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Partnership Concurrency Status and Condom Use among Women Diagnosed with *T. vaginalis*

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Abstract

Introduction and Background—Partner concurrency increases the risk of sexually transmitted infections (STIs) such as *T. vaginalis*. Women diagnosed with *T. vaginalis* have a two to three-fold risk of acquiring HIV/AIDS.

Goals—To describe partnership concurrency (multiple sexual partners during the same time period) and condom use among women diagnosed with *T. vaginalis*, and to compare reports of concurrency between matched female and male dyads.

Methods—A baseline interview on partnership status and condom use was administered to women diagnosed with *T. vaginalis* at a public STI clinic. A male partner sub-study was also conducted. Seventy-three dyads were matched by unique identifier and female and male responses were compared.

Results—The participants were 319 African American women and 10 white women aged 15 to 40 years (N=329). Almost three fourths (72.3%) had only one partner over a three month period, compared to more than one fourth (27.7%) with two or more partners. Regular condom use was low (16.4%), especially with regular partners (9.1%). In the matched sub-study, men reported significantly higher rates of concurrency than women (47.3% versus 23.0%; $p < 0.002$). Men who practiced concurrency were not significantly more likely than other men to use condoms with regular partners.

Conclusions—Women seldom used condoms with their regular male partners and these partners had significantly higher rates of concurrency and low rates of condom use. Women may underestimate the risk of acquiring STI from regular partners and counseling strategies should include the risk of being infected with STDs such as trichomonas by regular partners as well as by casual partners in the absence of condom use.

INTRODUCTION

Partnership status and condom use behaviors help us to understand how sexually transmitted infections (STIs) and HIV/AIDS are transmitted through sexual networks. Both lack of condom use and being in a concurrent relationship are risk factors for STI/HIV^{1, 2}. This article addresses partnership status in relation to condom use, and focuses on concurrency in assessing

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STI risk factors among women. The term concurrency is typically used to describe partnerships that are overlapping rather than sequential³, and its causes are often attributed to a gender ratio imbalance among African Americans⁴. Socioeconomic factors promoting concurrency are economic inequality, male mortality, and incarceration of men, which disproportionately affects African Americans⁵. The secrecy that accompanies concurrency can impede consistent condom use and partner notification, both standard tools for STI control^{6, 7}.

Information is lacking about condom use by dyads who describe each other as regular partners, but who differ in their reports of partnership status. Elish et al. (1996)⁸ found that dyads are likely to disagree about whether they should be defined as “regular” or “casual,” but the authors did not investigate condom use as a related topic. Gorbach et al. (2005)⁹ found that dyads engaging in concurrency are likely to disagree on the depth of commitment to each other, but also did not address the issue of condom use. Wagstaff et al. (1995)¹⁰ found that women with a single, risky partner (i.e., one who has multiple sexual partners or a history of injecting drugs) were less likely to report condom use than with multiple partners, but did not match these data with information from sexual partners. The present study sought to address this gap by addressing partnership status and condom use among women diagnosed with *Trichomonas vaginalis*, a common STI that increases HIV risk by two or threefold^{11–13}.

METHODS

Recruitment and Procedures

Interview data were analyzed for 329 women aged between 15 to 40 years who were recruited at a public STI clinic. Women who were seen for routine care at the Jefferson County Department of Health (JCDH) STD Clinic and who were diagnosed as having trichomoniasis were asked to participate in a study of different methods of partner notification. The Institutional Review Boards at The University of Alabama at Birmingham, the JCDH, and The University of Alabama (Tuscaloosa) approved the study, including all materials and consent forms. As part of this study, data were available from a baseline interview on ethnicity, relationship status, parental status, cohabitation, financial support, frequency of sex, domestic violence (an issue for partner notification), condom use with individual partners, and, finally, willingness to notify partners about exposure to *T. vaginalis*. Further, as part of this study, participants were asked to list their sexual partners over the past three months and to identify whether these partners were “regular” or “casual”. Upchurch, Brady & Reichart (1990),¹⁴ distinguished between “regular” and “casual” based on length of time with partner and frequency of sex. Using this definition, participants were asked to select one of two options: “Regular” partner was defined as a person with whom the woman had been sexually active for more than a month and had sex with on a regular basis whereas a “casual” partner was defined as one with whom the woman had occasional sex. These definitions assume core/other relationships similar to the use of “regular” and “casual” sexual partners described elsewhere for concurrency.^{1, 9} Women were asked to inform their partners not only to present themselves to the clinic for treatment of trichomonas but also to alert the nurse that they were part of the study. Both men and women were compensated for participation in the study. When the male partners presented to the clinic informed consent was obtained and they were enrolled into the study. An interview was administered which included questions regarding their sexual history and attitudes about partner notification. These male data were matched with their female partner data by a unique identifier. Thus, we were able to analyze data for all the women regarding their use of condoms with their regular and casual partner and for some of the women, examine condom usage data by their regular male partner.

Statistical Analyses

The analyses compared risk behaviors of the women by partner status (regular, casual) and frequency of sex by the X^2 or Fisher's exact probabilities test, if appropriate. Categories for condom use were collapsed for meaningful analysis. Continuous variables (age, frequency of sex) were compared by Student's t-Test. Agreement between the male and female reporting was assessed by the weighted Kappa test. A p value of <0.05 was used for statistical significance for all analyses.

RESULTS

Female Study Population

The participants consisted of 319 African Americans and 10 whites ($N=329$) with a median age of 27.1 years (mean 26.1; SD 0.55). Almost three fourths of the sample (72.3%) reported having only one partner over the past three months, with most of these partners being described as regular (76%). Over one fourth of participants (27.7%) reported having two or more partners over the past three months with one partner being the regular partner and the others defined as casual. Only 5% of women in this category had three or more partners, with the upper limit being five partners.

Women were not likely to reside with their partners (Table 1). Only one fifth (20.7%) of participants cohabited with their regular partners, and even fewer (6.9%) were married to them. Participants rarely lived with casual partners. Less than one fifth of participants (18.4%) reported having children with their regular partner, even though children were often in residence (66%). Consistent with primary status, regular partners were more likely than other men to be in residence ($p=0.001$). Partnership status was a significant factor affecting income support as well, with regular partners being more likely than other men to contribute money, food and other items to the household ($p<0.001$). However, a substantial number of casual partners (40.8%) also contributed to the household. The level of income support from all types of partners suggests that it is normative and, further, that it is not greatly influenced by cohabitation. Only 2% of participants received drugs or money for sex from regular partners, indicating that drug use or prostitution were not the basis for these relationships.

Condom Use and Partnership Status

Differences in condom use were observed when stratified by partnership status. As shown in Table 2, condom use was significantly less likely to occur with the regular partner versus the casual partner. ($p<0.001$) Additionally, frequency of sex, and frequency of unprotected sex, was more likely to occur with regular partners than with casual partners ($p<0.001$). Nevertheless, condom use was low regardless of partnership status. Few women reported being forced to have sex by their partners (3.9%); with no statistical difference occurring when stratified by partner status. Significant differences were observed using frequency of sex over last two months to differentiate between regular and casual partners, i.e., sex occurred considerably more often with regular partners compared to casual partners, even allowing for expected differences between the two categories ($p<=0.001$). Thus, the partner identified as casual represented the lower risk of STI acquisition than the regular partner based on higher rates of condom use and relatively infrequent sex.

Male Partner Sub-Sample

A total of 83 male partners presented for enrollment into the study, all of them having been referred by their female partners. Of these men, 73 (92%) were identified as regular partners by the women. These dyads largely agreed about whether they were, in fact, regular partners

(98.5% for women versus 87.7% for men). The demographics of the women whose partners were enrolled were not significantly different than the total population of women.

As shown in Table 3, condom use was again generally low, with 16.4% (12/73) of the women and 26% (19/73) of the men reporting condom use on a consistent basis. These reports by matched partners indicated moderate agreement (Weighted Kappa = 0.23 (95% CI 0.04, 0.43)

Table 4 provides further evidence of the lack of condom use among matched dyads and in relation to male concurrency. Men were significantly more likely than women to report concurrent partners (47.3% versus 23.0%; $p < 0.002$) and to have five or more partners ($p < 0.03$). Of the women reporting seldom/never condom use with regular partners, nearly half (49%) had male partners who practiced concurrency. Thirty-eight percent of these men had two to four partners, and 11% had five or more partners. Men's concurrency was thus likely to be a bridging factor for infecting regular partners with *T. vaginalis*. For the 12 women who reported consistent condom use with regular partners, 41.7% (n=15) of these partners had also engaged in concurrency.

DISCUSSION

The present study examined partnership status and condom use among over 300 women diagnosed with *T. vaginalis*, and, in a subset of these women for whom male partner data was available, compared reports of concurrency between matched female and male dyads. The main finding was that partner concurrency was high, and that the most likely source of women's exposure to *T. vaginalis* was her regular partner in terms of the frequency of sex and lack of condom use. This result is counterintuitive to messages that emphasize dyadic relationships. Several factors emerged from the main sample and the partner sub-study to suggest that women who are regular partners in heterosexual relationships are at special risk of STIs such as *T. vaginalis*. First, the large majority of participants had only one male partner, who was mostly described as regular. Second, over half of the men in the sub-study practiced concurrency, with significantly fewer women doing so. Almost one fourth of the women also reported concurrency, however, suggesting that rates of co-relationships in this population are relatively high. Third, condom use among the matched dyads was low, although the men's condom use with concurrent partners may have been higher. Fourth, intercourse with regular partners was more frequent and more recent than with casual partners by a factor of three to one.

The risks of STI/HIV through concurrency may indeed be considerable. In the mid 1990s, mathematical modeling demonstrated that concurrency increased HIV infection by a factor of 10¹⁵. Later research confirmed that each additional partner is a conduit for STI transmission¹⁶⁻¹⁹. In fact, STIs can be transmitted more rapidly through concurrency than by sequential monogamy^{3, 20}. Individual-level factors, such as a woman's desire for pregnancy²¹ and the male prerogative⁶ have been associated with both concurrency and lack of condom use. Partnership-level factors include not knowing or inquiring about partners' risks^{16, 17}, having older partners or partners with a different racial or socioeconomic background⁹, having partners from high prevalence areas for STI/HIV¹, or having abusive partners²². As we have also shown here, men are more likely than women to have concurrent partners^{2, 23}, but both men and women engaging in concurrency are likely to hide this information from each other, even when the practice is putatively normative^{6, 24}.

Condom use is critical to STI/HIV prevention in risky sexual contexts. In addition to the results presented here, research on STI risk and concurrency in the United States generally has found lower condom use with regular partners than with other types of partners^{6, 10, 24-26}. For example, Grimley et al (2004)²⁵ found that low-income African American men used condoms with one third of regular partners compared to two thirds of other types of partner. Reasons for

unprotected sex among dyads include desire for “natural” sex⁶, closeness of relationship²⁷, duration of relationship²⁸, and women’s fear of being labeled promiscuous if they ask about condom use²⁹. Condom use with casual partners may be more acceptable because of the perceived risks of these partners⁶. However, the consensus of most U.S. research on the topic is that condom use is low with all types of partners^{30–32}.

The limitations of the study should be noted. First, reporting bias may have affected participants’ responses for behavior that is socially sensitive, and may help to explain the gender differences in reports on condom use and concurrency³³. In particular, socially desirable reporting makes it possible that respondents overstated condom use when asked by health providers. However, as noted, the literature on concurrency and STI risk has also found higher rates of concurrent relationships among men. Second, the relatively small number of dyads in the partner sub-study could affect our results and may not be generalizable to other populations. Several studies have found concurrency to be higher among women than is reported here^{1,4}, although rates vary by population, infection status, and geographic location.

STI prevention messages often warn against having unprotected sex with multiple partners. Such messages have identified special risks for African American women, especially in relation to HIV/AIDS³⁴. Based on the results of our study, women should be advised that the risk of acquiring STI in the absence of condom use may extend to the regular partner as well as to casual partners. Further research should establish whether our results can be generalized to larger populations, including to diverse ethnic groups, and whether regular, unprotected sex with an infected partner is indeed as risky for STI transmission as suggested here.

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Table 1
 Marriage, cohabitation, parenting, and income support stratified by partnership status* (n=329 women)

	Regular Male Partners (n=320) No. (%)	Casual Male Partners (n=98) No. (%)	<i>p</i>
Married to partner			
Yes	22 (6.9)	2 (2.0)	
No	298 (93.1)	96 (98.0)	0.08
Live with partner			
Yes	66 (20.7)	1 (1.0)	
No	253 (79.3)	96 (99.0)	<0.001
Has children with partner			
Yes	59 (18.4)	7 (7.1)	
No	261 (81.6)	91 (92.9)	0.006
Partner helps with money, food etc.			
Yes	214 (66.9)	40 (40.8)	
No	106 (33.1)	58 (59.2)	<0.001
Partner gives drugs or money for sex			
Yes	6 (1.9)	4 (4.1)	
No	314 (98.1)	93 (95.9)	0.25

* Some data missing due to incomplete subject responses to questions

Table 2
 Condom use, forced sex, and frequency of sex stratified by partnership status *
 (n=329 women)

	Regular Male Partners (n=320) No. (%)	Casual Male Partners (n=98) No. (%)	<i>p</i>
Condom use over last two months			
Never	181 (56.9)	41 (41.8)	<0.001
Seldom	39 (12.3)	8 (8.2)	
Half the time	36 (11.3)	10 (10.2)	
Most of the time	33 (10.4)	12 (12.2)	
Always	29 (9.1)	27 (27.6)	
Forced to have sex with partner			
Yes	9 (2.8)	4 (4.1)	0.51
No	311 (97.2)	94 (95.9)	
No. of times had vaginal sex in last two months	8.96 (10.9)	2.64 (3.80)	<0.001

* some data missing due to incomplete subject responses to questions

Table 3
Relationship between condom use reports by matched partners (n=73 dyads)

	Condom use (with all partners) as reported by female index cases' regular male partners*		
	Never (No. %)	Half the time (No. %)	Most times/always (No. %)
Condom use with regular male partners as reported by female index cases			
Seldom/Never	29 (85.3)	15 (75.0)	11 (57.9)
Half of the time	1 (2.9)	4 (20.0)	1 (5.3)
Most times/Always	4 (11.8)	1 (5.0)	7 (36.8)
Total	34 (100.0)	20 (100.0)	19 (100.0)

Weighted kappa 0.23 (95% CI 0.04, 0.43) p= 0.0246

* Index case is the woman initially identified with trichomonas and enrolled into the study

Table 4

Relationship between condom use and male concurrency in matched sample (n=73 dyads)

Number of sexual partners in the past 3 months reported by regular male partners of female index cases*

	One (No. %)	Two-Four (No. %)	Five or More (No. %)
Condom use reported by female index cases			
Seldom/never	28 (77.8)	21 (72.4)	6 (75.0)
Half of the time	1 (2.8)	5 (17.2)	0 (0.0)
Most times/Always	7 (19.4)	3 (10.4)	2 (25.0)
Total	36 (100.0)	29 (100.0)	8 (100.0)

Weighted Kappa 0.06 (95% CI-0.12, 0.24) p= 0.91

* Index case is the woman initially identified with trichomonas and enrolled into the study