, Frohwirth, & Miller, 2010; Thiel de Bocanegra, Rostovtseva, Khera, & Godhwani, 2010). However, studies examining these issues have focused primarily on adult women rather than teenagers. Finally, future studies can focus duplicating findings with larger sample sizes, which would enable us to further assess the reliability of the CDRS-R among pregnant teenagers and because our small sample size limits the generalizability of findings.

The present study indicates a strong relationship between interpersonal violence and HIV risk among this sample of pregnant teenagers. Overall, our findings are consistent with the existing literature on the relationship between interpersonal violence and HIV risk among pregnant adult women, they provide important insights. Firstly, findings suggest a need to routinely screen for history of interpersonal violence among pregnant teenagers, as such an understanding might enhance an understanding of their potential for engaging in HIV/STI risk behavior and possibly inform strategies to prevent subsequent teenage pregnancy. Secondly, findings suggest that pregnant teenagers with a history of interpersonal violence are a particularly vulnerable subset of teenagers who are at risk for HIV. This indicates the need to formulate integrated interventions that prevent interpersonal violence as well as HIV risk. A prenatal clinic may offer an ideal setting for such an intervention to take place. Finally, while findings are consistent with the literature on interpersonal violence and HIV risk among pregnant adult women, intervention approaches may not be the same in these two populations. For example, intervention approaches might incorporate understandings of child development including the importance of a family-based approach on adolescent behavior change (Ajzen, Albarracin, & Hornik, 2007). Additional research to enhance our understanding of HIV risk among this special subset of teenagers is needed to inform the design of effective intervention approaches.

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